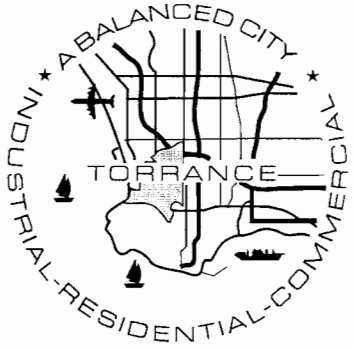
PROJECT MANUAL FOR PUEBLO PARK IMPROVEMENTS

B 2014-22



APRIL 2014

TABLE OF CONTENTS

		Page No.
A.	**NOTICE INVITING BIDS**	3
B.	**INSTRUCTIONS TO BIDDERS**	6
C.	**GENERAL PROVISIONS**	14
D.	**BID DOCUMENTS** Bidder's Proposal Addenda Acknowledgment Contractor's Affidavit Bid Bond (10% of Bid) List of Subcontractors References Bidder's Information	26
E.	**DOCUMENTS TO BE COMPLETED AND DELIVERED TO THE CITY AS PART OF CONTRACT WITH CITY** Performance Bond (100% of Bid) Labor and Material Bond (100% of Bid) Workers' Compensation Insurance Certificate Contract - Public Works Agreement	37
F.	**WAGE DETERMINATIONS**	54
G.	**PROJECT SPECIFICATIONS**	80

PART A

NOTICE INVITING BIDS

CITY OF TORRANCE
CALIFORNIA

NOTICE INVITING BIDS

Notice is hereby given that sealed proposals for performing the following described work will be received at the office of the City Clerk of the City of Torrance, California, until **3:00 p.m. on Wednesday, May 14, 2014** after which time they will be publicly opened and read at 3:15 p.m. in the Council Chambers of said City:

Bid for Pueblo Park Improvements
B2014-22

Plans, Bid Proposal (for reference only) and Specifications are available for viewing and printing from the City's website at http://www.torranceca.gov/25079.htm.

There will be a mandatory pre-bid conference held on Tuesday, April 22, 2014 at 10:00 a.m. commencing at the Pueblo Park, 2252 Del Amo Boulevard Torrance, CA 90501. The City of Torrance will consider the bidder as non-responsive if the bidder does not attend the mandatory pre-bid conference. **Addenda will be issued only by email and only to those attended the mandatory pre-bid conference.** All addenda must be acknowledged. Failure to acknowledge addenda on the bid forms provided may render the proposal non-responsive and cause it to be rejected.

Full-size 24" x 36" set of Plans and a bound Specifications booklet may also be obtained at the Office of the City Clerk (310) 618-2870, City Hall, 3031 Torrance Boulevard, Torrance, California upon payment of $35 if picked up at City Hall, or payment of $45 if requested by mail. Both amounts are non-refundable.

If requesting any item(s) by mail, please send check to the following:

CITY OF TORRANCE
OFFICE OF THE CITY CLERK
3031 TORRANCE BLVD
TORRANCE, CA 90503-2970
ATTN: B2014-22

The engineer's estimate is $ 475,000- $ 505,000. The work shall be completed within one hundred twenty (120) calendar days of receipt of the Notice to Proceed (NTP). Bids are required for the entire work described herein.

The City has determined the bidder must have a valid "B" General Contracting License or valid "A" Engineering License. Bidder must have at least five (5) years experience in public works projects of a similar size and scope.

Per Division 2, Chapter 2 of the Torrance Municipal Code, the Torrance City Council may reject any and all bids, waive any informality or irregularity in such bids, and determine the lowest responsible bidder.

No Facsimile Bids shall be accepted by the City.

Project is subject to Prevailing Wage.

By order of the City Council of the City of Torrance, California.

Bidders with pre-bid inquiries should contact Diane Megerdichian, Sr.Business Manager, General Services Department at 310-781-7151 or email dmegerdichian@torranceca.gov. If emailing questions, please put project title in the subject line.

PART B

INSTRUCTIONS TO BIDDERS

CITY OF TORRANCE
CALIFORNIA

INSTRUCTIONS TO BIDDERS

A. QUALIFICATION OF BIDDERS

1. Competency of Bidders

The Bidder shall be thoroughly competent and capable of satisfactorily performing the Work covered by the Bid. As specified in the Bid Documents, the Bidder shall furnish statements of previous experience on similar work. When requested, the Bidder shall also furnish a plan of procedure proposed; organization, machinery, plant and other equipment available for the Work; evidence of financial condition and resources; and any other documentation as may be required by the City to determine if the Bidder is responsible.

2. Contractor's License

At the time of submitting the Bid, the Bidder shall be licensed as a contractor in accordance with the provisions of Chapter 9, Division 3, of the California Business and Professions Code. The required prime contractor license class for the Work is shown in the project Notice Inviting Bids. However, the City reserves the right to award the Contract to a contractor with another class if the City determines that the license is proper for the work.

B. BIDDER RESPONSIBILITY

A responsible Bidder is a Bidder who has demonstrated the attribute of trustworthiness, as well as ability, fitness, capacity and experience to satisfactorily perform the work.

Bidders are notified that, in accordance with Division 2, Chapter 2 of the Torrance Municipal Code, the City Council may determine whether the Bidder is responsible based on a review of the Bidder's performance on other contracts.

If, based on the provision and criteria in Division 2, Chapter 2 of the Torrance Municipal Code, the General Services Director proposes not to recommend the award of contract to the apparent low bidder, the Director shall notify the Bidder in writing of its intention to recommend to the City Council that the Council award the contract to the next lowest responsible bidder. If the Bidder presents evidence in rebuttal to the recommendation, the Director shall evaluate the merits of such evidence, and based on that evaluation, make a recommendation to the City Council.

C. ADDENDA TO THE CONTRACT DOCUMENTS

The City reserves the right to revise or amend these specifications prior to the date set for opening bids. Revisions and amendments, if any, will be announced by an addendum to this bid. If the revisions require additional time to enable Bidders to respond, the City may postpone the opening date accordingly. In such case, the addendum will include an announcement of the new opening date.

All addenda must be attached to the bid. Failure to attach any addendum may render the bid non-responsive and cause it to be rejected.

D. PREPARATION OF THE BID

1. Examination of Site, Plans and Specifications

Bidders shall examine the site of the work and acquaint themselves with all conditions affecting the work. By submitting a bid, the bidder shall be held to have personally examined the site and the drawings, to have carefully read the specifications, and to have satisfied itself as to its ability to meet all the difficulties attending the execution of the proposed contract before the delivery of this proposal, and agrees that if awarded the contract, will make no claim against the City based on ignorance or misunderstanding of the plans, specifications, site conditions and/or contract provisions.

The Contractor shall have included in the contract price a sufficient sum to cover all items, including labor, materials, tools, equipment and incidentals, that are implied or required for the complete improvements as contemplated by the drawings, specifications, and other contract documents.

2. Bid Instructions and Submissions

The Bid shall be submitted on the Bid Proposal forms included in the Specifications. All Bid Documents must be completed, executed and submitted with Bid by Bidder. Required nine (9) Bid Proposal Documents:

1. Bidder's Proposal
2. Addenda Acknowledgment
3. Contractor's Affidavit
4. Bid Bond (10% of Bid)
5. List of Subcontractors
6. Bidder's References/Experience (2 pages)
7. Bidder's Information (2 pages)

All prices submitted will be considered as including any and all sales or use taxes.

E. BID FORM/BOND

The Bid must be accompanied by cash, a certified or cashier's check, or a surety bond (bid bond) payable to the City of Torrance. Bids must be submitted on the proposal forms furnished by the City Clerk's office. The Bid Guaranty shall be in an amount equivalent to at least 10% of the Total Contract Bid Price.

Within ten (l0) days after the award of the contract, the City Clerk will return the proposal guarantees accompanying those proposals, which are not to be considered in making the award. All other proposal guarantees will be held until the contract has been finally executed, after which they will be returned to the respective bidders whose proposals they accompany.

F. AFFIDAVIT.

An affidavit form is enclosed. It must be completed signifying that the bid is genuine and not collusive or made in the interest or on behalf of any person not named in the bid, that the bid has not directly or indirectly induced or solicited any other Bidder to put in a sham bid or any other person, firm, or corporation to refrain from bidding, and that the Bidder has not in any manner sought by collusion to secure for itself an advantage over any other Bidder. Any bid submitted without an affidavit or in violation of this requirement will be rejected.

G. NONRESPONSIVE BIDS AND BID REJECTION

1. A Bid in which any one (1) of the required eight (8) Bid proposal documents are not completed, executed and submitted may be considered non-responsive and be rejected.

2. A Bid in which the Contract Unit Prices are unbalanced, which is incomplete or which shows alteration of form or irregularities of any kind, or which contains any additions or conditional or alternate Bids that are not called for, may be considered non-responsive and be rejected.

H. AWARD OF CONTRACT

In accordance with Division 2, Chapter 2 of the Torrance Municipal Code, the City Council reserves the right to reject any and all bids received, to take all bids under advisement for a period not-to-exceed sixty (60) days after date of opening thereof, to waive any informality or irregularity in the Bid, and to be the sole judge of the merits of material included in the respective bids received. This bid does not commit the City to award a contract or to pay any cost incurred in the preparation of a bid. All responses to this bid become the property of the City of Torrance.

I. EXECUTION OF CONTRACT

After the Contract is awarded, the awarded bidder shall execute the following six (6) documents:

1. Performance Bond (100% of Bid)
2. Labor and Material Bond (100% of Bid)
3. Contract - Public Works Agreement
4. Verification of Insurance Coverage (Certificates and Endorsements)
5. Workers' Compensation Insurance Certificate
6. Business License Application Form

J. PERMITS, LICENSES AND PUBLIC WORKS AGREEMENT

The Contractor shall procure and execute all permits, licenses, pay all charges and fees, and give all notices necessary and incidental to completion of Work. The Contractor shall execute a Public Works Agreement. No fee is charged for a permits issued by the City of Torrance Building and Safety Department for a public works project. The Contractor shall obtain a City of Torrance Business License. To obtain a Torrance Business License please call 310-618-5923.

K. INSURANCE

The Contractor shall maintain Automobile Liability, General Liability and Workers' Compensation Insurance as specified in the Public Works Agreement included in the Project Specifications. The contractor must include all subcontractors as insured under its policies or must furnish separate certificates and endorsements for each subcontractor. All coverage for subcontractors will be subject to all of the insurance requirements.

L. SUBCONTRACTS

Each Bidder shall comply with the Chapter of the Public Contract Code including sections 4100 through 4113. The Contractor shall perform, with its own organization, Contract work amounting to at least 50 percent of the Contract price. When a portion of an item is subcontracted, the value of the work subcontracted will be based on the estimated percentage of the Contract Unit Price, determined from information submitted by the Contractor, subject to approval by the City Manager.

M. TRAFFIC CONTROL PLAN

Not applicable

N. PRE-BID INQUIRIES

Bidders with pre-bid inquiries should contact Diane Megerdichian, Sr. Business Manager, General Services Department at 310-781-7151 or email dmegerdichian@torranceca.gov. If emailing, please put project title in the subject line.

DO NOT RETURN PLANS AND SPECIFICATIONS.

ALL BIDS MUST BE SEALED AND MARKED:

"BID FOR PUEBLO PARK IMPROVEMENTS, B2014 -22 "

O. EXECUTION OF CONTRACT

1. The contract shall be signed by the successful bidder and returned, together with the contract bonds and evidence of required insurance coverage, **within ten (10) working days**, not including Sundays, after the bidder has received notice that the contract has been awarded. Failure to execute the contract as specified above shall be just cause for annulment of the award and forfeiture of the proposal

guarantee. The Contract shall not be considered binding upon the CITY until executed by the authorized CITY officials.

2. Bond amounts shall be as provided in Section 2-4 of the Standard Specifications for Public Works Construction. The Performance Bond shall be required to remain in effect for one (1) year following the date specified in the City's Notice of Completion, or, if no Notice of Completion is recorded for one (1) year following the date of final acceptance by the City Manager.

P. INSURANCE REQUIREMENTS FOR CONTRACTORS.
Please refer to the attached Public Works Agreement for insurance requirements.

Q. RESPONSIBILITY OF CITY.
The City of Torrance shall not be held responsible for the care or protection of any material or parts of the work prior to final acceptance, except as expressly provided in these specifications.

R. CONSTRUCTION SCHEDULE AND PRECONSTRUCTION CONFERENCE.

The office staff of the City is currently operating on a 9/80 work week; therefore, City Hall is closed every other Friday.

In accordance with the herein Special Provisions, after notification of award and prior to start of any work, **the Contractor shall submit to the City Manager for approval its proposed Construction Schedule within ten (10) working days from the date of Notice of Proceed.** At least two (2) days, exclusive of Saturdays, Sundays and holidays, prior to commencement of work, the Contractor shall attend a pre-construction conference.

The Contractor will provide all product and equipment submittals to the City of Torrance or designated consultant within ten (10) working days from the date of Notice to Proceed. The Contractor shall immediately order materials requiring a delivery delay upon receipt of a written notice from the City that the City Council has approved an Award of Contract. Contractor shall provide written proof(s) of timely material order(s) and shall include any delivery delays in the Construction Schedule.

S. PROGRESS OF THE WORK AND TIME FOR COMPLETION

The Contractor shall begin work after the mailing, from the City Manager to the Contractor, by first class mail, postage prepaid, of a Notice to Proceed. **The Contractor shall diligently prosecute the same to completion within one hundred twenty (120) calendar days of the start date specified in said Notice.** The one hundred twenty calendar day schedule includes, completion of contractual paper work, equipment/ material submittal review, the lead time for materials and equipment, and on site work.

During periods when weather or other conditions are unfavorable for construction, the Contractor shall pursue only such portions of the work as shall not be damaged thereby. No portions of the work whose acceptable quality or efficiency will be affected by any unfavorable conditions shall be constructed while those conditions exist. It is expressly understood and agreed by and between the Contractor and the City that the Contract

time for completion of the work described herein is a reasonable time taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the work.

T. LIQUIDATED DAMAGES

The Contractor agrees that failure to complete work within the time allowed will result in damages being sustained by the City. Contractor and City agree that failure to complete the project will result in inconvenience to the citizens of Torrance and the City of Torrance and their customers using the affected areas. Such delay will also result in the necessity of several inspections each day to ensure that the project is properly progressing. The parties also agree that failure to complete the project on time will prevent the City from having the use of the facility. Therefore, the parties agree such damages among others are, and will continue to be, impracticable and extremely difficult to determine, but that Five Hundred Dollars ($ 500) a calendar day is the minimum value of such costs to the City and is a reasonable amount that the Contractor agrees to reimburse the City for each calendar day of delay in finishing the work in excess of the time specified for completion, plus any authorized time extensions.

Execution of the contract under these specifications shall constitute agreement by the Contractor and the City that Five Hundred Dollars ($500) per calendar day is the minimum value of the costs and actual damage caused by failure of the Contractor to complete the work within the allotted time, that such sum is liquidated damages and shall not be construed as a penalty, and that such sum may be deducted from payments due the Contractor if such delay occurs. Said amount may be reduced by the City if work is sufficiently completed within the allotted time so that the damages are minimized.

The Contractor will not be assessed liquidated damages for any delay in completion of the work when such delay was caused by the failure of the City or the owner of a utility to provide for removal or relocation of the existing utility facilities; provided, however, that the Contractor shall have given the City and the owner of a utility timely notice of the interference. "Timely notice" shall be defined as a verbal notice (to be followed up in writing) no later than one (1) hour after initial discovery of the interference unless the City Representative is present, in which case notice shall be given immediately in writing to the City Manager.

U. GENERAL PREVAILING WAGE RATE

Pursuant to Section 1770 et seq. of the California Labor Code, the minimum prevailing rate of per diem wages for each craft, classification, or type of workman needed to execute the Contract shall be those determined by the Director of Industrial Relations of the State of California. These wages are set forth in the General Prevailing Wage Rates for this project, and available from the California Department of Industrial Relations' internet site at http://www.dir.ca.gov and included as part of the project manual.

APPRENTICESHIP EMPLOYMENT STANDARDS. Attention is directed to the provisions in Sections 1776, 1777.5 and 1777.6 of the California Labor Code concerning the employment of apprentices by the Contractor or any subcontractor under them.

Information relative to apprenticeship standards, wage schedules, and other requirements may be obtained from the Director of Industrial Relations, ex officio the

Administrator of Apprenticeship, San Francisco, California, or from the division of Apprenticeship Standards and its branch offices.

V. PRELIMINARY NOTICES

Preliminary Notices should be mailed to the following address.

Diane Megerdichian
General Services Department
3350 Civic Center Drive
Torrance, CA 90503

W. NOTICE OF INTENT TO AWARD:

Approximately two (2) weeks prior to the anticipated City Council meeting awarding a contract/purchase order as a result of this Notice Inviting Bids, the City will notify all bidder's of its intent to award. Results will be posted on the City of Torrance Web site http://www.torranceca.gov/PDF/Recommendation_to_Award_Notification.pdf

X. BID/RFP PROTEST PROCEDURES:

The City of Torrance Bid/RFP Protest Procedures may be found on the City of Torrance Web site:
http://www.torranceca.gov/PDF/Bid_RFP_Protest_Procedures.pdf

PART B

GENERAL PROVISIONS

CITY OF TORRANCE, CALIFORNIA
B. General Provisions

Bid for Pueblo Park Improvements
B 2014-22

	PAGE NO.
DIVISION I. PROJECT SPECIFICATIONS	16
SECTION A. GENERAL	
SECTION B. REFERENCE TO STANDARDS OR PUBLICATIONS	
DIVISION II. SPECIAL PROVISIONS	
SECTION A. DESCRIPTION OF THE WORK	17
1. Scope of the Work	
SECTION B. GENERAL PROCEDURES	17
1. Specifications and Drawings Complementary	
2. Order of Precedence of Contract Documents	
3. Discrepancies in the Contract Documents	
4. Errors and Omissions	
5. Changed Conditions	
6. As-built Drawings	
7. Construction Staking	
8. Notice to Proceed	
9. Delay in Obtaining Materials	
10. Inspection and Testing	
11. Project Schedule	
12. Mobilization	
13. Markup	
14. Utilities	
15. Completion, Acceptance and Warranty	
16. Contractor Representative	
17. Waste Management Plan	
SECTION C. PAYMENTS TO CONTRACTOR AND CLAIMS	23
1. Breakdown of Contract Prices	
2. Payment for Labor and Materials	
3. Additional Work	
4. Claims	
5. Noncompliance with Plans and Specifications	
6. Request for Payment	

DIVISION I. PROJECT SPECIFICATIONS

SECTION A. GENERAL

The Project Specifications for all work on this project are the specifications contained in the "**Project Manual for Pueblo Park Improvements**", prepared by Land Concern Ltd. and the City of Torrance.

These Specifications are intended to govern all aspects of the appurtenant construction including, but not limited to, materials, methods and details, except as modified herein or as inconsistent with the provisions hereof.

DEFINITIONS

Whenever the following terms are used, they shall be understood to mean and refer to the following:

Agency or City - City of Torrance.

Board- The City Council of the City of Torrance herein referred to as City Council.

City Manager - The City Manager of the City of Torrance, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

Consulting Architect – Philip Stevens
Land Concern
1750 E. Deere Avenue
Santa Ana, CA 92705
949-333-6310
pstevens@landconcern.com

Laboratory - The designated laboratory authorized by the City of Torrance to test materials and work involved in the contract.

SECTION B. REFERENCE TO STANDARDS OR PUBLICATIONS

Any reference made in the Contract Documents to any specification, standard, or publication of any organization shall, in the absence of a specific designation to the contrary, be understood to refer to the latest edition of the specification, standard, or publication in effect as of the date of advertising the work, except to the extent that said standard or publication may be in conflict with applicable laws, ordinances, or governing codes. Contractors should be aware of all new code requirements (such as Cal-Green) when dealing with HVAC and other general building work. No requirements of these specifications or the drawings shall be waived because of any provisions of, or omission from, said standards or publications.

DIVISION II. SPECIAL PROVISIONS

SECTION A. DESCRIPTION OF THE WORK

1. Scope of the Work. The work to be done consists of furnishing all labor, materials, tools, equipment and incidentals to complete the Pueblo Park Improvements as shown in the plans and specifications prepared by Land Concern Ltd for the City of Torrance.

SECTION B. GENERAL PROCEDURES

1. Specifications and Drawings Complementary. The Specifications and Drawings are complementary, and what is called for in one shall be as binding as if called for in both.

2. Order of Precedence of Contract Documents. In resolving conflicts resulting from conflicts, errors, or discrepancies in any of the Contract Documents, the order of precedence shall be as follows:

   a. Change Orders (Including Plans and Specifications attached thereto).
   b. Public Works Agreement
   c. Addenda
   d. Special Provisions
   e. Plans
   f. Standard Plans
   g. Instructions to Bidders
   h. Standard Specifications

   Within the Specifications the order of precedence is as follows:

   a. Addenda/Change Orders
   b. Permits from other agencies/supplemental agreements
   c. Special Provisions
   d. Instructions to Bidders
   e. Referenced Standard Drawings
   f. Referenced Standard Specifications

   With reference to the Drawings the order of precedence is as follows:
   a. Change Orders drawings govern over Addenda and Contract Drawings
   b. Addenda drawings govern over Contract drawings
   c. Contract drawings govern over shop drawings and standard drawings
   d. Detail drawings govern over general drawings
   e. Figures govern over scaled dimensions

   If the Contractor, in the course of the Work, becomes aware of any claimed errors or omissions in the Contract Documents or in the CITY's fieldwork, the Contractor shall immediately inform the CITY. The CITY shall promptly review the matter, and if the CITY finds an error or omission has been made the CITY shall determine the corrective actions and advise the Contractor accordingly. If the corrective work associated with an error or omission increases or decreases the amount of work called for in the Contract, the CITY shall issue an appropriate Change Order in accordance with 3-3. After discovery of an error or omission by the Contractor, any related work performed by the Contractor shall be done at the Contractor's risk unless authorized by the CITY.

3. Discrepancies in the Contract Documents. Any discrepancies, conflicts, errors or omissions found in the Contract Documents shall be promptly reported in writing to the City Manager, who will issue a correction in writing. The Contractor shall not take advantage of any such discrepancies, conflicts, errors or omissions, but shall comply with any corrective measures regarding the same prescribed by the City Manager, and no additional payment or time shall be allowed therefor.

   If discrepancies are discovered between the drawings and the specifications, and no specific interpretation is issued prior to bidding, the decision regarding this interpretation shall rest with the City Manager. The Contractor shall be compelled to act on the City Manager's decision as directed. In the event the installation is not in compliance with the direction of the City Manager, the installation shall be corrected by and at the expense of the Contractor at no additional cost to the City.

   See Section C of these Special Provisions for "Claims".

4. Errors and Omissions. If the Contractor, in the course of the work, becomes aware of any claimed errors or omissions in the contract documents or in the City's field work, he shall immediately inform the City Manager. The City Manager shall promptly review the matter, and if the City Manager finds an error or omission has been made the City Manager shall determine the corrective actions and advise the Contractor accordingly. If the corrective work associated with an error or omission increases or decreases the amount of work called for in the Contract, the City shall issue an appropriate Change Order. After discovery of an error or omission by the Contractor, any related work performed by the Contractor shall be done at its risk unless authorized by the City Manager.

5. Changed Conditions. The plans for the work show conditions as they are believed by the City Manager to exist, but it is not intended or to be inferred that the conditions as shown thereon constitute a representation by the City that such conditions are actually existent, nor shall the City be liable for any loss sustained by the Contractor as a result of any variance of the conditions as shown on the plans and the actual conditions revealed during the progress of the work or otherwise. The word "conditions" as used in this paragraph includes, but is not limited to, site conditions, both surface and subsurface.

   The Contractor shall examine the site, compare it with the drawings and specifications and shall satisfy itself as to the conditions under which the work is to be performed. The Contractor shall ascertain and check the location of all existing structures, utilities and equipment, which may affect its work. The Contractor shall be responsible to re-examine the site, as necessary, for performance of change orders or other proposed changes, which may affect its work. No allowance shall subsequently be made on the Contractor's behalf for any extra expense or loss of time, which is incurred due to failure or negligence on its part to make such examination.

6. As-built Drawings. The Contractor shall maintain a control set of Plans and Specifications on the Work site at all times. All final locations determined in the field, and any deviations from the Plans and Specifications, shall be marked in red on this control set to show as-built conditions. Upon completion of the Work, the Contractor shall submit the control set to the Engineer for approval. Final payment will not be made until this requirement is met.

7. Construction Staking. The Contractor is responsible for all construction staking and shall be responsible for the cost of any restaking required due to disturbance caused by its operations, failure to protect the work site from vandalism or other causes of loss.

8. Notice to Proceed. Notwithstanding any other provisions of the Contract, the Contractor shall not be obligated to perform any work and the City shall not be obligated to accept or pay for any work performed by the Contractor prior to delivery of a Notice to Proceed. The City's knowledge of work being performed prior to delivery of the Notice to Proceed shall not obligate the City to accept or pay for such work. The Contractor shall provide all required contract bonds and evidences of insurance prior to commencing work at the site.

9. Delay in Obtaining Materials. No extension of time will be granted for a delay caused by the inability to obtain materials unless the Contractor either obtains advance written approval from the City Manager or obtains from the supplier and furnishes to the City Manager documentary proof that such materials could not be obtained due to war, government regulations, labor disputes, strikes, fires, floods, adverse weather necessitating the cessation of work, or other similar action of the elements. The Contractor is required to order materials in a timely manner as specified in the "Instruction to Bidders".

10. Inspection and Testing. The Work is subject to inspection and approval by the CITY. The Contractor shall notify the CITY a minimum of 48 hours in advance of the required inspection.

    The CITY will make, or have made, such inspections and tests, as he deems necessary to see that the Work is in conformance with the Contract Documents. In the event such inspections or tests reveal noncompliance with the Contract Documents, the Contractor shall bear the cost of such corrective measures as deemed necessary by the CITY, as well as the cost of subsequent re-inspection and re-testing.

    Work done in the absence of inspection by the CITY may be required to be removed and replaced under the inspection of the CITY, and the entire cost of removal and replacement, including the cost of all materials which may be furnished by the CITY and used in the work thus removed, shall be borne by the Contractor, regardless of whether the work removed is found to be defective or not. Work covered without the approval of the CITY shall, if so directed, be uncovered to the extent required by the CITY, and the Contractor shall similarly bear the entire cost of performing all the work and furnishing all the materials necessary for the removal of the covering and its subsequent replacement, including all costs for additional inspection.

    The CITY and any authorized representatives shall at all times have access to the Work during its construction at shops and yards as well as the Work site. The Contractor shall provide every reasonable facility for ascertaining that the materials and workmanship are in accordance with the Contract Documents.

    Inspection of the Work shall not relieve the Contractor of the obligation to fulfill all conditions of the Contract.

11. Project Schedule

12.1 The Contractor shall submit a Construction Schedule in accordance with the project manual to the City Manager prior to beginning construction. No work may be started until the Schedule has been approved in writing. The work shall be scheduled to assure that construction will be completed within the specified time. The Contractor shall be responsible for coordination of all phases of the operation so that the time schedule can be met.

12.2 If the Contractor desires to make a major change in its method or operations after commencing construction or if their Schedule fails to reflect the actual progress, the Contractor shall submit to the City Manager a revised Construction Schedule in advance of beginning revised operations.

12. Mobilization

13.1 Scope. Mobilization shall include the provision of the Construction Schedule; site review; obtaining all permits, insurance, and bonds; moving onto the site all plant and equipment; furnishing and erecting plants, temporary buildings, and other construction facilities, and removal of same at completion of the project; all as required for the proper performance and completion of the work.

Mobilization shall include, but not be limited to, the following principle items.

(a) Submittal and modification, as required, of the Construction Schedule.

(b) All associated documentation and submittals required by Exhibit A of the contract.

(c) Installing temporary construction power and wiring.

(d) Establishing fire protection system.

(e) Developing construction water supply.

(f) Providing on-site sanitary facilities and portable water facilities, as required.

(g) Arranging for and erection of Contractor's work and storage yard.

(h) Submittal of all required insurance certificates and bonds, including subcontractors.

(i) Obtaining all required permits.

(j) Posting all OSHA required notices and establishment of safety programs.

(k) Have the Contractor's superintendent at the job site full-time.

(l) Pot-holing and other research and review as necessary to verify site conditions and utility locations, including research and review as necessary for change orders.

(m) Demobilization.

13. Markup. The following percentages shall apply for additional work:

Profit	5% maximum
Overhead	5% maximum

The markups mentioned hereinafter shall include, but are not limited to, all costs for the services of superintendents, project managers, timekeepers and other personnel not working directly on the change order, and pickup or yard trucks used by the above personnel, and other vehicles and/or equipment present at the jobsite but not directly used in actual construction activities. Incidental movements of labor, materials, supplies or equipment shall not be considered as use in actual construction activities. These costs shall not be reported as labor or equipment elsewhere, except when actually performing work directly on the change order and then shall only be reported at the labor classification of the work performed.

The City shall not pay for the cost of foremen or a superintendent unless authorized in advance by the City Manager. To the sum of the costs and markups provided for in this subsection, one (1) percent shall be added as compensation for bonding.

14. Utilities

The Contractor shall provide coordination with all the utility companies involved and shall provide protection from damage to their facilities. The Contractor shall be responsible for repair or replacement to said facilities made necessary by its failure to provide required protection. The Contractor is required to include utility requirements in the Construction Schedule.

The Contractor shall be solely responsible to check all utility record maps, books, and/or other data in the possession of the CITY, other agencies, and/or all utility companies, and no allowance shall be made for any failure to have done so.

The Contractor shall utilize the services of "Underground Service Alert - Southern California" for utility locating in all public right-of-ways by calling 1-800-227-2600 at least 48 hours prior to any excavation.

15. Completion, Acceptance and Warranty

If, in the CITY's judgment, the Work has been completed and is ready for acceptance, the CITY will so certify and will determine the date when the Work was completed. This will be the date when the Contractor is relieved from responsibility to protect the Work. The CITY may cause a Notice of Completion to be filed and recorded with the Los Angeles County Recorder's Office. At the CITY's option, the CITY may certify acceptance to the City Council who may then cause a Notice of Completion to be filed and recorded with the Los Angeles County Recorder's Office.

Manufacturer's warranties and guaranties furnished for materials used in the Work and instruction sheets and parts listed supplied with materials shall be delivered to the CITY prior to acceptance of the Work.

The duration of the warranty or guaranty shall be the standard of the industry with a minimum of 1 year from the date of Notice of Completion or Date of Acceptance. The prime contractor will be required to warranty the entire project regardless of whether warranties from subcontractors are also required. Coordination and correction of any issue related to project scope that arises during that one (1) year warranty period will be the responsibility of the prime contractor.

Manufacturer's warranties shall not relieve the Contractor of liability under these Specifications. Such warranties only shall supplement the Contractor's responsibility.

The CITY may require a manufacturer's warranty on any product offered for use.

16. Contractor's Representative

The Contractor's Representative shall be approved by the CITY prior to the start of the Work. If the designated representative is rejected, the Contractor shall immediately designate another representative in writing and submit to the City for consideration. The CITY shall have the authority to require the Contractor to remove its representative and/or alternate representative at any time and at no cost to the CITY.

17. Requirements for Recycling Construction Materials

The City of Torrance requires that all demolition projects and construction or remodeling projects valued at $100,000 or more must recycle or reuse at least 50% of the materials that leave the project site and 100% of excavated soil and land-clearing debris. A Waste Management Plan (WMP) form is part of the permit process for projects that meet these criteria. The WMP form is available at the permit counter or a downloadable form is available here:

http://www.torranceca.gov/PDF/WMPFormRevised2012onestop.pdf

Step 1 - when applying for the permit, you must complete the WMP form stating that at least 50% of the waste generated by the project will be recycled or reused and that 100% of excavated soil and land-clearing debris will be recycled or reused.

Step 2 - collect and keep all receipts and records of the disposal, recycling, donations, and reuse of the materials from your project. Receipts must show material type, tonnage or weight, how the materials were treated, the facility used, and the address of the jobsite.

Step 3 - complete the WMP by attaching the receipts listing the actual disposal and recycling that occurred and submitting the WMP to Public Works for approval. This is required before your project can get its final inspection.

Failure to fulfill the requirements of the WMP process will result in penalties of $5,000 for construction projects and $10,000 for demolition projects, as per the Torrance Municipal Code.

For additional information concerning recycling or recycling facilities please visit the City of Torrance Public Works Department website at http://www.torranceca.gov/8614.htm

SECTION C. PAYMENTS TO CONTRACTOR AND CLAIMS

1. Breakdown of Contract Prices. The Contractor shall, within ten (10) working days of receipt of a request from the City, submit a complete breakdown of lump sum bid prices showing the value assigned to each part of the work, including an allowance for profit and overhead. In submitting the breakdown, the Contractor certifies that it is not unbalanced and that the value assigned to each part of the work represents its estimate of the actual cost, including profit and overhead, of performing that part of the work. The breakdown shall be sufficiently detailed to permit its use by the City Manager as one of the bases for evaluating requests for payment. No extra costs shall be allowed for these breakdowns.

2. Payment for Labor and Materials. The Contractor shall pay and cause the subcontractors to pay any and all accounts for labor, including Worker's Compensation premiums, State Unemployment and Federal Social Security payments and all other wage and salary deductions required by law. The Contractor also shall pay and cause the subcontractors to pay any and all accounts for services, equipment and materials used by it and the subcontractors during the performance of work under this contract. All such accounts shall be paid as they become due and payable. If requested by the City Manager, the Contractor shall immediately furnish the City with proof of payment of such accounts. Please see Exhibit A of the Public Works Agreement for further contract requirements.

3. Additional Work. Payment for additional work and all expenditures in excess of the bid amount must be authorized in writing by the City Manager. Such authorization shall be obtained by the Contractor prior to engaging in additional work. It shall be the Contractor's sole responsibility to obtain written approval from the City Manager for any change(s) in material or in the work proposed by suppliers or subcontractors. No payment shall be made to the Contractor for additional work which has not been approved in writing, and the Contractor hereby agrees that it shall have no right to additional compensation for any work not so authorized.

4. Claims. The Contractor shall not be entitled to the payment of any additional compensation for any cause, including any act, or failure to act, by the City, or the happening of any event, thing or occurrence, unless he shall have given the City due written notice of potential claim as hereinafter specified.

The written notice of potential claim shall set forth the reasons for which the Contractor believes additional compensation will or may be due, the nature of the costs involved, and, insofar as possible, the amount of the potential claim. Said notice shall be submitted on a form approved by the City at least forty-eight (48) hours (two working days) in advance of performing said work, unless the work is of an emergency nature, in which case the Contractor shall notify and obtain approval from the Inspector prior to commencing the work. The City Manager may require the Contractor to delay construction involving the claim, but no other work shall be delayed, and the Contractor shall not be allowed additional costs for any said delay but may be allowed on extension of time if the City Manager agrees that the work delayed is a controlling element of the Construction Schedule. The Contractor shall be required to submit any supporting data (or a detailed

written explanation justifying further delay) within five (5) Work Days of a request from the City Manager and shall be responsible for any delays resulting from late and/or incomplete submittals. By submitting a Bid, the Contractor hereby agrees that this Section shall supersede Sections 6-6.3 and 6-6.4 of the Standard Specifications.

The City shall be the sole authority to interpret all plans, specifications and contract documents, and no claim shall be accepted which is based on the Contractor's ignorance, misunderstanding or noncompliance with any provision or portion thereof.

The Contractor shall be responsible to provide all data and to obtain all approvals required by said Specifications. No claims or extras shall be approved by the City unless all work was done under the direction of and subject to the approval of the Inspector.

It is the intention of this Subsection that differences between the parties arising under and by virtue of the Contract be brought to the attention of the City Manager at the earliest possible time in order that such matters may be settled, if possible, or other appropriate action promptly taken. The Contractor hereby agrees that it shall have no right to additional compensation for any claim that may be based on any such act, failure to act, event, thing or occurrence for which no written notice of potential claim as herein required was filed.

5. Noncompliance with Plans and Specifications. Failure of the Contractor to comply with any requirement of the Plans and Specifications, and/or to immediately remedy any such noncompliance upon notice from the City Manager, may result in suspension of Contract Progress Payments. Any Progress Payments so suspended shall remain in suspension until the Contractor's operations and/or submittals are brought into compliance to the satisfaction of the City Manager. No additional compensation shall be allowed as a result of suspension of Progress Payments due to noncompliance with the plans or specifications. The Contractor shall not be permitted to stop work due to said suspension of Progress Payments.

6. Request for Payment. Contractor shall submit all requests for payment on AIA Document G702 – Application and Certificate for Payment and G703- Continuation Sheet. For each item provide a column for listing: Item Number; Description of Work; Scheduled Value, Previous Application; Authorized Change Orders; Total completed and Stored to Date of Application; Percentage of Completion; Balance to Finish; and Retainage.

   Prior to submittal of said form, all items for which payment is requested shall be checked and approved in writing by the City Manager. No payments will be made unless all back-up data is submitted with the payment request and the Progress Payment Invoice is signed by both Contractor and Manager.

   The City will retain 5 percent of the value of all work done and materials installed as part security for fulfillment of the contract by Contractor. The full 5 percent retention will be retained on all payments for 35 days after the filing of the Notice of Completion.

   There shall be no separate payment for any relocations, barriers or forms, grading or temporary construction required to construct the improvements herein. Payment for these items shall be absorbed in the Bid Prices for the applicable work to which they are appurtenant, and no extra costs shall be allowed.

The payment of amounts due to the Contractor shall be contingent upon the Contractor furnishing the City with a release of all claims against the City arising by virtue of the Contract related to said amounts. It is the contractor's responsibility to provide the correct releases in order to obtain payment by the City. The Contractor shall provide the City with Unconditional Lien Release on Final Payment with a zero balance is required from all material suppliers and subcontractors with the request for final payment.

PART D

BID DOCUMENTS

BIDDER'S PROPOSAL

BID FOR PUEBLO PARK IMPROVEMENTS
B2014-22

In accordance with the Notice Inviting Bids pertaining to the receiving of sealed proposals by the City Clerk of the City of Torrance for the above titled improvement, the undersigned hereby proposes to furnish all work to be performed in accordance with the Plans, Specifications and Contract Documents, prepared by Land Concern for the lump sum bid as set forth in the following schedules.

Assignment of Contractor's values:

Item	Description	Total Amount
Division 01	General Requirements:	
Division 02	Site Work:	
Division 03	Concrete:	
Division 04	Masonry:	
Division 05	Metals:	
Division 06	Wood and Plastics:	
Division 07	Thermal and Moisture Protection:	
Division 08	Doors and Windows:	
Division 09	Finishes:	
Division 10	Specialties:	
Division 11	Equipment:	
Division 12	Furnishings:	
Division 13	Special Construction:	

Item	Description	Total Amount
Division 14	Conveying Systems:	
Division 15	Mechanical:	
Division 16	Electrical:	
	B2014-22 -BID TOTAL- in figures*	

BID TOTAL: _____

(Words)*

Bid Alternate	Turf (Sodded) in lieu of Turf (seeding) in base bid. Price should reflect difference.	

BID ALTERNATE: _____

(Words)*

***BID MAY BE REJECTED IF TOTAL IS NOT SHOWN IN FIGURES AND WORDS.**

The undersigned furthermore agrees to enter into and execute a contract, with necessary bonds, at the prices set forth herein and in case of default in executing such contract, with necessary bonds, the check or bond accompanying this bid and the money payable thereon shall be forfeited thereby to and remain the property of the City of Torrance.

The above prices include all work appurtenant to the various items as outlined in the specifications and all work or expense required for the satisfactory completion of said item.

The undersigned declares that it has carefully examined the Plans, Specifications, and Contract Documents, and has investigated the site of the work and is familiar with the conditions thereon.

_____ _____

Contractor Name Signer's Name and Title

Date:_____License No. & Classification _____

Address:_____

ACKNOWLEDGMENT OF ADDENDA RECEIVED

B2014-22

The Bidder shall acknowledge the receipt of addenda by placing an "X" by each addendum received.

Addendum No. 1 _____

Addendum No. 2 _____

Addendum No. 3 _____

Addendum No. 4 _____

Addendum No. 5 _____

Addendum No. 6 _____

Addendum No. 7 _____

Addendum No. 8 _____

If an addendum or addenda have been issued by the City and not noted above as being received by the Bidder, the Bid Proposal may be rejected.

_____ _____

Bidder's Signature Date

STATE OF CALIFORNIA }
}
COUNTY OF _____ }

CONTRACTOR'S AFFIDAVIT
B2014-22

_____, being first duly sworn, deposes and says:

1. That he is the _____
Title

of _____
(Name of Partnership, Corporation, or Sole Proprietorship)

hereinafter called "Contractor," who has submitted to the City of Torrance a proposal for the BID FOR PUEBLO PARK IMPROVEMENTS, B2014-22.

2. That said proposal is genuine; that the same is not sham; that all statement of facts therein are true;

3. That such proposal was not made in the interest or behalf of any person, partnership, company, association, organization or corporation not named or disclosed;

4. That the Contractor did not directly or indirectly induce, solicit or agree with any-one else to submit a false or sham bid, refrain from bidding, or withdraw the bid, to raise or fix the bid price of the Contractor or anyone else, or to raise or fix any overhead, profit or cost element of the Contractor's price or the price of anyone else; and did not attempt to induce action prejudicial to the interest of the City of Torrance or any other bidder, or anyone else interested in the proposed contract;

5. That the Contractor has not in any manner sought by collusion to secure for itself an advantage over any other bidder or to induce action prejudicial to the interests of the City of Torrance, or of any other bidder or of anyone else interested in the proposed contract;

That the Contractor has not accepted any bid from any subcontractor or materialman through any bid depository, the bylaws, rules or regulations of which prohibit or prevent the Contractor from considering any bid from any subcontractor or materialman, which is not processed through said bid depository, or which prevent any subcontractor or materialman from bidding to any contractor who does not use the facilities of or accept bids from or through such bid depository;

CONTRACTOR'S AFFIDAVIT (CONTINUED)

7. That the Contractor did not, directly or indirectly, submit the Contractor's bid price or any breakdown thereof, or the contents thereof, or divulge information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, or to any individual or group of Individuals, except to the City of Torrance, or to any person or persons who have a partnership or other financial interest with said Contractor in its business.

Dated this _____ day of _____, 20_____.

Subscribed and Sworn to
before me this _____
of _____, 20_____

_____
(Contractor)

_____
(Title)

_____
Notary Public in and for said
County and State.
(Seal)

BID BOND

B2014-22

KNOW ALL MEN BY THESE PRESENTS: That we, _____
_____

as principal, and _____
as sureties, are held and firmly bound unto the City of Torrance, State of California, in the penal sum of _____ dollars ($_____), for the payment whereof we hereby bind ourselves, our successors, heirs, executors or administrators jointly and severally, firmly by these presents.

The condition of this obligation is such that, whereas the above bounded principal is about to file with and submit to the City of Torrance a bid or proposal for the performance of certain work as required in the City of Torrance, Project No. B2014-22, said work being: the Pueblo Park Improvements, in compliance with the Specifications therefore under an invitation of said City contained in a notice or advertisement for bids or proposals; now if the bid or proposal of said principal shall be accepted and if said work be thereupon awarded to the principal by said City and if the said principal shall enter into a contract with the said City in accordance with said bid or proposal, or if the bid or proposal of the said principal is rejected, then this bond shall be void and of no effect and otherwise in full force and effect.

WITNESS our hands this _____ day of _____, 20 _____.

_____
Principal

_____
Surety/Attorney-in-Fact

_____
Signature

Name: _____
Local Address: _____
_____
Phone No.: _____
Fax No.: _____

LIST OF SUBCONTRACTORS

The Bidder is required to fill in the following blanks in accordance with the provisions of the Subletting and Subcontracting Fair Practices Act (Chapter 2 of Division 5, Title 1 of the Government Code of the State of California) and should familiarize itself with Section 2-3 of the Standard Specifications.

Name under Which Subcontractor is Licensed: _____

_____

License Number: _____

Address of Office, Mill or Shop: _____

Specific Description of Sub-Contract: _____

_____

Name under Which Subcontractor is Licensed: _____

_____

License Number: _____

Address of Office, Mill or Shop: _____

Specific Description of Sub-Contract: _____

_____

Name under Which Subcontractor is Licensed: _____

_____

License Number: _____

Address of Office, Mill or Shop: _____

Specific Description of Sub-Contract: _____

_____

Name Under Which Subcontractor is Licensed: _____

_____

License Number: _____

Address of Office, Mill or Shop: _____

Specific Description of Sub-Contract: _____

_____

Subcontractors listed in accordance with the provisions of Section 2-3 must be properly licensed under the laws of the State of California for the type of work which they are to perform. Do not list alternate subcontractors for the same work.

REFERENCES

(Public Works projects similar in magnitude and degree of difficulty completed by Contractor within the past five (5) years.).

1.Name (Firm/Agency): _____

Address:_____

Contact Person:_____ Telephone No.:_____

Title of Project:_____

Project Location: _____

Date of Completion_____Contract Amount:$_____

2.Name (Firm/Agency): _____

Address:_____

Contact Person:_____ Telephone No.:_____

Title of Project:_____

Project Location: _____

Date of Completion_____Contract Amount:$_____

3.Name (Firm/Agency): _____

Address:_____

Contact Person:_____ Telephone No.:_____

Title of Project:_____

Project Location: _____

Date of Completion_____Contract Amount:$_____

4.Name (Firm/Agency): _____

Address: _____

Contact Person:_____ Telephone No.:_____

Title of Project:_____

Project Location: _____

Date of Completion_____Contract Amount: $_____

Bidder's Information

The bidder must provide a detailed list of the trades and the description of the work they will perform with their own company for this project.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

13. _____

14. _____

Contractor's License No.: _____ Class: _____

Date first obtained: _____

Has License ever been suspended or revoked? _____

If yes, describe when and why _____

Any current claims against License or Bond? _____

If yes, describe claims: _____

Type of entity (check one)

_____ Incorporated _____ Partnership _____ Sole Proprietorship

If incorporated, in what state _____

Federal Tax ID Number #_____

Principals in Company (List all - attach additional sheets if necessary):

NAME	**TITLE**	**LICENSE NO. (If Applicable)**
_____	_____	_____
_____	_____	_____
_____	_____	_____

PART E.

DOCUMENTS TO BE COMPLETED AND DELIVERED TO CITY AS PART OF CONTRACT WITH THE CITY

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, _____as Principal(s) and __a corporation, incorporated, organized, and existing under the laws of the State of _____, and authorized to execute bonds and undertakings and to do a general surety business in the State of California, as Surety, are jointly and severally held and firmly bound unto the City of Torrance, a municipal corporation, located in the County of Los Angeles, State of California, in the full and just 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 and our respective heirs, executors, administrators, representative, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that: WHEREAS, said Principal(s) have/has entered into, or are/is about to enter into, a certain written contract or agreement, dated as of the _____ day of _____, 20____, with the said City of Torrance for the PUEBLO PARK IMPROVEMENTS, B2014-22 , all as is more specifically set forth in said contract or agreement, a full, true and correct copy of which is hereunto attached, and hereby referred to and by this reference incorporated herein and made a part hereof;

NOW, THEREFORE, if the said Principal(s) shall faithfully and well and truly do, perform and complete, or cause to be done, performed and complete, each and all of the covenants, terms, conditions, requirements, obligations, acts and things, to be met, done or performed by said Principal(s), including any guarantee period as set forth in, or required by, said contract or agreement, all at and within the time or times, and in the manner as therein specified and contemplated, then this bond and obligation shall be null and void; otherwise it shall be and remain in full force, virtue and effect.

The said Surety, for value received, hereby stipulates and agrees that no amendment, change, extension of time, alteration or addition to said contract or agreement, or of any feature or item or items of performance required therein or there under, shall in any manner affect its obligations on or under this bond; and said Surety does hereby waive notice of any such amendment, change, extension of time, alteration, or addition to said contract or agreement, and of any feature or item or items of performance required therein or there under.

PERFORMANCE BOND (CONTINUED)

In the event any suit, action or proceedings is instituted to recover on this bond or obligation, said Surety will pay, and does hereby agree to pay, as attorney's fees for said City, such sum as the Court in any such suit, action or proceeding may adjudge reasonable.

EXECUTED, SEALED AND DATED this _____ day of _____, 20____

CORPORATE SEAL

PRINCIPAL(S):

BY _____

BY _____

CORPORATE SEAL

SURETY:

BY _____

Name: _____
Local Address: _____
_____
Phone No.: _____
Fax No.: _____

LABOR AND MATERIAL BOND

KNOW ALL MEN BY THESE PRESENTS:

That we,_____
As Principal(s) and _____ a corporation, incorporated, organized, and existing under the laws of the State of _____, and authorized to execute bonds and undertakings and to do a general surety business in the State of California, as Surety, are jointly and severally held and firmly bound unto:

(a) The State of California for the use and benefit of the State Treasurer, as ex-officio Treasurer and custodian of the Unemployment Fund of said State; and

(b) The City of Torrance, California; and

(c) Any and all persons who do or perform or who did or performed work or labor upon or in connection with the work or improvement referred to in the contract or agreement hereinafter mentioned; and

(d) Any and all materialmen, persons, companies, firms, association, or corporations, supplying or furnishing any materials, provisions, provender, transportation, appliances or power, or other supplies used in, upon, for or about or in connection with the performance of the work or improvement contracted to be executed, done, made or performed under said contract or agreement; and

(e) Any and all persons, companies, firms, associations, or corporations furnishing, renting, or hiring teams, equipment, implements or machinery for, in connection with, or contributing to, said work to be done or improvement to be made under said contract or agreement; and

(f) Any and all persons, companies, firms, associations, or corporations who supply both work and materials;

and whose claim has not been paid by said Principal(s), in full and just sum of _____ Dollars ($_____), lawful money of the United States of America, for the payment of which will and truly to be made, said Principal(s) and said Surety do hereby bind themselves and their respective heirs, executors, administrators, representatives, successors and assigns, jointly and severally, firmly by these presents.

LABOR AND MATERIAL BOND (CONTINUED)

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH, THAT: WHEREAS, said Principal(s) have/has entered into or are/is about to enter into a certain written contract or agreement, dated as of the _____ day of _____20 ___, with the City of Torrance for the PUEBLO PARK IMPROVEMENTS, B2014-22, all as is more specifically set forth in said contract or agreement, a full, true and correct copy of which is hereunto attached, and hereby referred to and by this reference incorporated herein and made a part hereof;

NOW, THEREFORE, if the said Principal(s) (or any of his/her, its, or their subcontractors) under said contract or agreement fails or fail to pay:

(1) For any materials, provisions, provender, transportation, appliances, or power, or other supplies; or

(2) For the hire of any teams, equipment, implements, or machinery; or

(3) For any work or labor; supplies, furnished, provided, used, done or performed in, upon, for or about or in connection with the said work or improvement; or

(4) For amounts due under the Unemployment Insurance Act of the State of California with respect to such work or improvement;

the Surety on this bond will pay the same in an amount not exceeding the sum hereinabove specified in this bond; and, also, in case suit is brought upon this bond, said Surety will (and does hereby agree to) pay a reasonable attorney's fee, to be fixed and taxed as costs, and included in the judgment therein rendered.

This bond shall (and it is hereby made to) insure to the benefit of any and all persons entitled to file claims under Section 1192.1 of the Code of Civil Procedure of the State of California, so as to give a right of action to them or their assigns in any suit brought upon this bond, all as contemplated under the provisions of Section 4205 of the Government Code, and of Chapter 1 of Title 4 of Part 3 of the Code of Civil Procedure, of the State of California.

This bond is executed and filed in connection with said contract or agreement hereunto attached to comply with each and all of the provisions of the laws of the State of California above mentioned or referred to, and of all amendments thereto, and the obligors so intend and do hereby bind themselves accordingly.

LABOR AND MATERIAL BOND (CONTINUED)

The said Surety, for value received, hereby stipulates and agrees that no amendment, change, extension of time, alteration, or addition to said contract or agreement, or of any feature or item or items of performance required therein or thereunder, shall in any manner affect its obligations on or under this bond; and said Surety does hereby waive notice of any such amendment, change, extension of time, alteration, or addition to said contract or agreement, and of any feature or item or items of performance required therein or thereunder.

EXECUTED, SEALED AND DATED this _____ day of _____, 20 _____

CORPORATE SEAL

PRINCIPAL:

BY _____

CORPORATE SEAL

SURETY:

BY _____

Name: _____
Local Address: _____
_____
Phone No.: _____
Fax No.: _____

PUBLIC WORKS AGREEMENT

This PUBLIC WORKS AGREEMENT ("Agreement") is made and entered into as of DATE (the "Effective Date"), by and between the CITY OF TORRANCE, a municipal corporation ("CITY"), and CONTRACTOR NAME, TYPE OF ENTITY ("CONTRACTOR").

RECITALS:

A. The CITY wishes to retain the services of an experienced and qualified CONTRACTOR to construct the **PROJECT NAME & BID NUMBER**;

B. In order to obtain the desired services, The CITY has circulated a Notice Inviting Bids for the construction of the **PROJECT NAME & BID NUMBER** (the "NIB"); and

C. CONTRACTOR has submitted a Bid (the "Bid") in response to the NIB. CONTRACTOR represents that it is qualified to perform those services requested in the Plans and Specifications. Based upon its review of all Bids submitted in response to the NIB, The CITY is willing to award the contract to CONTRACTOR.

AGREEMENT:

1. SERVICES TO BE PERFORMED BY CONTRACTOR

CONTRACTOR will provide the services and install those materials listed in the Plans and Specifications, which are on file in the Public Works Department. The NIB and the Plans and Specifications are made a part of this Agreement. A copy of the Bid is attached as Exhibit A.

2. TERM

Unless earlier terminated in accordance with Paragraph 4 below, this Agreement will continue in full force and effect for two years from the Effective Date.

3. COMPENSATION

A. CONTRACTOR's Fee.

For services rendered pursuant to this Agreement, CONTRACTOR will be paid in accordance with CONTRACTOR's Bid; provided, however, that in no event will the total amount of money paid the CONTRACTOR, for services initially contemplated by this Agreement, exceed the sum of $INSERT DOLLAR AMOUNT ("Agreement Sum"), unless otherwise first approved in writing by the CITY.

B. Schedule of Payment.
Provided that the CONTRACTOR is not in default under the terms of this Agreement, upon presentation of an invoice, CONTRACTOR will be paid monthly, within 30 days after the date of the monthly invoice.

4. TERMINATION OF AGREEMENT

A. Termination by CITY for Convenience.

1. CITY may, at any time, terminate the Agreement for CITY's convenience and without cause.

2. Upon receipt of written notice from CITY of such termination for CITY's convenience, CONTRACTOR will:

   a) cease operations as directed by CITY in the notice;
   b) take actions necessary, or that CITY may direct, for the protection and preservation of the work; and
   c) except for work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

3. In case of such termination for CITY's convenience, CONTRACTOR will be entitled to receive payment for work executed; and costs incurred by reason of such termination, along with reasonable overhead and profit on the work not executed.

B. Termination for Cause.

1. If either party fails to perform any term, covenant or condition in this Agreement and that failure continues for 15 calendar days after the nondefaulting party gives the defaulting party notice of the failure to perform, this Agreement may be terminated for cause; provided, however, that if during the notice period the defaulting party has promptly commenced and continues diligent efforts to remedy the default, the defaulting party will have such additional time as is reasonably necessary to remedy the default.

2. In the event this Agreement is terminated for cause by the default of the CONTRACTOR, the CITY may, at the expense of the CONTRACTOR and its surety, complete this Agreement or cause it to be completed. Any check or bond delivered to the CITY in connection with this Agreement, and the money payable thereon, will be forfeited to and remain the property of the CITY. All moneys due the CONTRACTOR under the terms of this Agreement will be retained by the CITY, but the retention will not release the CONTRACTOR and its surety from liability for the default. Under these circumstances, however, the CONTRACTOR and its surety will be credited with the amount of money retained, toward any amount by which the cost of completion exceeds the Agreement Sum and any amount authorized for extra services.

3. Termination for cause will not affect or terminate any of the rights of the CITY as against the CONTRACTOR or its surety then existing, or which may thereafter accrue because of the default; this provision is in addition to all other rights and remedies available to the CITY under law.

C. Termination for Breach of Law.

In the event the CONTRACTOR or any of its officers, directors, shareholders, employees, agents, subsidiaries or affiliates is convicted (i) of a criminal offense as an incident to obtaining or attempting to obtain a public or private contract or subcontract, or in the performance of a contract or subcontract; (ii) under state or federal statutes of embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, or any other offense indicating a lack of business integrity or business honesty which currently, seriously, and directly affects responsibility as a public consultant or contractor; (iii) under state or federal antitrust statutes arising out of the submission of bids or proposals; or (iv) of violation of Paragraph 19 of this Agreement; or for any other cause the CITY determines to be so serious and compelling as to affect CONTRACTOR's responsibility as a public consultant or contractor, including but not limited to, debarment by another governmental agency, then the CITY reserves the unilateral right to terminate this Agreement or to impose such other sanctions (which may include financial sanctions, temporary suspensions or any other condition deemed appropriate short of termination) as it deems proper. The CITY will not take action until CONTRACTOR has been given notice and an opportunity to present evidence in mitigation.

5. FORCE MAJEURE

If any party fails to perform its obligations because of strikes, lockouts, labor disputes, embargoes, acts of God, inability to obtain labor or materials or reasonable substitutes for labor or materials, governmental restrictions, governmental regulations, governmental controls, judicial orders, enemy or hostile governmental action, civil commotion, fire or other casualty, or other causes beyond the reasonable control of the party obligated to perform, then that party's performance shall be excused for a period equal to the period of such cause for failure to perform.

6. RETENTION OF FUNDS

CONTRACTOR authorizes the CITY to deduct from any amount payable to CONTRACTOR (whether or not arising out of this Agreement) any amounts the payment of which may be in dispute or that are necessary to compensate the CITY for any losses, costs, liabilities, or damages suffered by the CITY, and all amounts for which the CITY may be liable to third parties, by reason of CONTRACTOR's negligent acts or omissions or willful misconduct in performing or failing to perform CONTRACTOR's obligations under this Agreement. In the event that any claim is made by a third party, the amount or validity of which is disputed by CONTRACTOR, or any indebtedness exists that appears to be the

basis for a claim of lien, the CITY may withhold from any payment due, without liability for interest because of the withholding, an amount sufficient to cover the claim. The failure of the CITY to exercise the right to deduct or to withhold will not, however, affect the obligations of CONTRACTOR to insure, indemnify, and protect the CITY as elsewhere provided in this Agreement.

7. THE CITY'S REPRESENTATIVE

The General Services Director is designated as the "City Representative," authorized to act in its behalf with respect to the work and services specified in this Agreement and to make all decisions in connection with this Agreement. Whenever approval, directions, or other actions are required by the CITY under this Agreement, those actions will be taken by the City Representative, unless otherwise stated. The City Manager has the right to designate another City Representative at any time, by providing notice to CONTRACTOR.

8. CONTRACTOR REPRESENTATIVE(S)

The following principal(s) of CONTRACTOR are designated as being the principal(s) and representative(s) of CONTRACTOR authorized to act in its behalf with respect to the work specified in this Agreement and make all decisions in connection with this Agreement:

REPRESENTATIVE 1
REPRESENTATIVE 2

9. INDEPENDENT CONTRACTOR

The CONTRACTOR is, and at all times will remain as to the CITY, a wholly independent contractor. Neither the CITY nor any of its agents will have control over the conduct of the CONTRACTOR or any of the CONTRACTOR's employees, except as otherwise set forth in this Agreement. The CONTRACTOR may not, at any time or in any manner, represent that it or any of its agents or employees are in any manner agents or employees of the CITY. CITY has no duty, obligation, or responsibility to CONTRACTOR's agents or employees under the Affordable Care Act. CONTRACTOR is solely responsible for any tax penalties associated with the failure to offer affordable coverage to its agents and employees under the Affordable Care Act and any other liabilities, claims and obligations regarding compliance with the Affordable Care Act with respect to CONTRACTOR's agents and employees. CITY is not responsible and shall not be held liable for CONTRACTOR's failure to comply with CONTRACTOR's duties, obligations, and responsibilities under the Affordable Care Act. CONTRACTOR agrees to defend, indemnify and hold CITY harmless for any and all taxes and penalties that may be assessed against CITY as a result of CONTRACTOR's obligations under the Affordable Care Act relating to CONTRACTOR's agents and employees.

10. BUSINESS LICENSE

The CONTRACTOR must obtain a City business license prior to the start of work under this Agreement, unless CONTRACTOR is qualified for an exemption.

11. OTHER LICENSES AND PERMITS

CONTRACTOR warrants that it has all professional, contracting and other permits and licenses required to undertake the work contemplated by this Agreement.

12. FAMILIARITY WITH WORK

By executing this Agreement, CONTRACTOR warrants that CONTRACTOR (a) has thoroughly investigated and considered the scope of services to be performed, (b) has carefully considered how the services should be performed, and (c) fully understands the facilities, difficulties and restrictions attending performance of the services under this Agreement. If the services involve work upon any site, CONTRACTOR warrants that CONTRACTOR has or will investigate the site and is or will be fully acquainted with the conditions there existing, prior to commencement of services set forth in this Agreement. Should CONTRACTOR discover any latent or unknown conditions that will materially affect the performance of the services set forth in this Agreement, CONTRACTOR must immediately inform the CITY of that fact and may not proceed except at CONTRACTOR's risk until written instructions are received from the CITY.

13. CARE OF WORK

CONTRACTOR must adopt reasonable methods during the life of the Agreement to furnish continuous protection to the work, and the equipment, materials, papers, documents, plans, studies and other components to prevent losses or damages, and will be responsible for all damages, to persons or property, until acceptance of the work by the CITY, except those losses or damages as may be caused by the CITY's own negligence.

14. CONTRACTOR'S ACCOUNTING RECORDS; OTHER PROJECT RECORDS

Records of the CONTRACTOR's time pertaining to the project, and records of accounts between the CITY and the CONTRACTOR, will be kept on a generally recognized accounting basis. CONTRACTOR will also maintain all other records, including without limitation specifications, drawings, progress reports and the like, relating to the project. All records will be available to the CITY during normal working hours. CONTRACTOR will maintain these records for three years after final payment.

15. INDEMNIFICATION

CONTRACTOR will indemnify, defend, and hold harmless CITY, the Successor Agency to the Former Redevelopment Agency of the City of Torrance, the City

Council, each member thereof, present and future, its officers, agents and employees from and against any and all liability, expenses, including defense costs and legal fees, and claims for damages whatsoever, including, but not limited to, those arising from breach of contract, bodily injury, death, personal injury, property damage, loss of use, or property loss however the same may be caused and regardless of the responsibility for negligence. The obligation to indemnify, defend and hold harmless includes, but is not limited to, any liability or expense, including defense costs and legal fees, arising from the negligent acts or omissions, or willful misconduct of CONTRACTOR, its officers, employees, agents, subcontractors or vendors. It is further agreed, CONTRACTOR's obligations to indemnify, defend and hold harmless will apply even in the event of concurrent negligence on the part of CITY, the City Council, each member thereof, present and future, or its officers, agents and employees, except for liability resulting solely from the negligence or willful misconduct of CITY, its officers, employees or agents. Payment by CITY is not a condition precedent to enforcement of this indemnity. In the event of any dispute between CONTRACTOR and CITY, as to whether liability arises from the sole negligence of the CITY or its officers, employees, agents, subcontractors or vendors, CONTRACTOR will be obligated to pay for CITY's defense until such time as a final judgment has been entered adjudicating the CITY as solely negligent. CONTRACTOR will not be entitled in the event of such a determination to any reimbursement of defense costs including but not limited to attorney's fees, expert fees and costs of litigation.

16. NON-LIABILITY OF THE CITY'S OFFICERS AND EMPLOYEES

No officer or employee of the CITY will be personally liable to CONTRACTOR, in the event of any default or breach by the CITY or for any amount that may become due to CONTRACTOR.

17. INSURANCE

A. CONTRACTOR must maintain at its sole expense the following insurance, which will be full coverage not subject to self insurance provisions:

1. Automobile Liability, including owned, non-owned and hired vehicles, with at least the following limits of liability:

   a. Combined single limits of $2,000,000 per occurrence.

2. General Liability including coverage for premises, products and completed operations, independent contractors, personal injury and contractual obligations with combined single limits of coverage of at least $3,000,000 per occurrence, with an annual aggregate of no less than $5,000,000.

3. Workers' Compensation with limits as required by the State of California and Employers Liability with limits of at least $1,000,000.

B. The insurance provided by CONTRACTOR will be primary and non-contributory.

C. CITY, the Successor Agency to the Former Redevelopment Agency of the City of Torrance, the City Council and each member thereof, members of boards and commissions, every officer, agent, official, employee and volunteer must be named as additional insureds under the automobile and general liability policies.

D. CONTRACTOR must provide certificates of insurance and/or endorsements to the City Clerk of the City of Torrance before the commencement of work.

E. Each insurance policy required by this Paragraph must contain a provision that no termination, cancellation or change of coverage can be made without thirty days notice to the CITY.

F. CONTRACTOR must include all subcontractors as insureds under its policies or must furnish separate certificates and endorsements for each subcontractor. All coverage for subcontractors will be subject to all of the requirements of this Paragraph 17.

18. SUFFICIENCY OF INSURERS

Insurance required by this Agreement will be satisfactory only if issued by companies admitted to do business in California, rated "B+" or better in the most recent edition of Best's Key Rating Guide, and only if they are of a financial category Class VII or better, unless these requirements are waived by the Risk Manager of the CITY ("Risk Manager") due to unique circumstances. In the event the Risk Manager determines that the work or services to be performed under this Agreement creates an increased or decreased risk of loss to the CITY, the CONTRACTOR agrees that the minimum limits of any insurance policies and/or the performance bond required by this Agreement may be changed accordingly upon receipt of written notice from the Risk Manager; provided that CONTRACTOR will have the right to appeal a determination of increased coverage by the Risk Manager to the City Council of the CITY within 10 days of receipt of notice from the Risk Manager.

19. CONFLICT OF INTEREST

A. No officer or employee of the CITY may have any financial interest, direct or indirect, in this Agreement, nor may any officer or employee participate in any decision relating to the Agreement that effects the officer or employee's financial interest or the financial interest of any corporation, partnership or association in which the officer or employee is, directly or indirectly interested, in violation of any law, rule or regulation.

B. No person may offer, give, or agree to give any officer or employee or former officer or employee, nor may any officer or employee solicit, demand, accept, or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval,

disapproval, recommendation, preparation or any part of a program requirement or a purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any way pertaining to any program requirement, contract or subcontract, or to any solicitation or proposal.

20. NOTICE

A. All notices, requests, demands, or other communications under this Agreement will be in writing. Notice will be sufficiently given for all purposes as follows:

1. Personal delivery. When personally delivered to the recipient: notice is effective on delivery.

2. First Class mail. When mailed first class to the last address of the recipient known to the party giving notice: notice is effective three mail delivery days after deposit in an United States Postal Service office or mailbox.

3. Certified mail. When mailed certified mail, return receipt requested: notice is effective on receipt, if delivery is confirmed by a return receipt.

4. Overnight delivery. When delivered by an overnight delivery service, charges prepaid or charged to the sender's account: notice is effective on delivery, if delivery is confirmed by the delivery service.

5. Facsimile transmission. When sent by fax to the last fax number of the recipient known to the party giving notice: notice is effective on receipt. Any notice given by fax will be deemed received on the next business day if it is received after 5:00 p.m. (recipient's time) or on a non-business day.

6. Addresses for purpose of giving notice are as follows:

CONTRACTOR:	CONTRACTOR'S NAME AND ADDRESS
	Fax: INSERT FAX NUMBER
CITY:	City Clerk City of Torrance 3031 Torrance Boulevard Torrance, CA 90509-2970 Fax: (310) 618-2931

with a copy to: Attn: PROJECT MANAGER'S NAME
General Services Department
City of Torrance
3350 Civic Center Drive
Torrance, CA 90503
Fax: (310) 781-7199

B. Any correctly addressed notice that is refused, unclaimed, or undeliverable because of an act or omission of the party to be notified, will be deemed effective as of the first date the notice was refused, unclaimed or deemed undeliverable by the postal authorities, messenger or overnight delivery service.

C. Either party may change its address or fax number by giving the other party notice of the change in any manner permitted by this Agreement.

21. PROHIBITION AGAINST ASSIGNMENT AND SUBCONTRACTING

This Agreement and all exhibits are binding on the heirs, successors, and assigns of the parties. The Agreement may not be assigned or subcontracted by either the CITY or CONTRACTOR without the prior written consent of the other.

22. INTEGRATION; AMENDMENT

This Agreement represents the entire understanding of the CITY and CONTRACTOR as to those matters contained in it. No prior oral or written understanding will be of any force or effect with respect to the terms of this Agreement. The Agreement may not be modified or altered except in writing signed by both parties.

23. INTERPRETATION

The terms of this Agreement should be construed in accordance with the meaning of the language used and should not be construed for or against either party by reason of the authorship of this Agreement or any other rule of construction that might otherwise apply.

24. SEVERABILITY

If any part of this Agreement is found to be in conflict with applicable laws, that part will be inoperative, null and void insofar as it is in conflict with any applicable laws, but the remainder of the Agreement will remain in full force and effect.

25. TIME OF ESSENCE

Time is of the essence in the performance of this Agreement.

26. GOVERNING LAW; JURISDICTION

This Agreement will be administered and interpreted under the laws of the State of California. Jurisdiction of any litigation arising from the Agreement will be in Los Angeles County, California.

27. COMPLIANCE WITH STATUTES AND REGULATIONS

CONTRACTOR will be knowledgeable of and will comply with all applicable federal, state, county and city statutes, rules, regulations, ordinances and orders.

28. WAIVER OF BREACH

No delay or omission in the exercise of any right or remedy by a nondefaulting party on any default will impair the right or remedy or be construed as a waiver. A party's consent or approval of any act by the other party requiring the party's consent or approval will not be deemed to waive or render unnecessary the other party's consent to or approval of any subsequent act. Any waiver by either party of any default must be in writing and will not be a waiver of any other default concerning the same or any other provision of this Agreement.

29. ATTORNEY'S FEES

Except as provided for in Paragraph 15, in any dispute, litigation, arbitration, or other proceeding by which one party either seeks to enforce its rights under this Agreement (whether in contract, tort or both) or seeks a declaration of any rights or obligations under this Agreement, the prevailing party will be awarded reasonable attorney's fees, together with any costs and expenses, to resolve the dispute and to enforce any judgment.

30. EXHIBITS

All exhibits identified in this Agreement are incorporated into the Agreement by this reference.

31. CONTRACTOR'S AUTHORITY TO EXECUTE

The persons executing this Agreement on behalf of the CONTRACTOR warrant that (i) the CONTRACTOR is duly organized and existing; (ii) they are duly authorized to execute this Agreement on behalf of the CONTRACTOR; (iii) by so executing this Agreement, the CONTRACTOR is formally bound to the provisions of this Agreement; and (iv) the entering into this Agreement does not violate any provision of any other Agreement to which the CONTRACTOR is bound.

CITY OF TORRANCE,
a Municipal Corporation

BUSINESS OR INDIVIDUAL NAME
TYPE OF ENTITY

_____
Frank Scotto, Mayor

By: _____
SIGNER, TITLE

ATTEST:

_____
Sue Herbers, City Clerk

APPROVED AS TO FORM:

JOHN L. FELLOWS III
City Attorney

By: _____

Attachment: Exhibit A: Bid

EXHIBIT A

Bid

PART F

WAGE DETERMINATIONS

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1 FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: DRIVER (ON/OFF-HAULING TO/FROM CONSTRUCTION SITE)

Determination: C-MT-261-X-258-2009-2
Issue Date: August 22, 2009
Expiration date of determination: June 30, 2010* Effective until superseded by a new determination issued by the Director of Industrial Relations. Contact the Division of Labor Statistics and Research at (415) 703-4774 for the new rates after 10 days from the expiration date, if no subsequent determination is issued.
Localities: All localities within Los Angeles, Orange and Ventura Counties.

		Employer Payments					Straight-Time		Overtime Hourly Rate		
Classification	Basic Hourly Rate	Health And Welfare	Pension	Vacation And Holiday[d]	Training	Other	Hours	Total Hourly Rate	Daily (1½ X)	Saturday/ Holiday (1½ X)	Sunday[e] (2 X)
Ready Mix Driver[a]	$21.25	$4.60[b]	$3.44	$0.41[c]	-	-	8.0	$29.70	$40.33	$40.33	$50.95

[a] New hires will be subject to employment at hourly rates that are four dollars ($4.00) less, three dollars ($3.00) less, two dollars ($2.00) less, and one dollar ($1.00) less than the straight time hourly rate for time periods of twelve (12) months each until they reach the Journeyman basic hourly rate.
[b] The contribution applies to all hours until $796.50 is paid for the month.
[c] $0.98 after 4 months of service
$1.39 after 1 year of service
$1.80 after 7 years of service
$2.21 after 14 years of service
[d] Includes $0.57 for Holidays after four (4) months, which would be deducted from the Vacation/Holiday rate if you choose to adopt the paid days off enumerated in the Holiday Provisions.
[e] Emergency work and breakdown on Sundays shall be paid at time and one-half (1½x) the straight time rate.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at http://www.dir.ca.gov/DLSR/PWD. Holiday provisions for current or superseded determinations may be obtained by contacting the Prevailing Wage Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence requirements for the current determinations on the Internet at http://www.dir.ca.gov/DLRS/PWD. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Prevailing Wage Unit at (415) 703-4774.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1 FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: DRIVER (ON/OFF-HAULING TO/FROM CONSTRUCTION SITE)

Determination: C-DT-830-261-10-2009-1
Issue Date: February 22, 2009
Expiration date of determination: March 3, 2010* Effective until superseded by a new determination issued by the Director of Industrial Relations. Contact the Division of Labor Statistics and Research at (415) 703-4774 for the new rates after 10 days from the expiration date, if no subsequent determination is issued.
Localities: All localities within Imperial, Inyo, Los Angeles, Mono, Orange, Riverside, San Bernardino and San Diego Counties.

		Employer Payments					Straight-Time		Overtime Hourly Rate	
Classification	Basic Hourly Rate	Health And Welfare[a]	Pension	Vacation And Holiday[b]	Training	Other	Hours	Total Hourly Rate	Daily (1½ X)[c]	Sunday/ Holiday (1½ X)
Driver: Dump Truck	$17.00	$2.05	$0.085	$0.33	-	-	8.0	$19.465	$27.965	$27.965

[a] The contribution applies to all work up to $355.00 per month.
[b] $0.65 after 2 years of service
$0.98 after 5 years of service
$1.31 after 9 years of service
[c] Rate applies to work in excess of eight (8) hours daily and forty (40) hours weekly.
*There is no predetermined increase applicable to this determination.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at http://www.dir.ca.gov/DLSR/PWD. Holiday provisions for current or superseded determinations may be obtained by contacting the Prevailing Wage Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence requirements for the current determinations on the Internet at http://www.dir.ca.gov/DLRS/PWD. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Prevailing Wage Unit at (415) 703-4774.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1

FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #BUILDING/CONSTRUCTION INSPECTOR AND FIELD SOILS AND MATERIAL TESTER

DETERMINATION: SC-23-63-2-2014-1D
ISSUE DATE: February 22, 2014
EXPIRATION DATE OF DETERMINATION: July 6, 2014** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within Imperial, Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara, and Ventura counties.

		Employer Payments					Straight – Time		Overtime Hourly Rate		
CLASSIFICATION (Journeyperson)	Basic Hourly Rate	Health and Welfare	Pension	Vacation/ Holiday (a)	Training	Other Payments	Hours	Total Hourly Rate	Daily (b)	Saturday (c)	Sunday/ Holiday
									1 1/2X	1 1/2X	2X
Classification Groups											
Group 1	$38.98	$11.20	$7.45	$2.95	$0.80	$0.29	8	$61.67	$81.160	$81.160	$100.65
Group 2	$40.76	$11.20	$7.45	$2.95	$0.80	$0.29	8	$63.45	$83.830	$83.830	$104.21
Group 3	$42.76	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.45	$86.830	$86.830	$108.21

# Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet @ http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at http://www.dir.ca.gov/das/das.html.

[a] Includes an amount withheld for supplemental dues.

[b] Rate applies to the first 4 overtime hours. All other daily overtime is paid at the Sunday rate.

[c] Rate applies to the first 12 hours worked. All other time is paid at the Sunday rate.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at http://www.dir.ca.gov/OPRL/PWD. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TTRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the Internet at http://www.dir.ca.gov/OPRL/PWD. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

CLASSIFICATIONS:

GROUP I
Field Soils and Materials Tester
Field Asphaltic Concrete (Soils and Materials Tester)
Field Earthwork (Grading Excavation and Filling)
Roof Inspector
Water Proofer

GROUP II
AWS-CWI Welding Inspector
Building / Construction Inspector
Licensed Grading Inspector
Reinforcing Steel
Reinforced Concrete
Pre-Tension Concrete
Post-Tension Concrete
Structural Steel and Welding Inspector
Glue-Lam and truss Joints
Truss-Type Joint Construction
Shear Wall and Floor System used as diaphragms
Concrete batch Plant
Spray-Applied Fireproofing
Structural masonry

Group III
Nondestructive Testing (NDT)

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1

FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #BUILDING/CONSTRUCTION INSPECTOR AND FIELD SOILS AND MATERIAL TESTER (SPECIAL SHIFT)

DETERMINATION: SC-23-63-2-2014-1D1

ISSUE DATE: February 22, 2014

EXPIRATION DATE OF DETERMINATION: July 6, 2014** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within Imperial, Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara, and Ventura counties.

		Employer Payments					Straight – Time		Overtime Hourly Rate		
CLASSIFICATION (Journeyperson)	Basic Hourly Rate	Health and Welfare	Pension	Vacation/ Holiday (a)	Training	Other Payments	Hours	Total Hourly Rate	Daily (b) 1 1/2X	Saturday (c) 1 1/2X	Sunday/ Holiday 2X
Classification Groups											
Group 1	$39.48	$11.20	$7.45	$2.95	$0.80	$0.29	8	$62.17	$81.910	$81.910	$101.65
Group 2	$41.26	$11.20	$7.45	$2.95	$0.80	$0.29	8	$63.95	$84.580	$84.580	$105.21
Group 3	$43.26	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.95	$87.580	$87.580	$109.21

# Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet @ http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at http://www.dir.ca.gov/das/das.html.

[a] Includes an amount withheld for supplemental dues.

[b] Rate applies to the first 4 overtime hours. All other daily overtime is paid at the Sunday rate.

[c] Rate applies to the first 12 hours worked. All other time is paid at the Sunday rate.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at http://www.dir.ca.gov/OPRL/PWD. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the Internet at http://www.dir.ca.gov/OPRL/PWD. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

CLASSIFICATIONS:

GROUP I
Field Soils and Materials Tester
Field Asphaltic Concrete (Soils and Materials Tester)
Field Earthwork (Grading Excavation and Filling)
Roof Inspector
Water Proofer

GROUP II
AWS-CWI Welding Inspector
Building / Construction Inspector
Licensed Grading Inspector
Reinforcing Steel
Reinforced Concrete
Pre-Tension Concrete
Post-Tension Concrete
Structural Steel and Welding Inspector
Glue-Lam and truss Joints
Truss-Type Joint Construction
Shear Wall and Floor System used as diaphragms
Concrete batch Plant
Spray-Applied Fireproofing
Structural masonry

Group III
Nondestructive Testing (NDT)

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1

FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #BUILDING/CONSTRUCTION INSPECTOR AND FIELD SOILS AND MATERIAL TESTER (MULTI-SHIFT)

DETERMINATION: SC-23-63-2-2014-1D2
Issue Date: February 22, 2014
EXPIRATION DATE OF DETERMINATION: July 6, 2014** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within Imperial, Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara, and Ventura counties.

		Employer Payments					Straight – Time		Overtime Hourly Rate		
CLASSIFICATION (Journeyperson)	Basic Hourly Rate	Health and Welfare	Pension	Vacation/ Holiday (a)	Training	Other Payments	Hours (d)	Total Hourly Rate	Daily (b) 1 1/2X	Saturday (c) 1 1/2X	Sunday/ Holiday 2X
Classification Groups											
Group 1	$39.98	$11.20	$7.45	$2.95	$0.80	$0.29	8	$62.67	$82.660	$82.660	$102.65
Group 2	$41.76	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.45	$85.330	$85.330	$106.21
Group 3	$43.76	$11.20	$7.45	$2.95	$0.80	$0.29	8	$66.45	$88.330	$88.330	$110.21

# Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet @ http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at http://www.dir.ca.gov/das/das.html.

[a] Includes an amount withheld for supplemental dues.

[b] Rate applies to the first 4 overtime hours. All other daily overtime is paid at the Sunday rate.

[c] Rate applies to the first 12 hours worked. All other time is paid at the Sunday rate.

[d] The Third Shift shall work 6.5 hours, exclusive of meal period, for which 8 hours straight-time shall be paid at the non-shift rate, Monday thorugh Friday.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at http://www.dir.ca.gov/OPRL/PWD. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the Internet at http://www.dir.ca.gov/OPRL/PWD. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

CLASSIFICATIONS:

GROUP I
Field Soils and Materials Tester
Field Asphaltic Concrete (Soils and Materials Tester)
Field Earthwork (Grading Excavation and Filling)
Roof Inspector
Water Proofer

GROUP II
AWS-CWI Welding Inspector
Building / Construction Inspector
Licensed Grading Inspector
Reinforcing Steel
Reinforced Concrete
Pre-Tension Concrete
Post-Tension Concrete
Structural Steel and Welding Inspector
Glue-Lam and truss Joints
Truss-Type Joint Construction
Shear Wall and Floor System used as diaphragms
Concrete batch Plant
Spray-Applied Fireproofing
Structural masonry

Group III
Nondestructive Testing (NDT)

STATE OF CALIFORNIA
DEPARTMENT OF INDUSTRIAL RELATIONS
Office of the Director – Research Unit
455 Golden Gate Avenue, 9th Floor
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Edmund G. Brown Jr., *Governor*

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San Francisco, CA 94142-0603

PREDETERMINED INCREASES FOR

OPERATING ENGINEER (SC-23-63-2-2014-1)
OPERATING ENGINEER (MULTI-SHIFT) (SC-23-63-2-2014-1)
OPERATING ENGINEER (SPECIAL SHIFT) (SC-23-63-2-2014-1)

CRANES, PILE DRIVER AND HOISTING EQUIPMENT (OPERATING ENGINEER) (SC-23-63-2-2014-1B)
CRANES, PILE DRIVER AND HOISTING EQUIPMENT (OPERATING ENGINEER, MULTI-SHIFT) (SC-23-63-2-2014-1B1)
CRANES, PILE DRIVER AND HOISTING EQUIPMENT (OPERATING ENGINEER, SPECIAL SHIFT) (SC-23-63-2-2014-1B2)

TUNNEL (OPERATING ENGINEER) (SC-23-63-2-2014-1C)
TUNNEL (OPERATING ENGINEER) (SC-23-63-2-2014-1C1) (MULTI-SHIFT)

BUILDING/CONSTRUCTION INSPECTOR, FIELD SOILS AND MATERIAL TESTER, AND NON-DESTRUCTIVE TESTING (SC-23-63-2-2014-1D)
BUILDING/CONSTRUCTION INSPECTOR, FIELD SOILS AND MATERIAL TESTER, AND NON-DESTRUCTIVE TESTING (SPECIAL SHIFT) (SC-23-63-2-2014-1D1)
BUILDING/CONSTRUCTION INSPECTOR, FIELD SOILS AND MATERIAL TESTER, AND NON-DESTRUCTIVE TESTING (MULTI-SHIFT) (SC-23-63-2-2014-1D2)

ALL LOCALITIES WITHIN IMPERIAL, INYO, KERN, LOS ANGELES, MONO, ORANGE, RIVERSIDE, SAN BERNARDINO, SAN LUIS OBISPO, SANTA BARBARA, AND VENTURA COUNTIES

These predetermined increases for the above named crafts apply to the current determinations for work being performed on public works projects with bid advertisement dates on or after **March 4, 2014,** until these determinations are superseded by a new determination(s) or a predetermined increase modification notice becomes effective.

When referencing our prevailing wage determinations, please note that if the prevailing wage rate determination which was in effect on the bid advertisement date of a project has a single asterisk (*) after the expiration date, the rate will be good for the life of the project. However, if a prevailing wage rate determination has double asterisks (**) after the expiration date, the rate must be updated on the following date to reflect the predetermined rate change(s).

OPERATING ENGINEER: All Classifications and All Shifts
The above determinations are currently in effect and will expire on July 6, 2014**.

Effective on July 7, 2014, there will be an increase of $2.00 to be allocated to wages and/or fringes.
Effective on July 6, 2015, there will be an increase of $2.00 to be allocated to wages and/or fringes.

There will be no further increases applicable to these determinations.

Issued 2/22/2014, Effective 3/4/2014
This page will be updated when wage rate breakdown information becomes available.

Last Updated: March 4, 2014

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1 FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: FENCE BUILDER (CARPENTER)

DETERMINATION: SC-23-31-20-2014-1
ISSUE DATE: February 22, 2014
EXPIRATION DATE OF DETERMINATION: June 30, 2014** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.
LOCALITY: All localities within Imperial, Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara, and Ventura counties.

		Employer Payments					Straight-Time		Overtime Hourly Rate		
Classification (Journeyperson)	Basic Hourly Rate	Health and Welfare	Pension	Vacation and Holiday	Training	Other	Hours	Total Hourly Rate	Daily 1 1/2X[a]	Saturday[b] 1 1/2X	Sunday and Holiday
Fence Builder	$34.69	$5.70	$3.91	$3.35	$0.42	$0.21	8	$48.28	$65.625	$65.625	$82.970

[a]Rate applies to the first 4 overtime hours. All other time is paid at the Sunday and Holiday overtime hourly rate.
[b]Saturdays in the same work week may be worked at straight-time for the first 8 hours if the job is shut down during the normal work week due to inclement weather, or reasons beyond the control of the employer.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at http://www.dir.ca.gov/OPRL/PWD. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the Internet at http://www.dir.ca.gov/OPRL/PWD. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

STATE OF CALIFORNIA
Edmund G. Brown Jr., *Governor*

DEPARTMENT OF INDUSTRIAL RELATIONS
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MAILING ADDRESS:
P. O. Box 420603
San Francisco, CA 94142-0603

PREDETERMINED INCREASE FOR

FENCE BUILDER (CARPENTER)

IN ALL LOCALITIES WITHIN IMPERIAL, INYO, KERN, LOS ANGELES, MONO, ORANGE, RIVERSIDE, SAN BERNARDINO, SAN DIEGO, SAN LUIS OBISPO, SANTA BARBARA, AND VENTURA COUNTIES

This predetermined increase for the above named craft applies only to the above referenced determination for work being performed on public works projects with bid advertisement dates on or after March 4, 2014, until this determination is superseded by a new determination or a predetermined increase modification notice becomes effective.

When referencing our prevailing wage determinations, please note that if the prevailing wage rate determination that was in effect on the bid advertisement date of a project has a single asterisk (*) after the expiration date, the rate will be good for the life of the project. However, if a prevailing wage rate determination has double asterisks (**) after the expiration date, the rate must be updated on the following date to reflect the predetermined rate change(s).

FENCE BUILDER (CARPENTER)
Determination SC-23-31-20-2014-1 is currently in effect and expires on June 30, 2014**.

Effective July 1, 2014, there will be an increase of $1.75 to be allocated to wages and/or fringe benefits.

There will be no further increases applicable to this determination.

Issued 2/22/2014, Effective 3/4/2014 until superseded.

This page will be updated when wage rate breakdown becomes available
Last Updated: March 4, 2014.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1

FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #LABORER AND RELATED CLASSIFICATIONS

DETERMINATION: SC-23-102-2-2013-1
ISSUE DATE: August 22, 2013
EXPIRATION DATE OF DETERMINATION: June 30, 2014** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within Imperial, Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara, and Ventura counties.

		Employer Payments					Straight-Time		Overtime Hourly Rates		
Classification [a] (Journeyperson)	Basic Hourly Rate	Health and Welfare	Pension	Vacation/ and Holiday[d]	Training	Other Payment	Hours	Total Hourly Rate	Daily[b] 1 1/2X	Saturday[bc] 1 1/2X	Sunday and Holiday
CLASSIFICATION GROUPS											
Group 1	$28.99	6.81	6.00	4.25	0.64	0.49	8	47.18	61.675	61.675	76.17
Group 2	29.54	6.81	6.00	4.25	0.64	0.49	8	47.73	62.50	62.50	77.27
Group 3	30.09	6.81	6.00	4.25	0.64	0.49	8	48.28	63.325	63.325	78.37
Group 4	31.64	6.81	6.00	4.25	0.64	0.49	8	49.83	65.65	65.65	81.47
Group 5	31.99	6.81	6.00	4.25	0.64	0.49	8	50.18	66.175	66.175	82.17

# Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet @ http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at http://www.dir.ca.gov/das/das.html.

[a] For classification within each group, see page 14.

[b] Any hours worked over 12 hours in a single workday are double (2) time.

[c] Saturdays in the same work week may be worked at straight-time if job is shut down during work week due to inclement weather or similar Act of God, or a situation beyond the employers control.

[d] Includes an amount per hour worked for supplemental dues

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at http://www.dir.ca.gov/OPRL/PWD. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the Internet at http://www.dir.ca.gov/OPRL/PWD. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

CLASSIFICATION GROUPS

GROUP 1

Boring Machine Helper (Outside)
Certified Confined Space Laborer
Cleaning and Handling of Panel Forms
Concrete Screeding for Rough Strike-Off
Concrete, Water Curing
Demolition Laborer, the cleaning of brick if performed by an employee performing any other phase of demolition work, and the cleaning of lumber
Fiberoptic Installation, Blowing, Splicing, and Testing Technician on public right-of- way only
Fire Watcher, Limbers, Brush Loaders, Pilers and Debris Handlers
Flagman
Gas, Oil and/or Water Pipeline Laborer
Laborer, Asphalt-Rubber Material Loader
Laborer, General or Construction
Laborer, General Cleanup
Laborer, Jetting
Laborer, Temporary Water and Air Lines
Plugging, Filling of Shee-Bolt Holes; Dry Packing of Concrete and Patching
Post Hole Digger (Manual)
Railroad Maintenance, Repair Trackman and Road Beds; Streetcar and Railroad Construction Track Laborers
Rigging and Signaling
Scaler
Slip Form Raisers
Tarman and Mortar Man
Tool Crib or Tool House Laborer
Traffic Control by any method
Water Well Driller Helper
Window Cleaner
Wire Mesh Pulling - All Concrete Pouring Operations

GROUP 2

Asphalt Shoveler
Cement Dumper (on 1 yard or larger mixer and handling bulk cement)
Cesspool Digger and Installer
Chucktender
Chute Man, pouring concrete, the handling of the chute from readymix trucks, such as walls, slabs, decks, floors, foundations, footings, curbs, gutters and sidewalks
Concrete Curer-Impervious Membrane and Form Oiler
Cutting Torch Operator (Demolition)
Fine Grader, Highways and Street Paving, Airport, Runways, and similar type heavy construction
Gas, Oil and/or Water Pipeline Wrapper-Pot Tender and Form Man
Guinea Chaser
Headerboard Man-Asphalt
Installation of all Asphalt Overlay Fabric and Materials used for Reinforcing Asphalt
Laborer, Packing Rod Steel and Pans
Membrane Vapor Barrier Installer
Power Broom Sweepers (small)
Riprap, Stonepaver, placing stone or wet sacked concrete
Roto Scraper and Tiller
Sandblaster (Pot Tender)
Septic Tank Digger and Installer (leadman)

GROUP 2 (continued)

Tank Scaler and Cleaner
Tree Climber, Faller, Chain Saw Operator, Pittsburgh Chipper and similar type Brush Shredders
Underground Laborer, including Caisson Bellower

GROUP 3

Asphalt Installation of all fabrics
Buggymobile Man
Compactor (all types including Tampers, Barko, Wacker)
Concrete Cutting Torch
Concrete Pile Cutter
Driller, Jackhammer, 2 1/2 ft. drill steel or longer
Dri Pak-it Machine
Gas, Oil and/or Water Pipeline Wrapper - 6-inch pipe and over by any method, inside and out
High Scaler (including drilling of same)
Impact Wrench, Multi-Plate
Kettlemen, Potmen and Men applying asphalt, lay-kold, creosote, lime caustic and similar type materials
Laborer, Fence Erector
Material Hoseman (Walls, Slabs, Floors and Decks)
Operators of Pneumatic, Gas, Electric Tools, Vibrating Machines, Pavement Breakers, Air Blasting, Come-Alongs, and similar mechanical tools not separately classified herein; operation of remote controlled robotic tools in connection with Laborers work
Pipelayer's backup man, coating, grouting, making of joints, sealing, caulking, diapering and including rubber gasket joints, pointing and any and all other services
Power Post Hole Digger
Rock Slinger
Rotary Scarifier or Multiple Head Concrete Chipping Scarifier
Steel Headerboard Man and Guideline Setter
Trenching Machine, Hand Propelled

GROUP 4

Any Worker Exposed to Raw Sewage
Asphalt Raker, Luteman, Ironer, Asphalt Dumpman, and Asphalt Spreader Boxes (all types)
Concrete Core Cutter (walls, floors or ceilings), Grinder or Sander
Concrete Saw Man, Cutting Walls or Flat Work, Scoring old or new concrete
Cribber, Shorer, Lagging, Sheeting and Trench Bracing, Hand-Guided Lagging Hammer
Head Rock Slinger
Laborer, Asphalt-Rubber Distributor Bootman
Laser Beam in connection with Laborer's work
Oversize Concrete Vibrator Operator, 70 pounds and over
Pipelayer
Prefabricated Manhole Installer
Sandblaster (Nozzleman), Water Blasting, Porta Shot-Blast
Traffic Lane Closure, certified

GROUP 5

Blasters Powderman
Driller
Toxic Waste Removal
Welding, certified or otherwise in connection with Laborers' work

STATE OF CALIFORNIA
DEPARTMENT OF INDUSTRIAL RELATIONS
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455 Golden Gate Avenue, 9th Floor
San Francisco, CA 94102

EDMUND G. BROWN, JR., *Governor*

ADDRESS REPLY TO:
P.O. Box 420603
San Francisco CA 94142-0603

PREDETERMINED INCREASES FOR

LABORER AND RELATED CLASSIFICATIONS (SC-23-102-2-2013-1)

ALL LOCALITIES WITHIN IMPERIAL, INYO, KERN, LOS ANGELES, MONO, ORANGE, RIVERSIDE, SAN BERNARDINO, SAN LUIS OBISPO, SANTA BARBARA, AND VENTURA COUNTIES

These predetermined increases for the above named craft applies only to the current determination for work being performed on public works projects with bid advertisement dates on or after **September 1, 2013**, until this determination is superseded by a new determination or a predetermined increase modification notice becomes effective.

When referencing our prevailing wage determinations, please note that if the prevailing wage rate determination which was in effect on the bid advertisement date of a project has a single asterisk (*) after the expiration date, the rate will be good for the life of the project. However, if a prevailing wage rate determination has double asterisks (**) after the expiration date, the rate must be updated on the following date to reflect the predetermined rate change(s).

LABORER

Determination SC-23-102-2-2013-1 is currently in effect and expires on June 30, 2014**.

Effective July 1, 2014, there will be an increase of $1.75: $0.25 to pension and $1.50 to be allocated to wages and/or employer payments.

There will be no further increases applicable to this determination.

Issued 8/22/2013, Effective 9/1/2013.

This page will be updated when wage rate breakdown information becomes available.
Last Updated: September 1, 2013

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1

FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #LANDSCAPE/IRRIGATION LABORER/TENDER

DETERMINATION: SC-102-X-14-2013-2
ISSUE DATE: August 22, 2013

EXPIRATION DATE OF DETERMINATION: July 31, 2014** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within Imperial, Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara and Ventura counties.

		Employer Payments					Straight-Time		Overtime Hourly Rate		
CLASSIFICATION (Journeyperson)	Basic Hourly Rate	Health and Welfare	Pension	Vacation and Holiday	Training	Other	Hours	Total Hourly Rate	Daily[b] 1 1/2X	Saturday[b] 1 1/2X	Sunday/ Holiday 2X
Landscape/Irrigation Laborer	$27.13	$6.81	$6.00	$4.25[a]	$0.64	$0.46	8	$45.29	$58.855	$58.855	$72.42
Landscape Hydro Seeder	$28.23	$6.81	$6.00	$4.25[a]	$0.64	$0.46	8	$46.39	$60.505	$60.505	$74.62

DETERMINATION: SC-102-X-14-2013-2A
ISSUE DATE: August 22, 2013

EXPIRATION DATE OF DETERMINATION: July 31, 2015* Effective until superseded by a new determination issued by the Director of Industrial Relations. Contact the Office of Policy, Research, and Legislation at (415) 703-4774 for new rates after 10 days from the expiration date, if no subsequent determination is issued.

LOCALITY: All localities within Imperial, Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara and Ventura counties.

Landscape/Irrigation Tender[c]	$11.64	$3.70	--	$0.51[a]	--	$0.21	8	$16.06	$21.88	$21.88	$27.70

#Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet at http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' Website at http://www.dir.ca.gov/das/das.html.

[a] Includes an amount per hour worked for Supplemental Dues.

[b] Rate applies to first 4 daily overtime hours and the first 12 hours on Saturday. All other time is paid at the Sunday and Holiday double-time rate.

[c] The first employee on the jobsite shall be a Landscape/Irrigation Laborer; the second employee on the jobsite must be an Apprentice or a Landscape/Irrigation Laborer; and the third and fourth employees may be Tenders. The fifth employee on the jobsite shall be a Landscape/Irrigation Laborer; the sixth employee must be an Apprentice or a Landscape/Irrigation Laborer ; and the seventh and eight employees may be Tenders. Thereafter, Tenders may be employed with Landscape/Irrigation Laborers in a 50/50 ratio on each jobsite. However, plant establishment may be performed exclusively by Landscape/Irrigation Tenders without the supervision of a Journeyman.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at http://www.dir.ca.gov/OPRL/PWD. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the Travel and/or subsistence provisions for the current determinations on the Internet at http://www.dir.ca.gov/OPLR/PWD. Travel and/or Subsistence provisions for current or superseded determinations may be obtained by contacting the Office of the Director - Research Unit at (415) 703-4774.

STATE OF CALIFORNIA
DEPARTMENT OF INDUSTRIAL RELATIONS
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Edmund G. Brown Jr., *Governor*

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PREDETERMINED INCREASE FOR

LANDSCAPE/IRRIGATION LABORER/TENDER
(SC-102-X-14-2013-2, SC-102-X-14-2013-2A)
LANDSCAPE /IRRIGATION LABORER
LANDSCAPE HYDRO SEEDER
LANDSCAPE/IRRIGATION TENDER

IN ALL LOCALITIES WITHIN IMPERIAL, INYO, KERN, LOS ANGELES, MONO, ORANGE, RIVERSIDE, SAN BERNARDINO, SAN LUIS OBISPO, SANTA BARBARA, AND VENTURA COUNTIES

This predetermined increase for the above named craft applies only to the current determination for work being performed on public works projects with bid advertisement dates on or after **September 1, 2013**, until this determination is superseded by a new determination or a predetermined increase modification notice becomes effective.

When referencing our prevailing wage determinations, please note that if the prevailing wage rate determination which was in effect on the bid advertisement date of a project has a single asterisk (*) after the expiration date, the rate will be good for the life of the project. However, if a prevailing wage rate determination has double asterisks (**) after the expiration date, the rate must be updated on the following date to reflect the predetermined rate change(s).

LANDSCAPE/IRRIGATION LABORER and LANDSCAPE HYDRO SEEDER
Determination SC-102-X-14-2013-2 is currently in effect and expires on July 31, 2014**.

Effective August 1, 2014, there will be an increase of $1.75 to be allocated to wages and/or fringe benefits.

There will be no further increases applicable to this determination.

LANDSCAPE/IRRIGATION TENDER
Determination SC-102-X-14-2013-2A is currently in effect and expires on July 31, 2015*.

There are no predetermined increases applicable to this determination.

Issued 8/22/2013, Effective 9/1/2013 until superseded.

This page will be updated when wage rate breakdown information becomes available.
Last Updated: September 1, 2013

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1

CRAFT: ## LANDSCAPE MAINTENANCE LABORER
(APPLIES ONLY TO ROUTINE LANDSCAPE MAINTENANCE WORK NOT NEW LANDSCAPE CONSTRUCTION)[1]

DETERMINATION: SC-LML-2013-1
ISSUE DATE: August 22, 2013
EXPIRATION DATE OF DETERMINATION: September 30, 2013* Effective until superseded by a new determination issued by the Director of Industrial Relations. Contact the Office of the Director – Research Unit at (415) 703-4774 for the new rates after 10 days from the expiration date, if no subsequent determination is issued.

		Employer Payments					Straight-Time		Overtime
LOCALITY:	Basic Hourly Rate	Health and Welfare	Pension	Vacation	Holiday	Training	Hours	Total Hourly Rate	1 1/2X
Imperial	$8.00	-	-	[a] 0.115	0.17	-	8	[b] 8.285	[b] 12.285
Inyo, Mono and San Bernardino	8.00	-	-	0.30	0.17	-	8	8.47	12.47
Kern	8.00	-	-	[c] 0.16	0.17	-	8	[b] 8.33	[b] 12.33
	10.00	-	-	[d] 0.27	0.46	-	8	[b] 10.73	[b] 15.73
Los Angeles	8.00	0.89	-	[e] 0.115	0.14	-	8	[b] 9.145	[b] 13.145
Orange	8.00	-	-	[f] 0.11	0.11	-	8	[b] 8.22	[b] 12.22
Riverside	8.00	-	-	[g] 0.20	0.16	-	8	[b] 8.36	[b] 12.36
San Diego	8.00	-	-	0.22	0.115	-	8	8.335	12.335
	8.00	-	-	0.24	0.12	-	8	8.36	12.36
San Luis Obispo	8.00	-	-	[k] 0.15	0.15	-	8	8.30	12.30
	8.00	-	-	[l] 0.16	0.16	-	8	8.32	12.32
Santa Barbara	8.00	-	-	[h] 0.12	0.12	-	8	[b] 8.24	[b] 12.24
	8.00	-	-	[i] 0.13	0.13	-	8	[b] 8.26	[b] 12.26
Ventura	8.00	-	-	0.115	0.16	-	8	8.275	12.275
	8.00	2.97	-	[j] 0.19	0.26	-	8	[b] 11.42	[b] 15.42

Craft is not apprenticeable.

NOTE: If there are two rates, the first rate is for routine work, the second rate is for complex work.

[a] $0.22 after 3 years of service.
[b] Computation is based on the first years of employment. This rate should be increased by any applicable vacation increase as stated in other footnotes.
[c] $0.31 after 2 years of service.
[d] $0.54 after 2 years of service: $0.81 after 3 years of service.
[e] $0.24 after 3 years of service: $0.37 after 7 years of service.
[f] $0.22 after 4 years of service.
[g] $0.40 after 3 years of service.
[h] $0.23 after 2 years of service.
[i] $0.27 after 2 years of service.
[j] $0.38 after 3 years of service.
[k] $0.29 after 2 years of service.
[l] $0.31 after 2 years of service.

[1] This determination does not apply to work of a landscape laborer employed on landscape construction (work incidental to construction or post-construction maintenance during the plant installation and establishment period). The following is a description of the landscape work cover under this determination:

ROUTINE – mowing, watering, pruning, trimming, weeding, spraying, occasional planting and replacement of plants and janitorial work incidental to such landscape maintenance.
COMPLEX – servicing of irrigation and sprinkler systems, repairing of equipment use in such landscape maintenance.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at http://www.dir.ca.gov/OPRL/PWD. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the Internet at http://www.dir.ca.gov/OPRL/PWD. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1

FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #OPERATING ENGINEER

DETERMINATION: SC-23-63-2-2014-1
ISSUE DATE: February 22, 2014
EXPIRATION DATE OF DETERMINATION: July 6, 2014** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within Imperial, Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara, and Ventura counties.

		Employer Payments					Straight – Time		Overtime Hourly Rate		
CLASSIFICATION (Journeyperson)	Basic Hourly Rate	Health and Welfare	Pension	Vacation/ Holiday (a)	Training	Other Payments	Hours	Total Hourly Rate	Daily (c)	Saturday (d)	Sunday/ Holiday
									1 1/2X	1 1/2X	2X
Classification Groups (b)											
Group 1	$38.20	$11.20	$7.45	$2.95	$0.80	$0.29	8	$60.89	$79.990	$79.990	$99.09
Group 2	$38.98	$11.20	$7.45	$2.95	$0.80	$0.29	8	$61.67	$81.160	$81.160	$100.65
Group 3	$39.27	$11.20	$7.45	$2.95	$0.80	$0.29	8	$61.96	$81.595	$81.595	$101.23
Group 4	$40.76	$11.20	$7.45	$2.95	$0.80	$0.29	8	$63.45	$83.830	$83.830	$104.21
Group 6	$40.98	$11.20	$7.45	$2.95	$0.80	$0.29	8	$63.67	$84.160	$84.160	$104.65
Group 8	$41.09	$11.20	$7.45	$2.95	$0.80	$0.29	8	$63.78	$84.325	$84.325	$104.87
Group 10	$41.21	$11.20	$7.45	$2.95	$0.80	$0.29	8	$63.90	$84.505	$84.505	$105.11
Group 12	$41.38	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.07	$84.760	$84.760	$105.45
Group 13	$41.48	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.17	$84.910	$84.910	$105.65
Group 14	$41.51	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.20	$84.955	$84.955	$105.71
Group 15	$41.59	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.28	$85.075	$85.075	$105.87
Group 16	$41.71	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.40	$85.255	$85.255	$106.11
Group 17	$41.88	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.57	$85.510	$85.510	$106.45
Group 18	$41.98	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.67	$85.660	$85.660	$106.65
Group 19	$42.09	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.78	$85.825	$85.825	$106.87
Group 20	$42.21	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.90	$86.005	$86.005	$107.11
Group 21	$42.38	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.07	$86.260	$86.260	$107.45
Group 22	$42.48	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.17	$86.410	$86.410	$107.65
Group 23	$42.59	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.28	$86.575	$86.575	$107.87
Group 24	$42.71	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.40	$86.755	$86.755	$108.11
Group 25	$42.88	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.57	$87.010	$87.010	$108.45

# indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet @ http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at http://www.dir.ca.gov/das/das.html.

[a] Includes an amount withheld for supplemental dues.

[b] For classifications within each group, see pages 8 and 9.

[c] Rate applies to the first 4 overtime hours. All other daily overtime is paid at the Sunday rate.

[d] Rate applies to the first 12 hours worked. All other time is paid at the Sunday rate.

NOTE: For Special Shift and Multi-Shift, see pages 9A and 9B.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at http://www.dir.ca.gov/OPRL/PWD. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

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DETERMINATION: SC-23-63-2-2014-1

CLASSIFICATIONS:

GROUP 1

Bargeman
Brakeman
Compressor Operator
Ditchwitch, with seat or similar type equipment
Elevator Operator - Inside
Engineer Oiler
Forklift Operator (includes loed, lull or similar types – under 5 tons)
Generator Operator
Generator, Pump or Compressor Plant Operator
Heavy Duty Repairman Helper
Pump Operator
Signalman
Switchman

GROUP 2

Asphalt-Rubber Plant Operator (Nurse Tank Operator)
Concrete Mixer Operator - Skip Type
Conveyor Operator
Fireman
Forklift Operator (includes loed, lull or similar types – over 5 tons)
Hydrostatic Pump Operator
Oiler Crusher (Asphalt or Concrete Plant)
Petromat Laydown Machine
RJU Side Dump Jack
Rotary Drill Helper (Oilfield)
Screening and Conveyor Machine Operator (or similar types)
Skiploader (Wheel type up to 3/4 yd. without attachment)
Tar Pot Fireman
Temporary Heating Plant Operator
Trenching Machine Oiler

GROUP 3

Asphalt Rubber Blend Operator
Bobcat or similar type (Skid Steer, with all attachments)
Equipment Greaser (rack)
Ford Ferguson (with dragtype attachments)
Helicopter Radioman (ground)
Stationary Pipe Wrapping and Cleaning Machine Operator

GROUP 4

Asphalt Plant Fireman
Backhoe Operator (mini-max or similar type)
Boring Machine Operator
Boring System Electronic Tracking Locator
Boxman or Mixerman (asphalt or concrete)
Chip Spreading Machine Operator
Concrete Cleaning Decontamination Machine Operator
Concrete Pump Operator (small portable)
Drilling Machine Operator, Small Auger types (Texoma Super Economatic, or similar types - Hughes 100 or 200, or similar types - drilling depth of 30 maximum)
Equipment Greaser (grease truck)
Excavator Track/Rubber-Tired (Operating weight under 21,000 lbs)
Guard Rail Post Driver Operator
Highline Cableway Signalman
Hydra-Hammer-Aero Stomper
Hydraulic Casing Oscillator Operator – drilling depth of 30' maximum
Micro Tunneling Operator (above ground tunnel)
Power Concrete Curing Machine Operator
Power Concrete Saw Operator
Power - Driver Jumbo Form Setter Operator
Power Sweeper Operator
Rock Wheel Saw/Trencher
Roller Operator (compacting)
Screed Operator (asphalt or concrete)
Trenching Machine Operator (up to 6ft.)
Vacuum or Muck Truck

GROUP 5 (for multi-shift rate, see page 9B)

Equipment Greaser (Grease Truck/Multi-Shift)

GROUP 6

Articulating Material Hauler
Asphalt Plant Engineer
Batch Plant Operator
Bit Sharpener
Concrete Joint Machine Operator (canal and similar type)
Concrete Placer Operator
Concrete Planer Operator
Dandy Digger
Deck Engine Operator
Deck Engineer
Derrickman (oilfield type)

Drilling Machine Operator, Bucket or Auger types (Calweld 100 bucket or similar types - Watson 1000 auger or similar types - Texoma 330, 500 or 600 auger or similar types - drilling depth of 45' maximum)
Drilling Machine Operator (including water wells)
Hydraulic Casing Oscillator Operator – drilling depth of 45' maximum
Hydrographic Seeder Machine Operator (straw, pulp or seed)
Jackson Track Maintainer, or similar type
Kalamazoo Switch Tamper, or similar type
Machine Tool Operator
Maginnis Internal Full Slab Vibrator
Mechanical Berm, Curb or Gutter (concrete or asphalt)
Mechanical Finisher Operator (concrete, Clary-Johnson-Bidwell or similar)
Micro Tunnel System Operator (below ground)
Pavement Breaker Operator
Railcar Mover
Road Oil Mixing Machine Operator
Roller Operator (asphalt or finish)
Rubber-Tired Earthmoving Equipment (single engine, up to and including 25 yds. struck)
Self-Propelled Tar Pipelining Machine Operator
Skiploader Operator (crawler and wheel type, over 3/4 yds. and up to and including 1 1/2 yds.
Slip Form Pump Operator (power driven hydraulic lifting device for concrete forms)
Tractor Operator - Bulldozer, Tamper-Scraper (single engine, up to 100 H.P. flyweel and similar types, up to and including D-5 and similar types)
Tugger Hoist Operator (1 drum)
Ultra High Pressure Waterjet Cutting Tool System Operator
Vacuum Blasting Machine Operator
Volume Mixer Operator
Welder – General

GROUP 7 (for multi-shift rate, see page 9B)

Welder – General (Multi-Shift)

GROUP 8

Asphalt or Concrete Spreading Operator (tamping or finishing)
Asphalt Paving Machine Operator (barber greene or similar type, one (1) Screedman)
Asphalt-Rubber Distributor Operator
Backhoe Operator (up to and including 3/4 yds.) small ford, case or similar
Backhoe Operator (over 3/4 yd. and up to 5 cu. yds. M.R.C.)
Barrier Rail Mover (BTM Series 200 or similar types)
Cast in Place Pipe Laying Machine Operator
Cold Foamed Asphalt Recycler
Combination Mixer and Compressor Operator (gunite work)
Compactor Operator - Self Propelled
Concrete Mixer Operator - Paving
Crushing Plant Operator
Drill Doctor
Drilling Machine Operator, Bucket or Auger types (Calweld 150 bucket or similar types - Watson 1500, 2000, 2500 auger or similar types - Texoma 700, 800 auger or similar types - drilling depth of 60' maximum)
Elevating Grader Operator
Excavator Track/Rubber-Tired (Operating Weight 21,000 lbs - 100,000 lbs)
Global Positioning System/GPS (or Technician)
Grade Checker
Gradall Operator
Grouting Machine Operator
Heavy Duty Repairman/Pump Installer
Heavy Equipment Robotics Operator
Hydraulic Cusing Oscillator Operator – drilling depth of 60' maximum
Hydraulic Operated Grout Plant (excludes hand loading)
Kalamazoo Ballast Regulator or similar type
Klemm Drill Operator or similar types
Kolman Belt Loader and similar type
Le Tourneau Blob Compactor or similar type
Lo Drill
Loader Operator (Athey, Euclid, Sierra and similar types)
Master Environmental Maintenance Mechanic
Mobark Chipper or similiar types
Ozzie Padder or similar types
P.C. 490 Slot Saw
Pneumatic Concrete Placing Machine Operator (Hackley-Presswell or similar type)
Prentice 721E Hydro-Ax
Pumperete Gun Operator
Rock Drill or Similiar Types (see Miscellaneous Provision #4 for additional information regarding this classification)
Rotary Drill Operator (excluding caison type)
Rubber-Tired Earth Moving Equipment Operator (single engine, caterpillar, euclid, athey wagon, and similar types with any and all attachments over 25 yds. and up to and including 50 cu. yds. struck)
Rubber-Tired Earth Moving Eqoipment Operator (multiple engine - up to and including 25 yds. struck)
Rubber-Tired Scraper Operator (self-loading paddle wheel type - John Deere, 1040 and similar single unit)
Self-Propelled Curb and Gutter Machine Operator
Shuttle Buggy
Skiploader Operator (crawler and wheel type over 1 1/2 yds. up to and including 6 1/2 yds.)
Soil Remediation Plant Operator (CMI, Envirotech or Similar)
Soil Stabilizer and Reclaimer (WR-2400)
Somero SXP Laser Screed
Speed Swing Operator
Surface Heaters and Planer Operator
Tractor Compressor Drill Combination Operator

DETERMINATION: SC-23-63-2-2014-1

GROUP 8 CONT.

Tractor Operator (any type larger than D-5 - 100 flyweel H.P. and over, or similar – bulldozer, tamper, scraper and push tractor, single engine)

Tractor Operator (boom attachments)

Traveling Pipe Wrapping, Cleaning and Bending Machine Operator

Trenching Machine Operator (over 6 ft. depth capacity, manufacturer's rating)

Trenching Machine with Road Miner Attachment (over 6ft. depth capacity, manufacturer's rating - Oiler or Journeyman Trainee required)

Ultra High Pressure Waterjet Cutting Tool System Mechanic

Water Pull (compaction)

GROUP 9 (for multi-shift rate, see page 9B)

Heavy Duty Repairman (Multi-Shift)

GROUP 10

Backhoe Operator (over 5 cu. yds. M.R.C.)

Drilling Machine Operator, Bucket or Auger types (Calweld 200 B bucket or similar types - Watson 3000 or 5000 auger or similar types - Texoma 900 auger or similar types - drilling depth of 105' maximum)

Dual Drum Mixer

Dynamic Compactor LDC350 or similar types

Heavy Duty Repairman-Welder combination

Hydraulic Casing Oscillator Operator – drilling depth of 105' maximum

Monorail Locomotive Operator (diesel, gas or electric)

Motor Patrol - Blade Operator (single engine)

Multiple Engine Tractor Operator (euclid and similar type - except quad 9 cat.)

Pneumatic Pipe Ramming Tool and similar types

Pre-stressed Wrapping Machine Operator (2 Operators required)

Rubber - Tired Earth Moving Equipment Operator (single engine, over 50 yds. struck)

Rubber - Tired Earth Moving Equipment Operator (multiple engine, euclid caterpillar and similar - over 25 yds. and up to 50 yds. struck)

Tower Crane Repairman

Tractor Loader Operator (crawler and wheel-type over 6 1/2 yds.)

Welder - Certified

Woods Mixer Operator (and similar pugmill equipment)

GROUP 11 (for multi-shift rate, see page 9B)

Heavy Duty Repairman – Welder Combination (Multi-Shift)

Welder – Certified (Multi-Shift)

GROUP 12

Auto Grader Operator

Automatic Slip Form Operator

Backhoe Operator (over 7 cu. yds. M.R.C.)

Drilling Machine Operator, Bucket or Auger types (Calweld, auger 200 CA or similar types - watson, auger 6000 or similar types - hughes super duty, auger 200 or similar types - drilling depth of 175' maximum)

Excavator Track/Rubber Tired (Operating Weight 100,000 lbs. - 200,000 lbs)

Hoe Ram or similar with compressor

Hydraulic Casing Oscillator Operator – drilling depth of 175' maximum

Mass Excavator Operator - less than 750 cu. yds.

Mechanical Finishing Machine Operator

Mobile Form Traveler Operator

Motor Patrol Operator (multi-engine)

Pipe Mobile Machine Operator

Rubber-Tired Earth Moving Equipment Operator (multiple engine, euclid, caterpillar and similar type, over 50 cu. yds. struck)

Rubber-Tired Self-Loading Scraper Operator (paddle-wheel-auger type self-loading - (two (2) or more units)

GROUP 13

Rubber-Tired Earth Moving Equipment Operator, Operating Equipment with the Push-Pull System (single engine, up to and including 25 yds. struck)

GROUP 14

Canal Liner Operator

Canal Trimmer Operator

Remote Controlled Earth Moving Operator ($1.00 per hour additional to base rate)

Wheel Excavator Operator (over 750 cu. yds. per hour)

GROUP 15

Rubber-Tired Earth Moving Equipment Operator, Operating Equipment with the Push-Pull System (single engine, caterpillar, euclid, athey wagon, and similar types with any and all attachments over 25 yds. and up to and including 50 cu. yds. struck)

Rubber-Tired Earth Moving Equipment Operator, Operating Equipment with the Push-Pull System (multiple engine - up to and including 25 yds. struck)

GROUP 16

Excavator Track/Rubber Tired (Operating Weight exceeding 200,000 lbs.)

Rubber-Tired Earth Moving Equipment Operator, Operating Equipment with the Push-Pull System (single engine, over 50 yds. struck)

Rubber-Tired Earth Moving Equipment Operator, Operating Equipment with the Push-Pull System (multiple engine, euclid, caterpillar, and similar, over 25 yds. and up to 50 yds. struck)

GROUP 17

Rubber-Tired Earth Moving Equipment Operator, Operating Equipment with the Push-Pull System (multiple engine, euclid, caterpillar, and similar type, over 50 cu. yds. struck)

Tandem Tractor Operator (operating crawler type tractors in tandem - Quad 9 and similar type)

GROUP 18

Rubber-Tired Earth Moving Equipment Operator, Operating in Tandem (scrapers, belly dumps, and similar types in any combination, excluding compaction units - single engine, up to and including 25 yds. struck)

GROUP 19

Rotex Concrete Belt Operator

Rubber-Tired Earth Moving Equipment Operator, Operating in Tandem (scrapers, belly dumps, and similar types in any combination, excluding compaction units - single engine, caterpillar, euclid, athey wagon, and similar types with any and all attachments over 25 yds. and up to and including 50 cu. yds. struck)

Rubber-Tired Earth Moving Equipment Operator, Operating in Tandem (scrapers, belly dumps, and similar types in any combination, excluding compaction units - multiple engines, up to and including 25 yds. struck)

GROUP 20

Rubber-Tired Earth Moving Equipment Operator, Operating in Tandem (scrapers, belly dumps, and similar types in any combination, excluding compaction units - single engine, over 50 yds. struck)

Rubber-Tired Earth Moving Equipment Operator, Operating in Tandem (scrapers, belly dumps, and similar types in any combination, excluding compaction units - multiple engine, euclid, caterpillar and similar, over 25 yds. and up to 50 yds. struck)

Drilling Machine Operator, Bucket or Auger types (Calweld, auger 200 CA or similar types -

GROUP 21

Rubber-Tired Earth Moving Equipment Operator, Operating in Tandem (scrapers, belly dumps, and similar types in any combination, excluding compaction units - multiple engine, euclid, caterpillar and similar type, over 50 cu. yds. struck)

GROUP 22

Rubber-Tired Earth Moving Equipment Operator, Operating Equipment with the Tandem Push-Pull System (single engine, up to and including 25 yds. struck)

GROUP 23

Rubber-Tired Earth Moving Equipment Operator, Operating Equipment with the Tandem Push-Pull System (single engine, caterpillar, euclid, athey wagon, and similar types with any and all attachments over 25 yds. and up to and including 50 cu. yds. struck)

Rubber-Tired Earth Moving Equipment Operator, Operating Equipment with the Tandem Push-Pull System (multiple engine, up to and including 25 yds. struck)

GROUP 24

Rubber-Tired Earth Moving Equipment Operator, Operating Equipment with the Tandem Push-Pull System (single engine, over 50 yds. Struck)

Rubber-Tired Earth Moving Equipment Operator, Operating Equipment with the Tandem Push-Pull System (multiple engine, euclid, caterpillar and similar, over 25 yds. and up to 50 yds. struck)

GROUP 25

Concrete Pump Operator-Truck Mounted

Pedestal Concrete Pump Operator

Rubber-Tired Earth Moving Equipment Operator, Operating Equipment with the Tandem Push-Pull System (multiple engine, euclid, caterpillar and similar over 50 cu. yds struck)

MISCELLANEOUS PROVISIONS:

1. Operators on hoists with three drums shall receive fifteen cents (15¢) per hour additional pay to the regular rate of pay. The additional pay shall be added to the regular rate and become the base rate for the entire shift.
2. All heavy duty repairman and heavy duty combination shall receive fifty cents (50¢) per hour tool allowance in addition to their regular rate of pay and this shall become their base rate of pay.
3. Employees required to suit up and work in a hazardous material environment, shall receive Two Dollars ($2.00) per hour in addition to their regular rate of pay, and that rate shall become the basic hourly rate of pay.
4. A review of rock drilling is currently pending. The minimum acceptable rate of pay for this classification or type of work on public works projects is Laborer and Related Classifications/Group 5 (Driller) as published on pages 13 and 14 of the Director's General Prevailing Wage Determinations. However, the published rate for the craft/classification of Operating Engineer/Group 8 (Rock Drill or Similar Types) may be used by contractors to perform rock drilling on public works projects.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1

FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #OPERATING ENGINEER (Special Shift)

DETERMINATION: SC-23-63-2-2014-1
ISSUE DATE: February 22, 2014
EXPIRATION DATE OF DETERMINATION: July 6, 2014** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within Imperial, Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara, and Ventura counties.

		Employer Payments					Straight – Time		Overtime Hourly Rate		
CLASSIFICATION (Journeyperson)	Basic Hourly Rate	Health and Welfare	Pension	Vacation/ Holiday (a)	Training	Other Payments	Hours	Total Hourly Rate	Daily (c) 1 1/2X	Saturday (d) 1 1/2X	Sunday/ Holiday 2X
Classification Groups (b)											
Group 1	$38.70	$11.20	$7.45	$2.95	$0.80	$0.29	8	$61.39	$80.740	$80.740	$100.09
Group 2	$39.48	$11.20	$7.45	$2.95	$0.80	$0.29	8	$62.17	$81.910	$81.910	$101.65
Group 3	$39.77	$11.20	$7.45	$2.95	$0.80	$0.29	8	$62.46	$82.345	$82.345	$102.23
Group 4	$41.26	$11.20	$7.45	$2.95	$0.80	$0.29	8	$63.95	$84.580	$84.580	$105.21
Group 6	$41.48	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.17	$84.910	$84.910	$105.65
Group 8	$41.59	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.28	$85.075	$85.075	$105.87
Group 10	$41.71	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.40	$85.255	$85.255	$106.11
Group 12	$41.88	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.57	$85.510	$85.510	$106.45
Group 13	$41.98	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.67	$85.660	$85.660	$106.65
Group 14	$42.01	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.70	$85.705	$85.705	$106.71
Group 15	$42.09	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.78	$85.825	$85.825	$106.87
Group 16	$42.21	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.90	$86.005	$86.005	$107.11
Group 17	$42.38	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.07	$86.260	$86.260	$107.45
Group 18	$42.48	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.17	$86.410	$86.410	$107.65
Group 19	$42.59	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.28	$86.575	$86.575	$107.87
Group 20	$42.71	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.40	$86.755	$86.755	$108.11
Group 21	$42.88	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.57	$87.010	$87.010	$108.45
Group 22	$42.98	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.67	$87.160	$87.160	$108.65
Group 23	$43.09	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.78	$87.325	$87.325	$108.87
Group 24	$43.21	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.90	$87.505	$87.505	$109.11
Group 25	$43.38	$11.20	$7.45	$2.95	$0.80	$0.29	8	$66.07	$87.760	$87.760	$109.45

# Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet @ http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at http://www.dir.ca.gov/das/das.html.

[a] Includes an amount withheld for supplemental dues.

[b] For classifications within each group, see pages 8 and 9.

[c] Rate applies to the first 4 overtime hours. All other daily overtime is paid at the Sunday rate.

[d] Rate applies to the first 12 hours worked. All other time is paid at the Sunday rate.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at http://www.dir.ca.gov/OPRL/PWD. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the Internet at http://www.dir.ca.gov/OPRL/PWD. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1

FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #OPERATING ENGINEER (Multi-Shift)

DETERMINATION: SC-23-63-2-2014-1
ISSUE DATE: February 22, 2014
EXPIRATION DATE OF DETERMINATION: July 6, 2014** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within Imperial, Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara, and Ventura counties.

		Employer Payments					Straight – Time		Overtime Hourly Rate		
CLASSIFICATION (Journeyperson)	Basic Hourly Rate	Health and Welfare	Pension	Vacation/ Holiday (a)	Training	Other Payments	Hours (e)	Total Hourly Rate	Daily (c) 1 1/2X	Saturday (d) 1 1/2X	Sunday/ Holiday 2X
Classification Groups (b)											
Group 1	$39.20	$11.20	$7.45	$2.95	$0.80	$0.29	8	$61.89	$81.490	$81.490	$101.09
Group 2	$39.98	$11.20	$7.45	$2.95	$0.80	$0.29	8	$62.67	$82.660	$82.660	$102.65
Group 3	$40.27	$11.20	$7.45	$2.95	$0.80	$0.29	8	$62.96	$83.095	$83.095	$103.23
Group 4	$41.76	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.45	$85.330	$85.330	$106.21
Group 5	$41.86	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.55	$85.480	$85.480	$106.41
Group 6	$41.98	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.67	$85.660	$85.660	$106.65
Group 7	$42.08	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.77	$85.810	$85.810	$106.85
Group 8	$42.09	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.78	$85.825	$85.825	$106.87
Group 9	$42.19	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.88	$85.975	$85.975	$107.07
Group 10	$42.21	$11.20	$7.45	$2.95	$0.80	$0.29	8	$64.90	$86.005	$86.005	$107.11
Group 11	$42.31	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.00	$86.155	$86.155	$107.31
Group 12	$42.38	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.07	$86.260	$86.260	$107.45
Group 13	$42.48	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.17	$86.410	$86.410	$107.65
Group 14	$42.51	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.20	$86.455	$86.455	$107.71
Group 15	$42.59	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.28	$86.575	$86.575	$107.87
Group 16	$42.71	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.40	$86.755	$86.755	$108.11
Group 17	$42.88	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.57	$87.010	$87.010	$108.45
Group 18	$42.98	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.67	$87.160	$87.160	$108.65
Group 19	$43.09	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.78	$87.325	$87.325	$108.87
Group 20	$43.21	$11.20	$7.45	$2.95	$0.80	$0.29	8	$65.90	$87.505	$87.505	$109.11
Group 21	$43.38	$11.20	$7.45	$2.95	$0.80	$0.29	8	$66.07	$87.760	$87.760	$109.45
Group 22	$43.48	$11.20	$7.45	$2.95	$0.80	$0.29	8	$66.17	$87.910	$87.910	$109.65
Group 23	$43.59	$11.20	$7.45	$2.95	$0.80	$0.29	8	$66.28	$88.075	$88.075	$109.87
Group 24	$43.71	$11.20	$7.45	$2.95	$0.80	$0.29	8	$66.40	$88.255	$88.255	$110.11
Group 25	$43.88	$11.20	$7.45	$2.95	$0.80	$0.29	8	$66.57	$88.510	$88.510	$110.45

# Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet @ http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at http://www.dir.ca.gov/das/das.html.

[a] Includes an amount withheld for supplemental dues.

[b] For classifications within each group, see pages 8 and 9.

[c] Rate applies to the first 4 overtime hours. All other daily overtime is paid at the Sunday rate.

[d] Rate applies to the first 12 hours worked. All other time is paid at the Sunday rate.

[e] The Third Shift shall work 6.5 hours, exclusive of meal period, for which 8 hours straight-time shall be paid at the non-shift rate, Monday thorugh Friday.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at http://www.dir.ca.gov/OPRL/PWD. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

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STATE OF CALIFORNIA Edmund G. Brown Jr., *Governor*

DEPARTMENT OF INDUSTRIAL RELATIONS
Office of the Director – Research Unit
455 Golden Gate Avenue, 9th Floor
San Francisco, CA 94102

MAILING ADDRESS:
P. O. Box 420603
San Francisco, CA 94142-0603

PREDETERMINED INCREASES FOR

OPERATING ENGINEER (SC-23-63-2-2014-1)
OPERATING ENGINEER (MULTI-SHIFT) (SC-23-63-2-2014-1)
OPERATING ENGINEER (SPECIAL SHIFT) (SC-23-63-2-2014-1)

CRANES, PILE DRIVER AND HOISTING EQUIPMENT (OPERATING ENGINEER) (SC-23-63-2-2014-1B)
CRANES, PILE DRIVER AND HOISTING EQUIPMENT (OPERATING ENGINEER, MULTI-SHIFT) (SC-23-63-2-2014-1B1)
CRANES, PILE DRIVER AND HOISTING EQUIPMENT (OPERATING ENGINEER, SPECIAL SHIFT) (SC-23-63-2-2014-1B2)

TUNNEL (OPERATING ENGINEER) (SC-23-63-2-2014-1C)
TUNNEL (OPERATING ENGINEER) (SC-23-63-2-2014-1C1) (MULTI-SHIFT)

BUILDING/CONSTRUCTION INSPECTOR, FIELD SOILS AND MATERIAL TESTER, AND NON-DESTRUCTIVE TESTING (SC-23-63-2-2014-1D)
BUILDING/CONSTRUCTION INSPECTOR, FIELD SOILS AND MATERIAL TESTER, AND NON-DESTRUCTIVE TESTING (SPECIAL SHIFT) (SC-23-63-2-2014-1D1)
BUILDING/CONSTRUCTION INSPECTOR, FIELD SOILS AND MATERIAL TESTER, AND NON-DESTRUCTIVE TESTING (MULTI-SHIFT) (SC-23-63-2-2014-1D2)

ALL LOCALITIES WITHIN IMPERIAL, INYO, KERN, LOS ANGELES, MONO, ORANGE, RIVERSIDE, SAN BERNARDINO, SAN LUIS OBISPO, SANTA BARBARA, AND VENTURA COUNTIES

These predetermined increases for the above named crafts apply to the current determinations for work being performed on public works projects with bid advertisement dates on or after **March 4, 2014,** until these determinations are superseded by a new determination(s) or a predetermined increase modification notice becomes effective.

When referencing our prevailing wage determinations, please note that if the prevailing wage rate determination which was in effect on the bid advertisement date of a project has a single asterisk (*) after the expiration date, the rate will be good for the life of the project. However, if a prevailing wage rate determination has double asterisks (**) after the expiration date, the rate must be updated on the following date to reflect the predetermined rate change(s).

OPERATING ENGINEER: All Classifications and All Shifts
The above determinations are currently in effect and will expire on July 6, 2014**.

Effective on July 7, 2014, there will be an increase of $2.00 to be allocated to wages and/or fringes.
Effective on July 6, 2015, there will be an increase of $2.00 to be allocated to wages and/or fringes.

There will be no further increases applicable to these determinations.

Issued 2/22/2014, Effective 3/4/2014
This page will be updated when wage rate breakdown information becomes available.

Last Updated: March 4, 2014

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

LOCALITY: LOS ANGELES COUNTY
DETERMINATION: LOS-2014-1

		CRAFT (JOURNEY LEVEL)	ISSUE DATE	EXPIRATION DATE	EMPLOYER PAYMENTS: BASIC HOURLY RATE	HEALTH AND WELFARE	PENSION	VACATION/ HOLIDAY	TRAINING	OTHER PAYMENTS	STRAIGHT-TIME: HOURS	TOTAL HOURLY RATE	OVERTIME HOURLY RATE: DAILY	SATURDAY	SUNDAY AND HOLIDAY
#		**BRICKLAYER, STONEMASON,**													
		MARBLE MASON, CEMENT BLOCKLAYER, POINTER, CAULKER, CLEANER	02/22/2014	04/30/2014**	A 37.300	6.250	6.800	-	B 0.760	0.350	C 8.0	51.460	D 70.110	D 70.110	88.760
#		**BRICKLAYER:**													
		MASON FINISHER	02/22/2014	04/30/2014*	A 26.110	6.250	6.800	-	E 0.650	0.350	C 8.0	40.160	D 53.220	D 53.220	66.270
#	F	**BRICK TENDER**	02/22/2014	06/30/2014**	28.370	6.810	6.000 G	3.900	0.650	0.470	C 8.0	46.200	60.390	60.390	74.570
#		**BRICK TENDER:**													
		FORKLIFT OPERATOR	08/22/2013	06/30/2014**	28.820	6.810	6.000 G	3.900	0.650	0.470	C 8.0	46.650	61.060	61.060	75.470
#		**CARPET, LINOLEUM,**													
		RESILIENT TILE LAYER	02/22/2014	12/31/2014**	H 29.850	5.080	4.800	2.050	0.630	0.200	8.0	42.610	57.540 I	57.540	72.460
	J	MATERIAL HANDLER	02/22/2014	12/31/2014**	H 8.950	5.080	1.750	0.550	0.630	0.100	8.0	17.060	21.530 I	21.530	26.010
#		**DRYWALL FINISHER**													
	K	DRYWALL FINISHER	02/22/2014	09/30/2014**	L 29.900	7.050	4.620	3.070	0.670	0.470	8.0	45.780	60.730 M	60.730	75.680
		DRYWALL FINISHER	02/22/2014	09/30/2014**	H 34.030	7.050	4.620	3.070	0.670	0.470	8.0	49.910	66.920 M	66.920	83.940
#		**ELECTRICIAN:**													
		COMM & SYSTEM INSTALLER	02/22/2014	05/25/2014**	27.750	7.560	N 3.320	-	0.650	O 0.210	8.0	40.320	P 54.610	P 54.610	68.900
		COMM & SYSTEM TECH.	02/22/2014	05/25/2014**	29.550	7.560	N 3.320	-	0.650	O 0.210	8.0	42.180	P 57.390	P 57.390	72.610
		SOUND ELECTRICIAN	02/22/2014	05/25/2014**	30.550	7.560	N 3.320	-	0.650	O 0.210	8.0	43.210	P 58.940	P 58.940	74.670
		INSIDE WIREMAN, RADIO MONITOR TECHNICIAN	02/22/2014	06/30/2014*	39.450	10.740	Q 12.320 R	-	0.560	0.400	8.0	64.650	P 84.970	P 84.970	105.290
		CABLE SPLICER-WELDER	02/22/2014	06/30/2014*	41.420	10.740	Q 12.320 R	-	0.560	0.400	8.0	66.680	P 88.010	P 88.010	109.350
		TUNNEL WIREMAN	02/22/2014	06/30/2014*	43.400	10.740	Q 12.320 R	-	0.560	0.400	8.0	68.720	P 91.070	P 91.070	113.420
		TUNNEL CABLE SPLICER	02/22/2014	06/30/2014*	45.570	10.740	Q 12.320 R	-	0.560	0.400	8.0	70.960	P 94.430	P 94.430	117.890
		TRANSPORTATION SYSTEMS ELECTRICIAN	02/22/2014	06/30/2014*	39.200	10.740	Q 12.570 R	-	0.560	0.400	8.0	64.650	P 84.830	P 84.830	105.020
		TRANSPORTATION SYSTEMS ELECTRICIAN (CABLE SPLICING, WELDING, AND NETA TESTING)	02/22/2014	06/30/2014*	41.160	10.740	Q 12.570 R	-	0.560	0.400	8.0	66.660	P 87.860	P 87.860	109.060
	S	TRANSPORTATION SYSTEMS TECHNICIAN	02/22/2014	06/30/2014*	29.400	10.740	Q 12.570 R	-	0.560	0.400	8.0	54.550	P 69.690	P 69.690	84.830
#		**FIELD SURVEYOR:**													
	T	CHIEF OF PARTY (018.167-010)	02/22/2014	09/30/2014**	43.010	11.200	7.450 G	4.150	0.900	0.150	8.0	66.860	P 88.360	P 88.360	U 109.870
	T	INSTRUMENTMAN (018.167-034)	02/22/2014	09/30/2014**	40.510	11.200	7.450 G	4.150	0.900	0.150	8.0	64.360	P 84.610	P 84.610	U 104.870
	T	CHAINMAN/RODMAN (869.567-010)	02/22/2014	09/30/2014**	39.930	11.200	7.450 G	4.150	0.900	0.150	8.0	63.780	P 83.740	P 83.740	U 103.710
#		**GLAZIER**	02/22/2014	05/31/2014**	V 38.950 W	6.500	12.890 X	-	0.770	0.530	8.0	59.640	Y 78.120	Y 78.120	96.590
#		**MARBLE FINISHER**	08/22/2013	05/31/2014*	Z 27.880	7.940	2.710	-	0.810	0.330	AA 8.0	39.670	AB 53.610	AC 53.610	AD 67.550
#		**PAINTER:**													
	AE	PAINTER, LEAD ABATEMENT	08/22/2013	06/30/2014**	L 29.820	7.050	3.040	1.050	0.590	0.820	8.0	42.370	AF 57.280	AF 57.280	AF 57.280
	AE	REPAINT PAINTER, LEAD ABATEMENT	08/22/2013	06/30/2014**	L 26.490	7.050	3.040	1.050	0.590	0.820	8.0	39.040	AG 52.280	AG 52.280	AG 52.280
	AH	PAINTER, LEAD ABATEMENT	08/22/2013	06/30/2014**	L 25.630	7.050	3.040	1.050	0.590	0.820	8.0	38.180	AF 50.990	AF 50.990	AF 50.990

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FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

LOCALITY: LOS ANGELES COUNTY
DETERMINATION: LOS-2014-1

		CRAFT (JOURNEY LEVEL)	ISSUE DATE	EXPIRATION DATE	EMPLOYER PAYMENTS						STRAIGHT-TIME		OVERTIME HOURLY RATE					
					BASIC HOURLY RATE	HEALTH AND WELFARE	PENSION	VACATION/ HOLIDAY	TRAINING	OTHER PAYMENTS	HOURS	TOTAL HOURLY RATE	DAILY		SATURDAY		SUNDAY AND HOLIDAY	
	AH	REPAINT PAINTER, LEAD ABATEMENT	08/22/2013	06/30/2014**	L 23.490	7.050	3.040	1.050	0.590	0.820	8.0	36.040	AG	47.780	AG	47.780	AG	47.780
	AE	INDUSTRIAL PAINTER	02/22/2014	06/30/2014**	L 30.220	7.050	3.040	1.050	0.590	0.820	8.0	42.770	AF	57.880	AF	57.880	AF	57.880
	AE	INDUSTRIAL REPAINT PAINTER	08/22/2013	06/30/2014**	L 26.850	7.050	3.040	1.050	0.590	0.820	8.0	39.400	AG	52.830	AG	52.830	AG	52.830
#		**PLASTERER**	08/22/2013	07/31/2014*	30.910	8.380	4.210 AI	5.200	0.540	0.960	AJ 8.0	50.200		65.650	AK	65.650		81.110
#	AL	PLASTER TENDER	08/22/2013	08/05/2014*	30.000	6.810	5.400 AI	5.000	1.000	0.990	8.0	49.200		64.200	AM	64.200		79.200
		PLASTER CLEAN-UP LABORER	08/22/2013	08/05/2014*	27.450	6.810	5.400 AI	5.000	1.000	0.990	8.0	46.650		60.380	AM	60.380		74.100
#		**PLUMBER:**																
		PLUMBER, INDUSTRIAL AND GENERAL PIPEFITTER	08/22/2013	06/30/2014**	Z 40.570	7.760	AN 10.800 AO	3.030	1.600	AP 0.650	8.0	64.410	AQ	85.410	AQ	85.410		104.900
		SEWER AND STORM DRAIN PIPELAYER	08/22/2013	06/30/2014**	Z 31.500	7.650	AN 7.950 AO	1.000	1.330	AP 0.650	8.0	50.080		65.530	AA	65.530		80.480
	AR	SEWER AND STORM DRAIN PIPE TRADESMAN	08/22/2013	06/30/2014**	Z 16.410	7.650	0.380	-	0.760	AP 0.500	8.0	25.700		33.110	AA	33.110		40.510
		LANDSCAPE/IRRIGATION FITTER	02/22/2014	06/30/2014*	Z 26.070	7.760	AN 10.800 AO	2.490	0.990	AP 0.450	AA 8.0	48.560		62.840		62.840		75.880
	AS	LANDSCAPE/IRRIGATION TRADESMAN	02/22/2014	06/30/2014*	Z 13.040	2.000	AN 0.880	-	0.100	AP 0.450	AA 8.0	16.470		22.990		22.990		29.510
		REFRIGERATION SERVICE AND REPAIR (HVACR)	02/22/2014	08/31/2014**	H 41.190	8.130	AT 8.830 R	-	1.300	AU 0.560	8.0	60.010		80.600	AV	80.600	AD	100.050
		REFRIGERATION SERVICE AND REPAIR TRADESMAN (HVACR)	02/22/2014	08/31/2014*	H 10.900	8.130	1.400 R	-	0.500	AU 0.440	8.0	21.370		26.820	AV	26.820	AD	31.820
	AW	FIRE SPRINKLER FITTER (PROTECTION AND CONTROL SYSTEMS, OVERHEAD AND UNDERGROUND)	02/22/2013	03/31/2013*	33.030	8.420	AX 10.500	-	0.450	0.250	8.0	52.650		69.170		69.170		85.680
	AY	FIRE SPRINKLER FITTER (PROTECTION AND CONTROL SYSTEMS, OVERHEAD AND UNDERGROUND)	02/22/2014	08/31/2014*	40.610	8.670	14.000 R	-	1.350	AZ 0.550	8.0	65.180		85.490	BA	85.490		105.790
#		**ROOFER**	08/22/2013	07/31/2014**	BB 34.650	6.560	BC 5.590 X	-	0.400	BD 0.520	8.0	47.720	AQ	63.260	AQ	63.260		78.790
		PITCH WORK	08/22/2013	07/31/2014**	BB 36.400	6.560	BC 5.590 X	-	0.400	BD 0.520	8.0	49.470	AQ	65.880	AQ	65.880		82.290
		PREPARER	08/22/2013	07/31/2014**	BB 35.650	6.560	BC 5.590 X	-	0.400	BD 0.520	8.0	48.720	AQ	64.750	AQ	64.750		80.790
#	BE	**SHEET METAL WORKER**	02/22/2014	06/30/2014*	L 40.790	9.870	BF 11.910	-	1.120	0.470	8.0	64.160	BG	84.560	BG	84.560		104.950
#	BH	**SHEET METAL WORKER**	02/22/2014	06/30/2014**	H 31.080	9.870	BI 11.070	-	1.720	0.300	C 8.0	54.040	BJ	69.580	BJ	69.580	AD	85.120
	BH	LIGHT COMMERCIAL SHEET METAL WORKER UP TO AND INCLUDING 10,000 SQUARE FEET	02/22/2014	06/30/2014**	H 24.860	9.870	BI 11.070	-	1.720	0.300	C 8.0	47.820		60.250		60.250		60.250
#		**TERRAZZO FINISHER**	02/22/2014	08/31/2014**	H 26.590	7.010	3.210 R	-	0.490	0.120	AA 8.0	37.420	AB	50.720	AC	50.720	AD	64.010
#		**TERRAZZO WORKER**	02/22/2014	08/31/2014**	H 33.630	7.800	3.210 R	-	0.570	0.120	AA 8.0	45.330	AB	62.150	AC	62.150	AD	78.960
#		**TILE FINISHER**	08/22/2013	05/31/2014*	Z 23.260	7.380	1.800	-	0.750	0.330	AA 8.0	33.520	AB	45.150	AC	45.150	AD	56.780
#		**TILE LAYER**	08/22/2013	05/31/2014*	Z 34.390	8.040	5.560	-	0.900	0.330	AA 8.0	49.220	AB	66.420	AC	66.420	AD	83.610

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS

PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1

FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

LOCALITY: LOS ANGELES COUNTY

DETERMINATION: LOS-2014-1

	CRAFT (JOURNEY LEVEL)	ISSUE DATE	EXPIRATION DATE	INCREASE 1		INCREASE 2		INCREASE 3		INCREASE 4		INCREASE 5		INCREASE 6		INCREASE 7	
				DATE OF NEXT CHANGE	AMOUNT OF INCREASE	DATE OF NEXT CHANGE	AMOUNT OF INCREASE	DATE OF NEXT CHANGE	AMOUNT OF INCREASE	DATE OF NEXT CHANGE	AMOUNT OF INCREASE	DATE OF NEXT CHANGE	AMOUNT OF INCREASE	DATE OF NEXT CHANGE	AMOUNT OF INCREASE	DATE OF NEXT CHANGE	AMOUNT OF INCREASE
	BRICKLAYER, STONEMASON,																
	MARBLE MASON, CEMENT BLOCKLAYER, POINTER, CAULKER, CLEANER	02/22/2014	04/30/2014**	05/01/2014	$1.00 A	05/01/2015	$1.00 A										
B	**BRICK TENDER**	02/22/2014	06/30/2014**	07/01/2014	$0.75 A	07/01/2015	$1.00 A										
	BRICK TENDER:																
	FORKLIFT OPERATOR	08/22/2013	06/30/2014**	07/01/2014	$0.75 A	07/01/2015	$1.00 A										
	CARPET, LINOLEUM,																
	RESILIENT TILE LAYER	02/22/2014	12/31/2014**	01/01/2015	$1.00 C	01/01/2016	$0.50 D										
E	MATERIAL HANDLER	02/22/2014	12/31/2014**	01/01/2015	$0.35 F	01/01/2016	$0.18 G										
	DRYWALL FINISHER																
H	DRYWALL FINISHER	02/22/2014	09/30/2014**	10/01/2014	$1.65 A	10/01/2015	$1.91 A										
	DRYWALL FINISHER	02/22/2014	09/30/2014**	10/01/2014	$1.65 A	10/01/2015	$1.91 A										
	ELECTRICIAN:																
	COMM & SYSTEM INSTALLER	02/22/2014	05/25/2014**	05/26/2014	$0.60 A												
	COMM & SYSTEM TECH.	02/22/2014	05/25/2014**	05/26/2014	$0.60 A												
	SOUND ELECTRICIAN	02/22/2014	05/25/2014**	05/26/2014	$0.60 A												
	FIELD SURVEYOR:																
I	CHIEF OF PARTY (018.167-010)	02/22/2014	09/30/2014**	10/01/2014	$2.00 A	10/01/2015	$2.00 A										
I	INSTRUMENTMAN (018.167-034)	02/22/2014	09/30/2014**	10/01/2014	$2.00 A	10/01/2015	$2.00 A										
I	CHAINMAN/RODMAN (869.567-010)	02/22/2014	09/30/2014**	10/01/2014	$2.00 A	10/01/2015	$2.00 A										
	GLAZIER	02/22/2014	05/31/2014**	06/01/2014	$1.33 J	06/01/2015	$1.06 K	06/01/2016	$1.33 J								
	PAINTER:																
L	PAINTER, LEAD ABATEMENT	08/22/2013	06/30/2014**	07/01/2014	$1.00 M	07/01/2015	$1.00 M										
L	REPAINT PAINTER, LEAD ABATEMENT	08/22/2013	06/30/2014**	07/01/2014	$0.95 N	07/01/2015	$0.95 N										
O	PAINTER, LEAD ABATEMENT	08/22/2013	06/30/2014**	07/01/2014	$0.94 P	07/01/2015	$0.94 P										
O	REPAINT PAINTER, LEAD ABATEMENT	08/22/2013	06/30/2014**	07/01/2014	$0.90 Q	07/01/2015	$0.90 Q										
L	INDUSTRIAL PAINTER	02/22/2014	06/30/2014**	07/01/2014	$1.50 R	07/01/2015	$1.50 R										
L	INDUSTRIAL REPAINT PAINTER	08/22/2013	06/30/2014**	07/01/2014	$1.40 S	07/01/2015	$1.40 S										
	PLUMBER:																
	PLUMBER, INDUSTRIAL AND GENERAL PIPEFITTER	08/22/2013	06/30/2014**	07/01/2014	$1.61 A	07/01/2015	$1.65 A	07/01/2016	$2.02 A	07/01/2017	$2.43 A						
	SEWER AND STORM DRAIN PIPELAYER	08/22/2013	06/30/2014**	07/01/2014	$1.24 A	07/01/2015	$1.27 A	07/01/2016	$1.56 A	07/01/2017	$1.87 A						
T	SEWER AND STORM DRAIN PIPE TRADESMAN	08/22/2013	06/30/2014**	07/01/2014	$0.64 A	07/01/2015	$0.66 A	07/01/2016	$0.80 A	07/01/2017	$0.97 A						
	REFRIGERATION SERVICE AND REPAIR (HVACR)	02/22/2014	08/31/2014**	09/01/2014	$1.50 A												
	ROOFER	08/22/2013	07/31/2014**	08/01/2014	$1.37 U												
	PITCH WORK	08/22/2013	07/31/2014**	08/01/2014	$1.37 U												
	PREPARER	08/22/2013	07/31/2014**	08/01/2014	$1.37 U												
V	**SHEET METAL WORKER**	02/22/2014	06/30/2014**	07/01/2014	$0.90 A	01/01/2015	$1.05 A										

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS

PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1

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	CRAFT (JOURNEY LEVEL)	ISSUE DATE	EXPIRATION DATE	INCREASE 1		INCREASE 2		INCREASE 3		INCREASE 4		INCREASE 5		INCREASE 6		INCREASE 7	
				DATE OF NEXT CHANGE	AMOUNT OF INCREASE	DATE OF NEXT CHANGE	AMOUNT OF INCREASE	DATE OF NEXT CHANGE	AMOUNT OF INCREASE	DATE OF NEXT CHANGE	AMOUNT OF INCREASE	DATE OF NEXT CHANGE	AMOUNT OF INCREASE	DATE OF NEXT CHANGE	AMOUNT OF INCREASE	DATE OF NEXT CHANGE	AMOUNT OF INCREASE
V	LIGHT COMMERCIAL SHEET METAL WORKER UP TO AND INCLUDING 10,000 SQUARE FEET.	02/22/2014	06/30/2014**	07/01/2014	$0.72 A	01/01/2015	$0.84 A										
	TERRAZZO FINISHER	02/22/2014	08/31/2014**	09/01/2014	$1.50 A												
	TERRAZZO WORKER	02/22/2014	08/31/2014**	09/01/2014	$1.50 A												

Search

Home Labor Law Cal/OSHA Safety & Health Workers' Comp Self Insured Apprenticeship Director's Office Boards

Division of Apprenticeship Standards (DAS)

Division of Apprenticeship Standards Important Notice Changes to Code of Regulations Section 230.1

Notification of Change in Regulation 230.1

Regarding Employment of Apprentices on Public Works.

- Regulation 230.1 has been amended. The change will affect projects bid after June 30, 2009. Projects bid on or before June 30, 2009 will still be controlled by the prior version of 230.1
- The change requires all contractors (who are not already employing sufficient apprentices) to request dispatch (either consecutively or simultaneously) from all approved apprenticeship programs in the geographical area of the project.
- The change also requires that contractors who employ apprentices but are not meeting the required ratio for their craft must request dispatch from any other programs in their craft that exist in the geographical area of the project
- The change also requires contractors to give the approved apprenticeship programs written notice of the request for dispatch at least 72 hours in advance. Previously 48 hours advance notice was required.

Effective on projects bid July 1, 2009

Reg. 230.1 Employment of Apprentices on Public Works.
(a) Contractors, as defined in Section 228 to include general, prime, specialty or subcontractor, shall employ registered apprentice(s), as defined by Labor Code Section 3077, during the performance of a public work project in accordance with the required one hour of work performed by an apprentice for every five hours of labor performed by a journeyman, unless covered by one of the exemptions enumerated in Labor Code Section 1777.5 or this subchapter Unless an exemption has been granted, the contractor shall employ apprentices for the number of hours computed above before the end of the contract. Contractors who are not already employing sufficient registered apprentices (as defined by Labor Code Section 3077) to comply with the one-to-five ratio must request the dispatch of required apprentices from the apprenticeship committees providing training in the applicable craft or trade and whose geographic area of operation includes the site of the public work by giving the committee written notice of at least 72 hours (excluding Saturdays, Sundays and holidays) before the date on which one or more apprentices are required. If the apprenticeship committee from which apprentice dispatch(es) are requested does not dispatch apprentices as requested, the contractor must request apprentice dispatch(es) from another committee providing training in the applicable craft or trade in the geographic area of the site of the public work, and must request apprentice dispatch(es) from each such committee, either consecutively or simultaneously, until the contractor has requested apprentice dispatches from each such committee in the geographic area. All requests for dispatch of apprentices shall be in writing, sent by first class mail, facsimile or email. If a non-signatory contractor declines to abide by and comply with the terms of a local committee's standards, the apprenticeship committee shall not be required to dispatch apprentices to such contractor Conversely, if in response to a written request no apprenticeship committee dispatches, or agrees to dispatch during the period of the public works project any apprentice to a contractor who has agreed to employ and train apprentices in accordance with either the apprenticeship committee's standards or these regulations within 72 hours of such request (excluding Saturdays, Sundays and holidays) the contractor shall not be considered in violation of this section as a result of failure to employ apprentices for the remainder of the project, provided that the contractor made the request in enough time to meet the above-stated ratio. If an apprenticeship committee dispatches fewer apprentices than the contractor requested, the contractor shall be considered in compliance if the contractor employs those apprentices who are dispatched, provided that, where there is more than one apprenticeship committee able and willing to unconditionally dispatch apprentices, the contractor has requested dispatch from all committees providing training in the applicable craft or trade whose geographic area of operation include the site of the public work. Nothing in this section shall affect the right of a contractor who participates in and employs registered apprentices from programs approved under Labor Code Section 3075 outside the geographic area of the public work from employing said apprentice(s) on the site of the public work in order to meet the ratio requirement of Labor Code Section 1777.5.
(b) Apprentices employed on public works shall be paid the applicable apprentice prevailing per diem wage rate, available from DAS, and derived from the Director's survey of wages paid on public works in the geographic area of the craft or trade. DAS shall refer complaints alleging any contractor's failure to pay the proper apprentice prevailing wage rate on a public works project to the Division of Labor Standards Enforcement for investigation and appropriate action.
(c) Apprentices employed on public works can only be assigned to perform work of the craft or trade to which the apprentice is registered. Work of the craft or trade consists of job duties normally assigned to journeymen in the

Division of Apprenticeship Standards

Quick Links

Become an apprentice
Find an apprenticeship program
Find a registered apprentice
Train employees through apprenticeship
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Use apprentices on public works projects
I built it!
Apprenticeship Council meetings
DIR Laws and Regulations
Veterans

About DAS

About Us (Overview of DAS)
Contact
Locations

DAS Home

apprenticeable occupation. Where an employer employs apprentices under the rules and regulations of the California Apprenticeship Council, as set forth in Labor Code Section 1777.5(c) (2), apprentices employed on public works must at all times work with or under the direct supervision of journeyman/men. The on-the-job training shall be in accordance with the apprenticeship standards and apprenticeship agreement under which the apprentice is training, provided that a contractor shall not be subject to any financial or administrative obligations to a trust fund or employee benefit plan unless the contractor has so agreed.
(d) The provisions of this regulation shall not apply to contractors on public works projects that were bid prior to July 1, 2009. Such contractors shall comply with the version of this regulation that was in effect prior to July 1, 2009.

Note: Authority cited: Section 1777.7, Labor Code. Reference: Section 1777.5, Labor Code.

March 2014

PART G

PROJECT SPECIFICATIONS

Table of Contents
Pueblo Park
Torrance, California

Division 0 – General Requirements
00010 Table of Contents
00020 Consultant List

Division 1 – General Requirements
01050 Field Engineering
01250 Contract Modification Procedures
01290 Payment Procedures
01310 Project Management and Coordination
01320 Construction Progress Documentation
01330 Submittal Procedures
01400 Quality Requirements
01420 References
01500 Temporary Facilities and Controls
01600 Product Requirements
Form: Substitute Request
01700 Execution Requirements
01731 Cutting and Patching
01770 Closeout Procedures

Division 2 – Site Work
02010 Subsurface Exploration
02200 Site Preparation
02230 Site Clearing
02300 Earthwork
02630 Storm Drainage
02751 Cement Concrete Paving
02810 Irrigation
02870 Site Furnishings
02900 Exterior Planting
02935 Maintenance of Planting

Division 3 –Concrete
03350 Pre-Cast Concrete Building

Division 4 –Masonry
04420 Concrete Unit Masonry

Division 5 –Metal
05500 Metal Fabrications

Division 5 –Metal (Continued)

05560 Miscellaneous Metals

Division 16 –Electrical

16010 Electrical General Provisions
16050 Basic Electrical Materials and Methods
16110 Conduit and Wire
16500 Exterior Lighting

Consultant List

Landscape Architect
Land Concern
1750 East Deere Avenue
Santa Ana, CA 92705
(949) 250-4822

Irrigation Consultant
Water Concern
29829 Santa Margarita Parkway, Suite 200
Rancho Santa Margarita, CA 92688
(949) 635-0474

Civil Engineer
Civil Design and Drafting, Inc.
885 Patriot Drive, Unit C
Moorpark, CA 93021
(805) 522-2622

Structural Engineer
ESI/FME, Inc.
1800 E. 16th St., Unit B
Santa Ana, CA 927401
(714) 835-2800

Agronomist
Soil and Plant Laboratory
4741 Hunter Avenue, Suite A
Anaheim, CA 92807
(714) 282-8777

Lighting Consultant
Visual Concepts, Inc.
7343 Ronson Road, Suite C
San Diego, CA 92111
(858) 278-4503

SECTION 01050 - FIELD ENGINEERING

PART 1 - GENERAL

1.01 SUMMARY

A. Provide materials, labor, and equipment necessary for the completion of field engineering as indicated on the drawings and specified herein.

1.02 GENERAL

A. Project Record Documents: Submit a record of Work performed and record survey data required under provisions of Sections "Submittals" and "Project Closeout".

B. Surveyor: Engage a Land Surveyor registered in the State where the Project is located, to perform land surveying required.

C. Verify layout information shown on the Drawings, in relation to the property survey and existing benchmarks before proceeding to layout the Work. Protect existing benchmarks and control points. Preserve permanent reference points during construction.

1. Do not change or relocate benchmarks or control points without prior written approval. Report lost or destroyed reference points, or requirements to relocate reference points because of necessary changes in grades or locations.

2. Promptly replace lost or destroyed project control points. Base replacements on the original survey control points.

D. Existing Utilities and Equipment: The existence and location of underground utilities and construction indicated as existing are not guaranteed. Before beginning site work, verify the existence and location of underground utilities and other construction.

1. Prior to construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer and water service piping.

E. Performance: Working from lines and levels established by the property survey, establish benchmarks and markers to set lines and levels where needed to properly locate each element. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.

1. Advise entities engaged in construction activities, of marked lines and levels provided for their use. As construction proceeds, check every major element for line, level and plumb.

F. Surveyor's Log: Maintain a surveyor's log of control and other surveys. Make this log available for reference.

1. Record deviations from required lines and levels. Advise the Landscape Architect when deviations that exceed indicated or recognized tolerances are detected. On record Drawings, record deviations that are accepted and not corrected.

G. Site Improvements: Locate and layout site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes and invert elevations by instrumentation and similar appropriate means.

H. Existing Utilities: Furnish information necessary to adjust, move or relocate existing structures, utility poles, lines, services or other appurtenances located in, or affected by construction. Coordinate with local authorities having jurisdiction.

I. Final Property Survey: Before Substantial Completion, prepare a final property survey showing significant features for the Project. Include a certification, signed by the Surveyor, to the effect that metes, bounds, lines and levels of the Project are accurately positioned as shown on the survey.

    1. Recording: At Substantial Completion, have the final survey recorded by or with local authorities as the official "property survey".

END OF SECTION

SECTION 01250 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

B. See Division 1 Section "Allowances" for procedural requirements for handling and processing allowances.

C. See Division 1 Section "Unit Prices" for administrative requirements for using unit prices.

1.2 MINOR CHANGES IN THE WORK

A. Landscape Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.3 PROPOSAL REQUESTS

A. Owner or Landscape Architect Initiated Change Notices herein referred to as Bulletins: Landscape Architect will issue a detailed description of proposed changes in the Work, including a typed itemized outline summary that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Bulleting which is unexecuted by the Owner and issued by Landscape Architect is for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
2. Within 20 days, or time specified in the Bulletin, after receipt of the Bulletin, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

3. Bulletins shall contain a clause which, if executed by the Owner, will request action of the Contractor in addition to the pricing described in Paragraph 2. Bulletins SD executed will be acted on by the Contractor in the manner indicated. Bulletins will include the following possible actions, will indicate the cause for each proposed change such as: Design Error; Design Omission; City or other agency Permitting Requirement, Owner Request; Contractor or Subcontractor Requirement, and will be signed by the parties responsible for the change:

    a. Price Only
    b. Price and Proceed on a Time and Material Basis with the Work Necessary to Maintain Schedule

c. No Action Required
d. Proceed on a Time and Materials or Lump Sum Basis as Indicated

B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
5. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

C. Proposal Request Form: Use AIA Document 8709

1.4 ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, base each Change Order proposal on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

1. Include installation costs in purchase amount only where indicated as part of the allowance.
2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the Purchase Order amount or Contractor's handling, labor, installation, overhead, and profit. Submit claims within 21 days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. Owner will reject claims submitted later than 21 days after such authorization.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.

2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of the pricing for a Bulletin, Contractor will issue a Change Order for signatures of Owner, the Landscape Architect and Contractor on AIA Document G701 consistent with pricing provided.

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Landscape Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01290 - PAYMENT PROCEDURES
PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.2 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including Submittals Schedule and Application for Payment forms with Continuation Sheets.
2. Submit the Schedule of Values to Landscape Architect at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
3. Sub schedules: Where the Work is separated into phases requiring separately phased payments, provide sub schedules showing values correlated with each phase of payment.

B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the Schedule of Values:
   a. Project name and location.
   b. Name of Landscape Architect.
   c. Landscape Architect's project number.
   d. Contractor's name and address.
   e. Date of submittal.

2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
   a. Related Specification Section or Division.
   b. Description of the Work.
   c. Name of subcontractor.
   d. Name of manufacturer or fabricator.
   e. Name of supplier.
   f. Change Orders (numbers) that affect value.
   g. Dollar value.

1) Percentage of the Contract Sum to nearest percent, adjusted to total 100 percent.

3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. Allowances; Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
8. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
9. Schedule Updating; Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.3 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Landscape Architect and paid for by Owner.
    1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times; The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Times; The date for each progress payment is the 5th day of each month. The period covered by each Application for Payment starts on the day following the end of the preceding period and ends 5 days before the date for each progress payment.

D. Payment Application Forms; Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.

E. Application Preparation; Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Landscape Architect will return incomplete applications without action.
    1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
    2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

F. Transmittal; Submit 3 signed and notarized original copies of each Application for Payment to Landscape Architect by a method ensuring receipt within 24 hours. One copy shall include original waivers of lien and similar attachments if required.

    1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for amount requested, before deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Waiver Delays: Submit each Application for Payment with Contractor's waiver of mechanic's lien for construction period covered by the application.

    a. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application that is lawfully entitled to a lien.

H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of Values.
3. Contractor's Construction Schedule (preliminary if not final).
4. Submittals Schedule (preliminary if not final).
5. List of Contractor's staff assignments.
6. Copies of building permits.
7. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
8. Certificates of insurance and insurance policies.
9. Performance and payment bonds (if required).
10. Data needed to acquire Owner's insurance.

I. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

J. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AlA Document G706, "Contractor's Affidavit of Payment of Debts and Claims." AlA Document G706A. "Contractor's Affidavit of Release of Liens." AlA Document G707, "Consent of Surety to Final Payment." Evidence that claims have been settled.
5. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01310 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General Project coordination procedures.
2. Coordination Drawings.
3. Project meetings.

B. See Division 1 Section "Summary of Multiple Contracts" for a description of the division of Work among separate contracts and responsibility for coordination activities not in this Section.

C. See Division 1 Section "Execution Requirements" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.2 COORDINATION

A. Coordination: Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, which depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. If necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Pre-installation conferences.
7. Project closeout activities.

1.3 SUBMITTALS

A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.

1. Indicate relationship of components shown on separate Shop Drawings.
2. Indicate required installation sequences.
3. See Division 15 Section "Basic Mechanical Materials and Methods" for specific Coordination Drawing requirements for mechanical installations.
4. See Division 16 Section "Basic Electrical Materials and Methods" for specific Coordination Drawing requirements for electrical installations.

1.4 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Landscape Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Landscape Architect, within 3 days of the meeting.

B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Landscape Architect, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner, Landscape Architect, and their consultants;
Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Discuss items of significance that could affect progress, including the following:

a. Tentative construction schedule.
b. Phasing.
c. Critical work sequencing.
d. Designation of responsible personnel.
e. Procedures for processing field decisions and Change Orders.
f. Procedures for processing Applications for Payment.
g. Distribution of the Contract Documents.
h. Submittal procedures.
i. Preparation of Record Documents.
j. Use of the premises.
k. Responsibility for temporary facilities and controls.

l. Parking availability.
m. Office, work, and storage areas.
n. Equipment deliveries and priorities.

o. First aid.
p. Security.
q. Progress cleaning.
r. Working hours.

C. Pre-installation Conferences: Conduct a pre-installation conference at Project site before each construction activity that requires coordination with other construction.
   1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination Or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Landscape Architect of scheduled meeting dates.
   2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
      a. Contract Documents.
      b. Options.
      c. Related Change Orders.
      d. Purchases.
      e. Deliveries.
      f. Submittals.
      g. Review of mockups.
      h. Possible conflicts.
      i. Compatibility problems.
      j. Time schedules.
      k. Weather limitations.
      l. Manufacturer's written recommendations.
      m. Warranty requirements.
      n. Compatibility of materials.
      o. Acceptability of substrates.
      p. Temporary facilities and controls.
      q. Space and access limitations.
      r. Regulations of authorities having jurisdiction.
      s. Testing and inspecting requirements.
      t. Required performance results.
      u. Protection of construction and personnel.

   3. Record significant conference discussions, agreements, and disagreements.
   4. Do not proceed with installation if the conference cannot be successfully concluded.

Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Conduct progress meetings at weekly intervals. Coordinate dates of meetings with preparation of payment requests. Prepare and distribute minutes of meeting to record all discussions and actions.

   1. Attendees: In addition to representatives of Owner and Landscape Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented as required at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    b. Review present and future needs of each entity present, including the following:

        1) Interface requirements.
        2) Sequence of operations.
        3) Status of submittals.
        4) Deliveries.
        5) Off-site fabrication.
        6) Access.
        7) Site utilization.
        8) Temporary facilities and controls.
        9) Work hours.
        10) Hazards and risks.
        11) Progress cleaning.
        12) Quality and work standards.
        13) Change Orders.
        14) Documentation of information for payment requests.

3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.

    a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Contractor's Construction Schedule.
2. Submittals Schedule.
3. Daily construction reports.
4. Field condition reports.
5. Construction photographs

B. See Division 1 Section "Payment Procedures" for submitting the Schedule of Values.

C. See Division 1 Section "Closeout Procedures" for submitting photographic negatives as Project Record Documents at Project closeout.

1.2 DEFINITIONS

A. Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall Project duration and contains no float.

B. Float: The measure of leeway in starting and completing an activity.

1. Float time belongs to Owner

C. Fragment: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

D. Major Area: A significant construction element.

E. Milestone: A significant event on the Critical Path.

1.3 SUBMITTALS

A. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:

1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Landscape Architect's final release or approval.

B. CPM Reports: Concurrent with CPM schedule, submit three printed copies of each of the following computer-generated reports. Format for each activity in reports shall contain activity number, activity description, original duration, actual start, actual completion, remaining duration, early start date, early finish date, late start date, late finish date, and total float.

1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.

3. Total Float Report: List of all activities sorted in ascending order of total float.

C. Construction Photographs: Submit digital (jpeg format) of each photographic view within day of taking photographs.

D. Daily Construction Reports: Submit two copies at monthly intervals.

E. Field Condition Reports: Submit two copies at time of discovery of differing conditions.

1.4 QUALITY ASSURANCE

A. Photographer Qualifications: Photographs shall be in digital format and good quality to convey desired information and be capable of electronic distribution

1.5 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

C. Auxiliary Services: Cooperate with photographer and provide auxiliary services requested, including access to Project site and use of temporary facilities including temporary lighting.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, re-submittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
2. Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for the Notice to proceed to date of Final Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Landscape Architect.
2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.

    a. Transformers and Switchgear
    b. Light Fixtures
    c. Stone
    d. Paving Material

3. Submittal Review Time: Include review and re-submittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
4. Startup and Testing Time: Include not less than 3 days for startup and testing.
5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Landscape Architect's administrative procedures necessary for certification of Substantial Completion.

C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
2. Work under More Than One Contract: Include a separate activity for each contract.
3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
4. Work Restrictions: Show the effect on the schedule of the following:

    a. Coordination with existing construction.
    b. Limitations of continued occupancies.
    c. Uninterruptible services.
    d. Use of premises restrictions.
    e. Provisions for future construction.
    f. Seasonal variations.
    g. Environmental control.

D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Building Dry-In, Conditioned Air, Substantial Completion, and Final Completion.

E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragments to demonstrate the effect of the proposed change on the overall project schedule.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

A. General: Prepare network diagrams using AON (activity-an-node) format.

B. Preliminary Network Diagram: Submit diagram within 14 days of date established for the Notice to Proceed. Outline significant construction activities for the first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

C. CPM Schedule: Prepare Contractor's Construction Schedule using a CPM network analysis diagram.

1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 30 days after date established for the Notice of Award.
2. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
3. Use "one workday" as the unit of time.

D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.

1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following:

    a. Preparation and processing of submittals.
    b. Purchase of materials.
    c. Delivery.
    d. Fabrication.
    e. Installation.

2. Processing: Process data to produce output data or a computer-orawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.

3. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.

    a. Sub-networks on separate sheets are permissible for activities clearly off the critical path.

E. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start total float" sort. Identify critical activities. Prepare tabulated reports showing the following:

1. Contractor or subcontractor and the Work or activity.
2. Description of activity.
3. Principal events of activity.
4. Immediate preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in workdays.
8. Total float or slack time.
g. Average size of workforce.

F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

1. Identification of activities that have changed.
2. Changes in early and late start dates.
3. Changes in early and late finish dates.
4. Changes in activity durations in workdays.
5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.

G. Look-Ahead Schedule

1. Deliver at each weekly Progress Meeting a schedule projecting three weeks into the future and listing all activities to be constructed during that period. This schedule is to

include those activities which were scheduled to be but not completed during the previous reporting period.

2.4 REPORTS

A. Daily Construction Reports: Prepare a daily construction report, to be forwarded to the Owner and Landscape Architect on a weekly basis, recording events at Project site, including the following:

1. List of subcontractors.
2. High and low temperatures and general weather conditions.
3. Accidents.
4. Stoppages, delays, shortages, and losses.
5. Meter readings and similar recordings.
6. Orders and requests of authorities having jurisdiction.
7. Services connected and disconnected.
8. Equipment or system tests and startups.

B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit with a request for information on CSI Form 13.2A Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule three days before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate Actual Completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Landscape Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

3.2 CONSTRUCTION PHOTOGRAPHS

A. Photographer: Photographs shall be in digital format and of good quality as to convey desired information. Photographs are to be taken at a minimum of weekly intervals.

END OF SECTION

SECTION 01330 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

B. See Division 1 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule and construction photographs.

C. See Division 1 Section "Quality Requirements" for submitting test and inspection reports and Delegated-Design Submittals and for erecting mockups.

D. See Division 1 Section "Closeout Procedures" for submitting warranties Project Record Documents and operation and maintenance manuals.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Landscape Architect's responsive action.

B. Informational Submittals: Written information that does not require Landscape Architect's approval. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

a. Landscape Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

B. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.

C. Processing Time: Allow enough time for submittal review, including time for re-submittals, as follows. Time for review shall commence on Landscape Architect's receipt of submittal.

1. Initial Review: Allow 5 days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Landscape Architect will advise Contractor when a submittal being processed must be delayed for coordination.

2. If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Allow 5 days for processing each re-submittal.
4. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.

D. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 4 by 5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Landscape Architect.
3. Include the following information on label for processing and recording action taken:

a. Project name.
b. Date.
c. Name and address of Landscape Architect.
d. Name and address of Contractor.
e. Name and address of subcontractor.
f. Name and address of supplier.
g. Name of manufacturer.
h. Unique identifier, including revision number.
i. Number and title of appropriate Specification Section.
j. Drawing number and detail references, as appropriate.
k. Other necessary identification.

E. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.

F. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Landscape Architect will return submittals, without review if received from sources other than Contractor.

1. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
2. Transmittal Form: Use AIA Document G810

G. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

H. Use for Construction: Use only final submittals with mark indicating action taken by Landscape Architect in connection with construction.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

1. Number of Copies: Submit 1 reproducible and two blueline copies of each submittal, unless otherwise indicated. Landscape Architect will return reproducible and 1 blueline copy. Mark up and retain one returned copy as a Project Record Document.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

    a. Manufacturer's written recommendations.
    b. Manufacturer's product specifications.
    c. Manufacturer's installation instructions.
    d. Manufacturer's catalog cuts.
    e. Wiring diagrams showing factory-installed wiring.
    f. Printed performance curves.
    g. Operational range diagrams.
    h. Compliance with recognized trade association standards.
    i. Compliance with recognized testing agency standards.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Include the following information, as applicable:
    a. Dimensions.
    b. Identification of products.
    c. Fabrication and installation Drawings.
    d. Roughing-in and setting diagrams.
    e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
    f. Shop work manufacturing instructions.
    g. Templates and patterns.
    h. Schedules.
    i. Notation of coordination requirements.
    j. Notation of dimensions established by field measurement.

2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
3. Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 81/2 x 11 inches but no larger than 30x42 inches

D. Coordination Drawings: Comply with requirements in Division 1 Section "Project Management and Coordination."

E. Samples: Prepare physical units of materials or products, including the following:

1. Comply with requirements in Division 1 Section "Quality Requirements" for mockups.
2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
    a. Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Landscape Architect will return submittal with options selected.
3. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, partial sections of manufactured or fabricated components; small cuts or containers of

materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

a. Submit three sets of Samples. Landscape Architect will retain two Sample sets; remainder will be returned.

4. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Landscape Architect's sample where so indicated. Attach label on unexposed side.
5. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between final submittal and actual component as delivered and installed.
6. Disposition: Maintain sets of approved Samples at Project site, available for quality control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

F. Product Schedule or List: Prepare a written summary indicating types of products required for the Work and their intended location.

G. Delegated-Design Submittal: Comply with requirements in Division 1 Section "Quality Requirements."

H. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."

I. Application for Payment: Comply with requirements in Division 1 Section "Payment Procedures."

J. Schedule of Values: Comply with requirements in Division 1 Section "Payment Procedures."

K. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Landscape Architect will not return copies.
2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
3. Test and Inspection Reports: Comply with requirements in Division 1 Section "Quality Requirements."

B. Contractor's Construction Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."

C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of Landscape Architects and owners, and other information specified.

D. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.

E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project

G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.

H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.

I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.

J. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

K. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.

L. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

M. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.

N. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Division 1 Section "Closeout Procedures."

O. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

P. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.

Q. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections.

R. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

S. Construction Photographs: Comply with requirements in Division 1 Section "Construction Progress Documentation."

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Landscape Architect.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 LANDSCAPE ARCHITECTS ACTION

A. General: Landscape Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

1. Action Submittals: Landscape Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Landscape Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken.

2. The process of review of the Contractors submittals is not for the purpose of testing the Landscape Architect's perception. If deviations, discrepancies or conflicts between the submittals and the Contract Documents are discovered, either prior to or after the submittals are processed by the Landscape Architect, the Contractor aggress that the Contract Documents shall control and be followed.

B. Informational Submittals: Landscape Architect will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Landscape Architect will forward each submittal to appropriate party.

C. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

END OF SECTION

SECTION 01400 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.
2. Requirements for Contractor to provide quality-control services required by Landscape Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

C. See Divisions 2 through 16 Sections for specific test and inspection requirements.

1.2 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Landscape Architect.

C. Mockups: Full-size, physical example assemblies to illustrate finishes and materials. Mockups are used to verify selections made under Sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Mockups establish the standard by which the Work will be judged.

D. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.3 DELEGATED DESIGN

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Landscape Architect.

1.4 SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

C. Reports: Prepare and submit certified written reports that include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Ambient conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and re-inspecting.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.

F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade-union jurisdictional settlements and similar conventions.

G. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.

H. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Landscape Architect.
2. Notify Landscape Architect seven days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Landscape Architect's approval of mockups before starting work, fabrication, or construction.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed, unless otherwise indicated.

1.6 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.

2. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

   a. Contractor shall not employ the same entity engaged by Owner, unless agreed to in writing by Owner.

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Special Tests and Inspections: Owner will engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.

1. Testing agency will notify Landscape Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
2. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to Landscape Architect with copy to Contractor and to authorities having jurisdiction.
3. Testing agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
4. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
5. Testing agency will retest and re-inspect corrected work.

D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.

E. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.

F. Testing Agency Responsibilities: Cooperate with Landscape Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Landscape Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
5. Do not perform any duties of Contractor.

G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel.
Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field-curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.
2. Comply with the Contract Document requirements for Division 1 Section "Cutting and Patching."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01420 - REFERENCES

A. PART - GENERAL

1. DEFINITIONS

A. General: Basic Contract definitions are included in the General Conditions of the Contract for Construction.

B. "Approved": The term "approved," when used to convey Landscape Architect's action on Contractor's submittals, applications, and requests, is limited to Landscape Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by Landscape Architect, requested by Landscape Architect, and similar phrases.

D. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on Drawings or to other paragraphs or schedules in Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference.

E. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": The term "furnish" means to supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": The term "install" describes operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.

I. "Installer": An installer is the Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

J. The term "experienced," when used with an entity, means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

K. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

L. "Project site" is the space available for performing construction activities. The extent of Project site is shown on Drawings and mayor may not be identical with the description of the land on which Project is to be built.

2. INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards *have* the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.

C. Conflicting Requirements: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Landscape Architect for a decision before proceeding.

    a. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Landscape Architect for a decision before proceeding.

D. Copies of Standards: Each entity engaged in construction on Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

    a. Where copies of standards are needed to perform a required construction *activity,* obtain copies directly from publication source and make them available on request.

E. Abbreviations and Acronyms for Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale Research's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."

    a. Abbreviations and Acronyms for Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ACI: American Concrete Institute, Box 19150, Redford Station, Detroit, MI 48219.

AISC: American Institute of Steel Construction, Inc., 400 North Michigan Avenue, Chicago, IL 60611.

ANSI: American National Standards Institute, 1430 Broadway, New York, NY 10018.

ASTM: American Society for Testing and Materials, 1916 Race Street, Philadelphia PA 19103.

FM: Factory Mutual Engineering and Research, 1151 Boston-Providence Turnpike, Norwood, MA 02062.

HI: Hydronics Institute, 35 Russo Place, Berkeley Heights, NJ 07922.

ICBO: International Congress of Building Officials, 5360 South Workman Mill Road, Whittier, CA 90601.

IES: Illuminating Engineering Society of North America, 345 East 47th Street, New York, NY 10017.

NFPA: National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

TCA: Tile Council of America, 100 Clemson Research Boulevard, Anderson, SC 29625

UL: Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062.

WCLB: West Coast Lumber Inspection Bureau, Southwest Varns Street, Portland, OR 97223.

WIC: Woodwork Institute of California, 3164 Industrial Boulevard, PO Box 980247, West Sacramento, CA 95798

WWPA: Western Wood Products Association, 1500 Yeon Building, Portland, OR 92704.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.

1.2 USE CHARGES

A. General: Cost or use charges for temporary facilities are not chargeable to Owner or Landscape Architect and shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces occupants of Project Landscape Architect testing and inspecting agencies and personnel of authorities having jurisdiction.

B. Water Service: Provide temporary water and any related piping for site work until such time as meter is set.

C. Electric Power Service: Provide temporary lighting, power distribution and metering for Work of this contract. Use of Owner's electrical service will not be permitted without Owner's written permission.

1.3 SUBMITTALS

A. Temporary Utility Reports: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.

1.4 QUALITY ASSURANCE

A. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA241.

1. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

A. Temporary Utilities: Change over from use of temporary service to use of permanent service, upon written notice and approval from Owner.

1. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:

1. Keep temporary services and facilities clean and neat.
2. Relocate temporary services and facilities as required by progress of the Work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Landscape Architect. Provide materials suitable for use intended, or as required by local agency or regulations having jurisdiction

B. Pavement: Comply with Division 2 pavement Sections.

C. Tarpaulins: Fire-resistive labeled with flame-spread rating of 15 or less.

D. Water: Potable.

2.2 EQUIPMENT

A. Field Offices: Prefabricated, mobile units, or job-built construction with lockable entrances, operable windows, and serviceable finishes; heated and air conditioned; on foundations adequate for normal loading.

B. Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA-recommended classes for exposures.

1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

C. Self-Contained Toilet Units: Single-occupant units of chemical, aerated re-circulation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material. Use of new toilet facilities may not be used with out written permission of Owner.

D. Drinking-Water Fixtures: Drinking-water fountains Containerized, tap-dispenser, bottled water, drinking-water units, including paper cup supply.

1. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg F. Revise first paragraph and subparagraphs below to suit Project. Liquid-propane-gas or fuel-oil heaters are commonly used. Steam or hot water heaters, gas-fired space heaters, or electric unit heaters are also used.

E. Heating Equipment: Unless Owner authorizes use of permanent heating system; provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating Units: Listed and labeled, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use for type of fuel being consumed.

F. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.
G. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Engage appropriate local utility company to install temporary service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked-in services.
3. Obtain easements to bring temporary utilities to Project site where Owner's easements cannot be used for that purpose.

B. Sewers and Drainage: Provide temporary connections to remove effluent that can be discharged lawfully.

1. Filter out excessive soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.
2. Connect temporary sewers to municipal system as directed by sewer department officials.
3. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. After heavy use, restore normal conditions promptly.
4. Provide temporary filter beds, settlement tanks, separators, and similar devices to purify effluent to levels acceptable to authorities having jurisdiction.

C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction until permanent water service is in use. Sterilize temporary water piping before use.

D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
2. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy.
3. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel who handle materials that require wash up. Dispose of drainage properly. Supply cleaning compounds appropriate for each type of material handled.

a. Provide safety showers, eyewash fountains, and similar facilities for convenience, safety, and sanitation of personnel.

4. Drinking-Water Facilities: Provide bottled-water, drinking-water units.

a. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg F.

E. Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnecting means, automatic ground-fault interrupters, and main distribution switchgear.

F. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.

1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.

G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
2. Provide one 1OO-W incandescent lamp per 500 sq. ft. uniformly distributed, for general lighting, or equivalent illumination.
3. Provide one 1OO-W incandescent lamp every 50 feet in traffic areas.
4. Provide one 1OO-W incandescent lamp per story in stairways and ladder runs, located to illuminate each landing and flight.
5. Install exterior-yard site lighting that will provide adequate illumination for construction operations, traffic conditions, and signage visibility when the Work is being performed.

H. Telephone Service:

1. Provide additional telephone lines for the following:
2. At each telephone, post a list of important telephone numbers, including police and fire departments ambulance service, Contractor's home office, Landscape Architect's office, Engineers' offices, Owner's office, and principal subcontractors' field and home offices.
3. Provide an answering machine on superintendent's telephone.
4. Provide a portable cellular telephone for superintendent's use in making and receiving telephone calls when away from field office.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.
2. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet of building lines. Comply with NFPA 241.

3. Maintain support facilities until Substantial Completion. Remove upon Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate to support loads and to withstand exposure to traffic during construction period. Locate temporary roads and paved areas in same location as permanent roads and paved areas. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations. Coordinate temporary roads and paved area with local Fire Department and other agencies having jurisdiction.

1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
2. Prepare sub-grade and install sub-base and base for temporary roads and paved areas according to Division 2 Section "Earthwork."
3. Recondition base after temporary use, including removing contaminated material, re-grading, proof-rolling, compacting, and testing.
4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course according to Division 2 Section "Hot-Mix Asphalt Paving."

C. Dewatering Facilities and Drains: Comply with requirements in applicable Division 2 Sections for temporary Drainage and dewatering facilities and operations not directly associated with construction activities included in individual Sections. Where feasible, use same facilities. Maintain Project site, excavations, and construction free of water.

D. Project Identification and Temporary Signs: Prepare Project identification and other signs in sizes indicated. Install signs where indicated to inform public and persons seeking entrance to Project. Do not permit installation of unauthorized signs.

1. Engage an experienced sign painter to apply graphics for Project identification signs. Comply with details indicated.
2. Prepare temporary signs to provide directional information to construction personnel and visitors.

E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Comply with Division 1 Section "Execution Requirements" for progress cleaning requirements.

1. If required by authorities having jurisdiction, provide separate containers, clearly labeled, for each type of waste material to be deposited.
2. Develop a waste management plan for Work performed on Project. Indicate types of waste materials Project will produce and estimate quantities of each type. Provide detailed information for on-site waste storage and separation of recyclable materials. Provide information on destination of each type of waste material and means to be used to dispose of all waste materials.

F. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility services. Sheds may be open shelters or fully enclosed spaces within building or elsewhere on-site.

1. Construct framing, sheathing, and siding using fire-retardant-treated lumber and plywood.

G. Lifts and Hoists: Provide facilities for hoisting materials and personnel. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects. Avoid using tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near Project site.

B. Storm water Control: Provide earthen embankments and similar barriers in and around excavations and sub-grade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.

C. Tree and Plant Protection: When indicated on contract Drawings, install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from construction damage. Protect tree root systems from damage, flooding, and erosion.

D. Pest Control: Before deep foundation work has been completed, retain a local exterminator or pest-control company to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests. Engage this pest-control service to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials.

E. Site Enclosure Fence: Before construction operations begin install enclosure fence with lockable entrance gates. Locate where indicated, or enclose entire Project site or portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs, and other animals from easily entering site except by entrance gates.

    1. Set fence posts in compacted mixture of gravel and earth.
    2. Set portable chain-link fence posts in concrete bases.
    3. Provide gates in sizes and at locations necessary to accommodate delivery vehicles and other construction operations.
    4. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Provide Owner with one set of keys.

F. Security Enclosure and Lockup: Site security is solely responsibility of Contractor

G. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.

H. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weather tight enclosure for building exterior.

    1. Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
    2. Vertical Openings: Close openings of 25 sq. ft. or less with plywood or similar materials.
    3. Horizontal Openings: Close openings in floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.

4. Install tarpaulins securely using fire-retardant-treated wood framing and other materials.

I. Temporary Partitions: Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.

1. Construct dustproof partitions of not less than nominal 4-inch studs, 5/8-inch gypsum wallboard with joints taped on occupied side, and ½-inch fire-retardant plywood on construction side.
2. Construct dustproof, floor-to-ceiling partitions of not less than nominal 4-inch studs, 2 layers of 3-mil polyethylene sheets, inside and outside temporary enclosure. Cover floor with 2 layers of 3-mil (polyethylene sheets, extending sheets 18 inches up the sidewalls. Overlap and tape full length of joints. Cover floor with 314-inch fire-retardant plywood.

    a. Construct a vestibule and airlock at each entrance to temporary enclosure with not less than 48 inches between doors. Maintain water-dampened foot mats in vestibule.
3. Insulate partitions to provide noise protection to occupied areas.
4. Seal joints and perimeter. Equip partitions with dustproof doors and security locks.
5. Protect air-handling equipment.
6. Weather-strip openings.

J. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

1. Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with sign mounted above.

    a. Locate fire extinguishers where convenient and effective for their intended purpose; provide not less than one extinguisher on each floor at or near each usable stairwell.

2. Store combustible materials in containers in fire-safe locations.
3. Mainline unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire-exposure areas.
4. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
5. Develop and supervise an overall fire-prevention and first-aid fire-protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
6. Provide hoses for fire protection of sufficient length to reach construction areas. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.
7. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
2. Maintain markers for underground lines. Protect from damage during excavation operations.

C. Temporary Facility Changeover: Except for using permanent fire protection as soon as available, do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the property of Contractor. Owner reserves right to take possession of Project identification signs.

2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements in Division 1 Section "Closeout Procedures."

END OF SECTION

SECTION 01600 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for selecting products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.

B. See Division 1 Section "Closeout Procedures" for submitting warranties for contract closeout.

C. See Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.2 DEFINITIONS

A. Products; Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products; Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

E. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

1.3 SUBMITTALS

A. Product List: Submit a list, in tabular from, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.

1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
2. Completed List: Within 30 days after date of commencement of the Work, submit 3 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
3. Landscape Architect's Action: Landscape Architect will respond in writing to Contractor within 7 days of receipt of completed product list. Landscape Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Landscape Architect's response, or lack of response, does not constitute a waiver of requirement that products comply with the Contract Documents.

B. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use CSI Form 13.1A
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

    a. Statement indicating why specified material or product cannot be provided.
    b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, which will be necessary to accommodate proposed substitution.
    c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
    d. Product Data, including Drawings and descriptions of products and fabrication and installation procedures.
    e. Samples, where applicable or requested.
    f. List of similar installations for completed projects with project names and addresses and names and addresses of Landscape Architects and owners.
    g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
    h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
    i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time.
    j. Cost information, including a proposal of change, if any, in the Contract Sum.
    k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
    l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Landscape Architect's Action: If necessary, Landscape Architect will request additional information or documentation for evaluation within one week of receipt of a request for substitution. Landscape Architect will notify Contractor of acceptance or rejection of proposed substitution within 5 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
    a. Form of Acceptance: Change Order.

b. Use product specified if Landscape Architect cannot make a decision on use of a proposed substitution within time allocated.
c. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section "Submittal Procedures." Show compliance with requirements.

1.4 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
5. Store products to allow for inspection and measurement of quantity or counting of units.
6. Store materials in a manner that will not endanger Project structure.
7. Store products that are subject to damage by the elements, under cover in a weather tight enclosure above ground, with ventilation adequate to prevent condensation.
8. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
9. Protect stored products from damage.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: Forms are included with the Specifications. Prepare a written document using appropriate form properly executed.
3. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT OPTIONS

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Landscape Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Landscape Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.

B. Product Selection Procedures: Procedures for product selection include the following:

1. Product: Where Specification paragraphs or subparagraphs titled "Product" name a single product and manufacturer, provide the product named.

    a. Substitutions may be considered, unless otherwise indicated.

2. Manufacturer/Source: Where Specification paragraphs or subparagraphs titled "Manufacturer" or "Source" name single manufacturers or sources, provide a product by the manufacturer or from the source named that complies with requirements.

    a. Substitutions may be considered, unless otherwise indicated.

3. Products: Where Specification paragraphs or subparagraphs titled "Products" introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.

    a. Substitutions may be considered, unless otherwise indicated.

4. Manufacturers: Where Specification paragraphs or subparagraphs titled "Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.

    a. Substitutions may be considered, unless otherwise indicated.

5. Available Products: Where Specification paragraphs or subparagraphs titled "Available Products" introduce a list of names of both products and manufacturers, provide one of the products listed or another product that complies with requirements. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.

6. Available Manufacturers: Where Specification paragraphs or subparagraphs titled "Available Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed or another manufacturer that complies with

requirements. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.

7. Basis-of-Design Products: Where Specification paragraphs or subparagraphs titled "Basis-of-Design Product" are included and also introduce or refer to a list of manufacturers' names, provide either the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.

    a. Substitutions may be considered, unless otherwise indicated.

8. Visual Matching Specification: Where Specifications require matching an established Sample, select a product (and manufacturer) that complies with requirements and matches Landscape Architect's sample. Landscape Architect's decision will be final on whether a proposed product matches satisfactorily.

9. If no product available within specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents on "substitutions" for selection of a matching product. g. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product (and manufacturer) that complies with other specified requirements.

    a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Landscape Architect will select color, pattern, or texture from manufacturer's product line that does not include premium items.
    b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Landscape Architect will select color, pattern, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRODUCT SUBSTITUTIONS

A. Timing: Landscape Architect will consider requests for substitution if received within 14 days prior to bid opening. Requests received after that time may be considered or rejected at discretion of Landscape Architect.

B. Conditions: Landscape Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Landscape Architect will return requests without action, except to record noncompliance with these requirements:

    1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Landscape Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
    2. Requested substitution does not require extensive revisions to the Contract Documents.
    3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    4. Substitution request is fully documented and properly submitted.
    5. Requested substitution will not adversely affect Contractor's Construction Schedule.

6. Requested substitution has received necessary approvals of authorities having jurisdiction.
7. Requested substitution is compatible with other portions of the Work.
8. Requested substitution has been coordinated with other portions of the Work.
9. Requested substitution provides specified warranty.

2.3 COMPARABLE PRODUCTS

A. Where products or manufacturers are specified by name, submit the following, in addition to other required submittals, to obtain approval of an unnamed product:

1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of Landscape Architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION

Advancement of Construction Technology

SUBSTITUTION REQUEST
(After the Bidding Phase)

Project: _____ Substitution Request Number: .

_____ From: _____

To: _____ Date: _____

_____ A/E Project Number: _____

Re: _____ Contract For: _____

Specification Title: _____ Description: Copy section title from specification

Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No.: _____

Installer: _____ Address: _____ Phone: _____

History: ☐ New product ☐ 2-5 years old X☐ 5-10 years old ☐ More than 10 years old

Differences between proposed substitution and specified product: _____

_____

_____

X☐ Point-by-point comparative data attached - REQUIRED BY A/E

Reason for not providing specified item: _____

_____

Similar Installation:

Project: _____ Architect: _____

Address: _____ Owner: _____

_____ Date Installed: _____

Proposed substitution affects other parts of Work: X ☐ No ☐ Yes; explain _____

_____

Savings to Owner for accepting substitution: _____ ($ _____).

Proposed substitution changes Contract Time: ☐ No ☐ Yes [Add] [Deduct] _____ days.

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

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SUBSTITUTION REQUEST
(Continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

_____

Telephone: _____

Attachments: _____

_____

_____

_____

A/E's REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Specification Section 01330.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: Date:

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☐ A/E ☐ _____

_____

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SECTION 01700 - EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. General installation of products.
4. Progress cleaning.
5. Starting and adjusting.
6. Protection of installed construction.
7. Correction of the Work.

B. See Division 1 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.2 SUBMITTALS

A. Certificates: Submit certificate signed by land surveyor or professional engineer certifying that location and elevation of improvements comply with requirements.

B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

C. Certified Surveys: Submit two copies signed by land surveyor or professional engineer.

D. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

1.3 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

1. Before construction, verify the location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities and other construction affecting the Work.

1. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
3. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Landscape Architect and Owner not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Owner's written permission.

C. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

D. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

E. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Landscape Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Submit requests on CSI Form 13.2A, "Request for Interpretation."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to layout the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Landscape Architect promptly.

B. General: Engage a land surveyor or professional engineer to layout the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines of construction and elsewhere as needed to locate each element of Project.
2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
3. Inform installers of lines and levels to which they must comply.
4. Check the location, level and plumb, of every major element as the Work progresses.
5. Notify Landscape Architect when deviations from required lines and levels exceed allowable tolerances.
6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and layout site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.

D. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Landscape Architect.

3.4 FIELD ENGINEERING

A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

B. Benchmarks: Establish and maintain a minimum of two benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Landscape Architect.

F. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

G. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

G. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

H. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

I. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.8 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.9 CORRECTION OF THE WORK

A Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section "Cutting and Patching."

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

SECTION 01731 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

B. See Divisions 2 through 16 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

C. Requirements in this Section apply to mechanical and electrical installations. See Divisions 15 and 16 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.2 SUBMITTALS

A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:

1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
2. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
3. Products: List products to be used and firms or entities that will perform the Work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List the utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
7. Landscape Architect's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.3 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that result in increased maintenance or decreased operational life or safety.

C. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity, which results in reducing their capacity to perform as intended, or that result in increased maintenance or decreased operational life or safety.

D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Landscape Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

    1. If possible, retain original Installer or fabricator to cut and patch exposed Work listed below. If it is impossible to engage original Installer or fabricator, engage another recognized, experienced, and specialized firm.

1.4 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections of these Specifications.

B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

    1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

    1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
    2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
D. Existing Services: Where existing services are required to be removed, relocated, or abandoned; bypass such services before cutting to minimize interruption of services to occupied areas.

3.3 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

    1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

    1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
    2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
    3. Concrete or masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
    4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
    5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
    6. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.

    1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
    2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

END OF SECTION

SECTION 01770 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Project Record Documents.
3. Operation and maintenance manuals.
4. Warranties.
5. Instruction of Owner's personnel.
6. Final cleaning.

B. See Division 1 Section "Payment Procedures" and Owner-Contractor Agreement for requirements for Applications for Payment for Substantial and Final Completion.

C. See Division 1 Section "Construction Progress Documentation" for submitting Final Completion construction photographs and negatives.

D. See Divisions 2 through 16 Sections for specific closeout and special cleaning requirements for products of those Sections.

1.2 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs and photographic negatives, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Landscape Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Landscape Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Landscape Architect, that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.3 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
2. Submit certified copy of Landscape Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Landscape Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Landscape Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Landscape Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order.
2. Organize items applying to each space by major element.

1.5 PROJECT RECORD DOCUMENTS

A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Landscape Architect's reference during normal working hours.

B. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.

1. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
3. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
4. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.

C. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Note related Change Orders and Record Drawings, where applicable.

D. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1.6 OPERATION AND MAINTENANCE MANUALS

A. Assemble a complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:

1. Operation Data: Include emergency instructions and procedures, system and equipment descriptions, operating procedures, and sequence of operations.
2. Maintenance Data: Include manufacturer's information, list of spare parts, maintenance procedures, maintenance and service schedules for preventive and routine maintenance, and copies of warranties and bonds.

B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.

1.7 WARRANTIES

A Submittal Time: Submit written warranties for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11inch paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 DEMONSTRATION AND TRAINING

A. Instruction: Instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Provide instructors experienced in operation and maintenance procedures.
2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
3. Schedule training with Owner, through Landscape Architect, with at least seven days' advance notice.
4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.

B. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections. For each training module, develop a learning objective and teaching outline.

1. Include instruction for system design and operational philosophy, review of documentation, operations, adjustments, troubleshooting, maintenance, and repair.

3.2 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Clean exposed exterior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
f. Remove debris and surface dust from limited access spaces, trenches, equipment vaults, manholes, and similar spaces.
g. Remove labels that are not permanent.
h. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

i. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
j. Replace parts subject to unusual operating conditions.
k. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
l. Leave Project clean and ready for occupancy.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.

D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION

SECTION 02010 - SUBSURFACE EXPLORATION

Contract drawings, Division 0, Conditions of the Contract, and Division1, General Requirements, apply to the Work of this Section

PART 1 - GENERAL

1.01 SUMMARY

A. A soils investigation report has been prepared for the site of this Work.

B. Availability: The soils investigation report may be inspected at the office of the Landscape Architect, and copies may be obtained from the Soils Engineer at the cost of reproduction and handling upon request accompanied by full payment.

C. Use of Data: This report was provided only for the Architect's use in design and is not a part of the Contract Documents. The report is available for information, but is not a warranty of subsurface conditions.

1.02 QUALITY ASSURANCE

A. Soils Engineer will be retained by the Owner to observe performance of work in connection with work included in this Contract.

B. Adjustment of Work: Readjust all work performed that does not meet technical or design requirements, but make no deviations from the Contract Documents without specific written approval from the Architect.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 02200 – SITE PREPARATION AND EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Division 1 apply to this Section. Provide and perform site preparation and earthwork, complete site clearing, excavation, filling, backfilling, and compaction, over excavation and placement of engineered fill below floor slabs and footings, imported fill material as required, subgrade preparation for on-grade concrete, gravel fill under floor slabs, rough grading in asphaltic concrete paving areas, control of surface and ground water, testing and inspection of work of this section, clean up and disposal.

1.2 QUALITY ASSURANCE

A. Professional Observation: Required for all work of this Section. The Soils Engineer shall have the following duties:
   1. Observe the stripping and clearing of vegetation and deleterious materials.
   2. Observe the over excavation to determine that the depth of excavation and bottom of the subgrade are suitable.
   3. Observe the exposed subgrade in areas to receive fill and in areas where excavation has resulted in the desired finished subgrade, observe proof rolling, and delineate areas requiring additional excavation.
   4. Observe the compaction of scarified soils.
   5. Perform visual observation to evaluate the suitability of on-site and imported soils for fill placement; collect and submit soil samples for laboratory testing.
   6. Perform field density and compaction testing to determine the percentage of compaction achieved during placement of fills.
   7. Observe and probe foundation bearing materials to confirm that suitable bearing materials are present at the design grades.
   8. Observe the backfill of utility trenches.
   9. Observe the construction of the subgrade and base for exterior paving.

B. Preconstruction Conference: Contractor shall conduct a preconstruction conference prior to starting work of this section, to develop a program for quality control of the work. The requirements for observation of the work by the Soils Engineer, scheduling of the work to be observed, any additional observation requirements, and planned construction procedures, will be discussed. Minutes of the conference shall be kept, and copies distributed, with an additional copy to the Soils Engineer.

C. Source Quality Control: Obtain approval by the Soils Engineer of imported fill material before material is brought to site, and same approval of excavated material for use in fills or backfills prior to placing. Imported material shall be tested for toxic substances by an independent testing laboratory approved by the University.

1.3 SUBMITTALS

A. Provide certification, signed by an authorized representative of an approved testing laboratory, that proposed imported fill material and other earthwork materials to be brought to the site, are free from toxic substances, and are in conformance with applicable state and local regulations.

1.4 PROJECT SITE CONDITIONS

A. Protection: Provide and maintain protection to retain earth banks and to protect adjoining grades and structures from caving, sliding, erosion, or other damage. Provide suitable protection against all bodily injury. Construct all bulkheads and shoring to requirements of State and Local codes and regulations. Shore vertical banks or slope banks back as required for stability and safety. Erect temporary barricades located at least 5-feet away from the top of slopes, and provide temporary berms as required to prevent slope erosion from water.

B. Digital Photographs and Videos: Required prior to starting work of this Section.

C. Utilities: Perform work adjacent to public utilities in accordance with procedures outlined by the utility company. For work adjacent to the Owner's utility lines, excavate by hand until the utility is uncovered or sufficient clearance is defined for machine work.

D. Drainage: Collect and dispose of surface and subsurface water encountered in the course of construction.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Provide approved imported material as required if the quantity of approved site and excavated material is insufficient to complete the work.

B. Earthwork Materials: Approved excavated or imported granular soil such as silty sand having an expansion index of 20 or less, and containing not more than 20 percent by weight of material passing the No. 200 sieve, free from trash, roots, organic material, clay lumps, and rocks over 6" size.

C. Gravel Fill Material: From approved source, 90 percent to 100 percent passing a 3/4" sieve, 0 percent to 10 percent passing a No. 4 sieve, and 0 percent to 3 percent passing a No. 100 sieve.

D. Sand: ASTM D2488, with not more than 3 percent passing No. 200 sieve.

PART 3 - EXECUTION

3.1 COMPACTION CONTROL

A. Unless otherwise specified hereafter, compaction densities shall be not less than the following. Moisten or aerate material to specified moisture content, then uniformly compact the fills and backfills in maximum 8" thick loose layers to 90 percent of the maximum dry density determined by ASTM D1557. This is the minimum compaction; average shall be at least 92 percent. Flooding or jetting is not allowed. In areas to be landscaped only, fills may be placed in 12" layers and compacted to 85 percent of maximum dry density.

3.2 MOISTURE CONTENT CONTROL

A. Material to be compacted shall be brought to uniform moisture content varying no more than zero percent below or 3 percent above optimum moisture content. Obtain approval by the Soils Engineer of the

moisture content before performing further grading operations. Mix, dampen, or dry soils as required to achieve specified moisture content.

3.3 SITE CLEARING

A. Coordinate with the Demolition Contractor for the demolition and removal of the existing piles and pile caps, grade beams and asphalt paving and base course from areas to receive the new building as shown on the drawings as indicated. Asphalt paving may be pulverized and blended with site soils to be used for engineered fill material, provided the specified results of compaction and grading are obtained.

3.4 REMOVAL AND REPLACEMENT OF UNSUITABLE SOILS

A. General: As indicated in the soils report, unsuitable soils conditions may be encountered in the area of the building to depth of approximately 6'-0". If any of the following conditions occur, the provisions of this paragraph shall apply.
   1. Dissimilar native materials are encountered across the building footprint.
   2. Incompetent zones are encountered.
   3. The subgrade becomes disturbed during construction.
   4. Creation of a level pad requires a cut/fill transition within the building pad.
   5. The Soils Engineer determines that field conditions require procedures specified herein.

B. In the event that any of the above conditions occur, the following procedures shall be performed.
   1. After removal of existing paving, remove all uncontrolled fill soils, all upper loose, firm, porous or disturbed natural soils from areas to receive footings, slabs, walks and paving to a distance of 5 feet beyond edges of same.
   2. Soils shall be removed to a depth that will provide not less than 2 feet of compacted soil below building slabs and 5 feet beyond, and 18 inches below exterior paving, walks, and new asphalt paving
   3. After excavating, the exposed soils shall be inspected to verify removal of all unsuitable deposits. Remove all rocks larger than 8" in largest dimension.
   4. The exposed soils shall be scarified to a depth of 6", moisture added as required and recompacted to not less than 90 percent of the maximum dry density at optimum moisture content in accordance with ASTM D1557. Fill shall be placed in loose lifts not exceeding 8" in thickness and compacted to 90 percent as defined above. Compaction shall be accomplished continuously over the entire area. Sufficient passes shall be made to ensure that specified density is obtained.

3.5 EXCAVATION AND BACKFILLING FOR FOUNDATIONS AND STRUCTURES:

A. Foundation Soils: Excavate for foundations to sizes indicated, clean, and leave in condition recommended by Geotechnical Investigation Report. Prior to placement of forms, reinforcing, or concrete, obtain approval of Soils Engineer and building department as required, for proper conditions and suitable bearing materials.

B. Perform excavation to the dimensions and elevations indicated on drawings, with additional space allowed as required for the installation and stripping of forms, and inspection of the various types of work, except where approval may be given to deposit certain miscellaneous concrete directly against earth banks.

C. Provide lateral support for excavations within and adjacent to structures, foundations and slabs-on-grade to prevent caving, earth movement or loosening of subgrade materials.

D. Adverse Subsurface Conditions: Notify Project Engineer should unsuitable bearing soil or other adverse subsurface conditions be found which are not indicated by the drawings or specifications.

E. Unauthorized Excavation: If excavations are carried below the elevations indicated without written authorization, provide satisfactory construction to correct the fault as approved, at no additional contract cost.

F. Backfill Beside Foundations:
1. Backfilling against concrete shall not be done until concrete has attained its 28-day compressive strength, unless specifically approved otherwise.
2. Moisten or aerate backfill material as required to attain specified moisture content. Place backfill material adjacent to structures and compact in a manner that prevents wedging action or eccentric loading upon or against the structures. Step or serrate slopes bounding or within areas to be backfilled to prevent sliding of the fill. Do not place material on surfaces that are muddy. Do not use equipment for backfilling operations or for the formation of embankments against structures that will overload the structure.

3.6 EXCAVATION AND BACKFILLING FOR UTILITIES

A. Trenching and excavating for underground piping, conduits, and related items are performed under other sections. Conform trenching operations to the following requirements:
1. Trenches: Excavate trenches to widths required for proper laying of pipe, with banks as nearly vertical as practicable. Bring bottoms of trenches to the required depths, all accurately graded to provide uniform bearing on undisturbed soil for entire length of each section of pipe, except where it is necessary to excavate for pipe bells or for pipe bedding specified in other sections.
2. Methods: Machine excavation method may be used down to rough elevations. Perform fine grading and trimming by hand method.
3. Trench Backfilling: Conform to Paragraph "Compaction" except compact all backfill to at least 95 percent of maximum dry density where the trenches are located in paved areas or under building or structures. Take precautions in placing and compaction of backfill to avoid damaging pipes, ducts, conduits, and structures. The upper 12 inches of trench backfill materials shall consist of on-site soil material, compacted as specified.

3.7 SUBGRADE PREPARATION FOR CONCRETE

A. Prepare subgrade for concrete items placed directly on earth by excavating, filling, and grading as required and as specified, and bring to optimum moisture content. Excavate the existing subgrade to a depth of 12 inches, moisture condition, and recompact to 90 percent. Finish the subgrade within 0.10-foot tolerance when tested along a 10-foot straightedge in any direction at any location. Compact to density specified for fills, and maintain moisture content until concrete is placed.

3.8 ASPHALTIC CONCRETE PAVING AREAS

A. Bring areas to required elevations and grades by clearing and preparation, cutting, filling, and grading, as shown and specified herein. Allow for thickness of subsequent materials. Excavate the existing subgrade to a depth of 12 inches, moisture condition, and recompact to 90 percent. Final fine grading and compaction is specified as a part of the paving operations. Coordinate with Section 02510 requirements.

3.9 LANDSCAPE AREAS

A. Bring to nominal 0.10-foot below required grades except where topsoil fill occurs, and finish with smoothly curving contours at grade changes and slopes, as approved. Grade to allow for thickness of topsoil fill. Avoid excessive compaction in all areas.

3.10 GRADING

A. After completion of construction, and immediately prior to final acceptance, all surfaces not covered by landscaping, paving, or other materials shall be raked clean and uniformly graded to elevations shown on drawings, with smoothly curving contours.

3.11 DISPOSAL

A. Clean up and remove all trash, debris, waste, and surplus and rejected earthwork materials from the site to a legal disposal area. Conform to pertaining laws, codes, and regulations, obtain and pay for required hauling and dumping permits, and pay all dumping charges. Perform trucking and material handling in a careful manner to prevent spillage and dusting or damage to surfaces and structures. Remove planks used to protect surfaces subject to public traffic at finish of each day's operations. Maintain public streets and sidewalks in broom clean condition.

3.12 PROTECTION

A. Protect newly graded areas from traffic, erosion, and settlement. Repair and reestablish damaged or eroded slopes, elevations, or grades and restore surface construction prior to acceptance.

3.13 FIELD QUALITY CONTROL:

A. Refer to Division 1 for additional requirements, specifically Section 01400.

B. Testing: Testing Laboratory will take test samples and perform materials, moisture content, compaction densities, and other tests to the extent and by the methods directed by the Soils Engineer.

C. Professional Certificates: Upon completion, Soils Engineer will furnish written certificates that earthwork and compaction densities conform to requirements herein.

END OF SECTION 02200

SECTION 02230 - SITE CLEARING

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. Section Includes:

1. Removing existing vegetation.
2. Clearing and grubbing.
3. Stripping and stockpiling topsoil.
4. Temporary erosion- and sedimentation-control measures.

B. Related Sections:
1. Division 1 Section "Mobilization and Temporary Controls" for temporary utility services, construction and support facilities, security and protection facilities, and temporary erosion- and sedimentation-control measures.
2. Division 1 Section "Field Engineering" for field engineering and surveying.

1.3 DEFINITIONS

A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.

D. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.

E. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated.

F. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 MATERIAL OWNERSHIP

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

1.5 SUBMITTALS

A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.

1. Use sufficiently detailed photographs or videotape.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

1.6 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, 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 Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Architect.

C. Utility Locator Service: Notify utility locator service, Underground Service Alert (DigAlert) or other approved service, for area where Project is located before site clearing.

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

E. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

F. Do not direct vehicle or equipment exhaust towards protection zones.

G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

H. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

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

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

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

B. 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 and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.

B. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

C. After completion of construction, remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
2. Grind down stumps and remove roots, obstructions, and debris to a depth of 18 inches (450 mm) below exposed subgrade.
3. Use only hand methods for grubbing within protection zones.
4. Chip removed tree branches and stockpile in areas approved by Architect.

B. 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 (200 mm), and compact each layer to a density equal to adjacent original ground.

3.4 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to depth of 6 inches (150 mm) in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

1. Limit height of topsoil stockpiles to 72 inches (1800 mm).
2. Do not stockpile topsoil within protection zones.
3. Stockpile surplus topsoil to allow for respreading deeper topsoil.

3.5 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.

3.6 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION 02230

SECTION 02300 - EARTHWORK

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. Section Includes:

1. Preparing subgrades for slabs-on-grade.
2. Excavating and backfilling for buildings and structures.
3. Drainage course for concrete slabs-on-grade.
4. Subbase course for concrete slabs.
5. Subbase course and base course for asphalt paving.
6. Subsurface drainage backfill for walls and trenches.
7. Excavating and backfilling trenches for utilities and pits for buried utility structures.
8. Excavating well hole to accommodate elevator-cylinder assembly.

B. Related Sections:

1. Division 1 Section "Construction Progress Documentation " for recording pre-excavation and earth moving progress.
2. Division 1 Section "Temporary Facilities and Controls" for temporary controls, utilities, and support facilities; also for temporary site fencing if not in another Section.
3. Division 2 Section "Site Clearing" for site stripping, grubbing, stripping topsoil, and removal of above- and below-grade improvements and utilities.
4. Division 2 Section "Dewatering" for lowering and disposing of ground water during construction.
5. Division 2 Section "Excavation Support and Protection" for shoring, bracing, and sheet piling of excavations.
6. Division 2 Section "Drilled Piers" for excavation of shafts and disposal of surplus excavated material.
7. Division 2 Section "Subdrainage" for drainage of landscaped areas.
8. Division 2 Section "Lawns and Grasses" for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.
9. Division 2 Section "Exterior Plants" for finish grading in planting areas and tree and shrub pit excavation and planting.
10. Division 3 Section "Cast-in-Place Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.
11. Divisions 2, 15, and 16 Sections for installing underground mechanical and electrical utilities and buried mechanical and electrical structures.
12. Division 14 Section Hydraulic Freight Elevators for excavating well hole to accommodate elevator-cylinder assembly.

1.3 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

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

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade 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. Bulk Excavation: Excavation more than 10 feet (3 m) in width and more than 30 feet (9 m) in length.
3. 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.

G. Fill: Soil materials used to raise existing grades.

H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

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

1.4 SUBMITTALS

A. Product Data: For each type of the following manufactured products required:

1. Warning tapes.

B. Samples for Verification: For the following products, in sizes indicated below:

1. Warning Tape: 12 inches (300 mm) long; of each color.

C. Material Test Reports: For each on-site soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to ASTM D 1557.

D. Seismic survey report from seismic survey agency.

E. Pre-excavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

1.5 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

B. Seismic Survey Agency: An independent testing agency, acceptable to authorities having jurisdiction, experienced in seismic surveys and blasting procedures to perform the following services:
1. Report types of explosive and sizes of charge to be used in each area of rock removal, types of blasting mats, sequence of blasting operations, and procedures that will prevent damage to site improvements and structures on Project site and adjacent properties.
2. Seismographic monitoring during blasting operations.

1.6 PROJECT CONDITIONS

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

1. Do not close or obstruct streets, walks, 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 Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Architect.

C. Utility Locator Service: Notify utility locator service, Underground Service Alert (DigAlert) or other approved service, for area where Project is located before beginning earth moving operations.

D. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures, specified in Division 1-"Temporary Facilities and Division 2 - "Site Clearing," are in place.

E. Do not commence earth moving operations until plant-protection measures specified in Division 2 Section "Tree Protection and Trimming" are in place.

F. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.

4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

G. Do not direct vehicle or equipment exhaust towards protection zones.

H. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487 , or a combination of these groups; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

1. Liquid Limit: As specified in the Soils Report.
2. Plasticity Index: As specified in the Soils Report.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487 , or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Subbase Material: 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 (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.

E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

F. 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 (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.

G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.

I. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch (25-mm) sieve and 0 to 5 percent passing a No. 4 (4.75-mm) sieve.

J. Sand: ASTM C 33; fine aggregate.

K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

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

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade 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.

3.4 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Pile Foundations: Stop excavations 6 to 12 inches (150 to 300 mm) above bottom of pile cap before piles are placed. After piles have been poured, , remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.
3. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch (25 mm). Do not disturb bottom of excavations intended as bearing surfaces.

B. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Cut and protect roots according to requirements in Division 2 Section "Tree Protection and Trimming."

3.5 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.6 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: 12 inches (300 mm) each side of pipe or conduit

C. Trench Bottoms: Excavate trenches 4 inches (100 mm) deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

1. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
3. Cut and protect roots according to requirements in Division 2 Section "Tree Protection and Trimming."

3.7 EXCAVATION FOR ELEVATOR CYLINDER

A. Drill well hole plumb in elevator pit to accommodate installation of elevator-cylinder assembly. Coordinate with applicable requirements for diameter and tolerances in Division 14 Section "Hydraulic Freight Elevators."

B. Provide well casing as necessary to retain walls of well hole.

3.8 SUBGRADE INSPECTION

A. Notify IOR and Soils Engineer when excavations have reached required subgrade.

B. If IOR and Soils Engineer determine that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Soils Engineer, without additional compensation.

3.9 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi (17.2 MPa), may be used when approved by Architect.

1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

3.10 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.

3.11 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.

6. Removing temporary shoring and bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.12 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Division 3 Section "Cast-in-Place Concrete ."

D. Trenches under Roadways: Provide 4-inch- (100-mm-)thick, concrete-base slab support for piping or conduit less than 30 inches (750 mm) below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches (100 mm)of concrete before backfilling or placing roadway subbase course. Concrete is specified in Division 3 Cast-in-Place Concrete

E. Backfill voids with satisfactory soil while removing shoring and bracing.

F. Place and compact final backfill of satisfactory soil to final subgrade elevation.

3.13 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 grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.
3. Under steps and ramps, use engineered fill.
4. Under building slabs, use engineered fill.
5. Under footings and foundations, use engineered fill.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.14 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade 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.

3.15 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) 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, building slabs, steps, and pavements, scarify and recompact top 24 inches (300 mm) of existing subgrade and each layer of backfill or fill soil material at 90 percent.
2. Under walkways, scarify and recompact top 24 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 90 percent.
3. Under turf or unpaved areas, scarify and recompact top 24 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 90 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at 90 percent.
5. For flexible asphalt concrete pavement for parking, compact aggregate base and asphalt concrete at 95 percent.

3.16 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.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch (25 mm)
2. Walks: Plus or minus 1 inch (25 mm)
3. Pavements: Plus or minus 1/2 inch (13 mm)

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch (13 mm) when tested with a 10-foot (3-m) straightedge.

3.17 SUBSURFACE DRAINAGE

A. Subdrainage Pipe: Specified in Division 2 Section "Subdrainage."

B. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches (300 mm) of final subgrade, in compacted layers 6 inches (150 mm) thick. Overlay drainage backfill with one layer of subsurface drainage geotextile, overlapping sides and ends at least 6 inches (150 mm).

1. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D 698.

2. Place and compact impervious fill over drainage backfill in 6-inch- (150-mm-) thick compacted layers to final subgrade.

3.18 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:

1. Place base course material over subbase course under hot-mix asphalt pavement.
2. Shape subbase course and base course to required crown elevations and cross-slope grades.
3. Place subbase course and base course 6 inches (150 mm) or less in compacted thickness in a single layer.
4. Place subbase course and base course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
5. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 90 percent- of maximum dry unit weight according to ASTM D 1557. For flexible asphalt concrete pavement for parking, compact aggregate base and asphalt concrete at 95 percent.

C. Pavement Shoulders: Place shoulders along edges of subbase course and base course to prevent lateral movement. Construct shoulders, at least 12 inches (300 mm) wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.19 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

A. Place drainage course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:

1. Place drainage course 6 inches (150 mm) or less in compacted thickness in a single layer.
2. Place drainage course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
3. Compact each layer of drainage course to required cross sections and thicknesses to not less than 90 percent of maximum dry unit weight according to ASTM D 1557.

3.20 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
2. Determine that fill material and maximum lift thickness comply with requirements.

3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.

B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.

E. 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. Tests will be performed at the following locations and frequencies:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. (186 sq. m) or less of paved area or building slab, but in no case fewer than three tests.
2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 75 feet (30 m) or less of wall length, but no fewer than two tests.
3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet (46 m) or less of trench length, but no fewer than two tests.

F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.21 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.

1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

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

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.22 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 02300

SECTION 02630 STORM DRAINAGE

PART 1 - DESCRIPTION

1.01 SCOPE

A. The Contractor shall provide all labor and equipment necessary and required to install all of the storm drainage facilities in accordance with the Contract Documents. Work shall include, but not be limited to:

1. Installation of drainage system(s) consisting of manholes, drain inlets, catch basins, pipe, end sections, outlet control structure(s), and all necessary and required accessory items and operations, including connection(s) to existing drainage facilities.

2. Installation of building leader drains at building downspouts, where indicated on plans or as described herein, consisting of all pipe, fittings and required accessory items and operations, including connections to the proposed and/or existing drainage system. All downspouts at the front of building within 5'-0" of a sidewalk shall have leader drain connection to the storm piping.

3. Where shown, installation of underdrains consisting of all pipe, fittings and required accessory items and operations, including connections to the proposed and/or existing drainage system.

1.02 WORK SPECIFIED UNDER OTHER SECTIONS

A. The following related work is specified under other Sections:
1. Division 2: Excavation Support and Protection
2. Division 2: Earthwork
3. Division 2: Cement Concrete Pavement
4. Division 2: Asphalt Concrete Paving

1.03 OTHER REQUIREMENTS

A. In addition to the requirements specified herein, the Contractor shall comply with the requirements as specified on the Drawings.

PART 2 - CONSTRUCTION DETAILS

2.01 GENERAL

A. The Contractor shall install all drainage structures and pipe in the locations shown on the Drawings. Pipe shall be of the type and sizes specified and shall be laid accurately to line and grade. Structures shall be accurately located and properly oriented.

B. The installation of all drainage structures and pipe shall conform to the requirements of all Authorities having jurisdiction.

2.02 TRENCH EXCAVATION AND BACKFILL

A. The provisions of the Article of these Specifications entitled "Earthwork" shall govern all work under this Section.

2.03 STORAGE AND HANDLING

A. Storage - Storage of storm drain pipe and appurtenances on the job shall be in accordance with the manufacturers' recommendations.

B. Handling - All storm drain pipe and appurtenances shall be protected against impact, shock and free fall, and only equipment of sufficient capacity and proper design shall be used in handling the pipe and appurtenances.

2.04 DAMAGE

A. General - Pipe and/or appurtenances which are defective from any cause, including damage caused by handling, shall be unacceptable for installation and shall be replaced by the Contractor at no cost to the Owner.

Pipe and/or appurtenances that are damaged or disturbed through any cause prior to acceptance of the Work, shall be repaired, realigned or replaced by the Contractor at the Contractor's expense.

B. Minor Imperfections in Concrete Pipe - Concrete pipe with damage which is the result of minor imperfections in manufacture which do not affect the structural integrity of the pipe may be repaired in the field. Repairs shall be sound, properly finished and cured and shall conform to the requirements of these Specifications.

2.05 PIPE INSTALLATION

A. Laying Pipe - Each length of pipe shall be laid with firm, full and even bearing throughout its entire length, in a trench prepared and maintained in accordance with the details as shown on the Drawings and the Article of these Specifications entitled "Trench Excavation and Backfill". Pipe shall be laid upgrade unless otherwise directed by the Owner's Field Representative.

Concrete pipe with lift holes shall be laid with the lift holes on top of the pipe. After the pipe is installed, the lift holes shall be sealed with suitable concrete plugs to the satisfaction of the Owner's Field Representative. No lift holes will be permitted in pipes twenty-four (24) inches in diameter or smaller.

Bell and spigot pipe shall be laid with the bell end upgrade; tongue and groove pipe shall be laid with the groove end upgrade. Trimming of the pipe will not be allowed.

Every length of pipe shall be inspected and cleaned of all dirt and debris before being laid. Prior to the placing of a length of pipe, the end of the previously laid length shall be carefully and thoroughly wiped smooth and cleaned to obtain an even and close-fitting joint.

No length of pipe shall be laid until the proceeding lengths of pipe have been thoroughly embedded in place, so as to prevent movement or disturbance of the pipe.

B. Pipe Extensions - Where existing pipe is to be extended, the same type of pipe shall be used unless otherwise specified.

C. Full Lengths of Pipe - Only full lengths of pipe are to be used in the installation except that partial lengths of pipe may be used at the entrance to structures where necessary to obtain a proper connection to the structure.

D. Pipe Entrances to Structures - All pipe entering structures (e.g. manholes, drain inlets, catch basins, etc.) shall be cut flush with the inside face of the structure, and the cut ends of the pipe and surface of the structure shall be properly rounded and finished so that there will be no protrusion, ragged edges, or imperfections that will impede the flow of water or affect the hydraulic characteristics of the installation.

Only full sections of pipe shall be used where entering a structure which will be exposed to view, such as headwalls, end sections, etc.

E. Bedding and Backfilling - The type of materials to be used as bedding and backfill and the method of placement shall conform to the requirements of the Article of these Specifications entitled "Trench Excavation and Backfill" and as shown on the details of the Drawings.

F. Protection During Construction - The Contractor shall protect the installation at all times during construction. Movement of construction equipment, vehicles and loads over and adjacent to any pipe shall be done at the Contractor's risk.

At all times when pipe laying is not in progress, all open ends of all pipes shall be closed by approved temporary watertight plugs. If water is in the trench when work is resumed, the plugs shall not be removed until the trench has been pumped dry and all danger of water entering the pipe has been eliminated.

The Contractor shall furnish a sufficient pumping plan and shall provide and maintain at his own expense satisfactory drainage wherever needed in the trench and other excavations during the progress of the Work and at its completion for final inspection. No pipe or other structure shall be laid in water and water shall not be allowed to flow or rise under any concrete or other masonry. All water pumped or bailed from the trench or other excavation shall be conveyed in proper manner to a suitable point of discharge. The flow in all sewers, drains and watercourses encountered on the Work and in gutters along the sides of or across the Work shall be entirely provided for, both temporarily and permanently, as required, by the Contractor at his expense. All offensive water shall be removed from the Work at once.

G. Tolerance - Pipe shall be laid accurately to the line and grade shown on the Drawings. Allowable tolerances shall be one-half (1/2) inch on grade and one (1) inch on line in any section of pipe between structures. No adverse grades shall be allowed. Deviations from these tolerances shall be a basis for rejection of the line of pipe. Any line which has been rejected shall be rebuilt to the correct line and grade by the Contractor at his own expense.

H. Perforated Foundation Drain Piping – shall receive one blanket of Typar filter fabric, 30" wide coved over top of pipe and backfilled with 18" nominal #57 stone prior to general soil backfilling of trench.

2.06 PIPE JOINTS

A. Pipe shall be joined as specified herein:

1. Jointing Corrugated Polyethylene Drain Pipe - Corrugated external polyethylene couplers as provided by the pipe manufacturer shall be used. The joints shall be installed according to the manufacturer's specifications and as approved by the Civil Engineer.

2. Reinforced Concrete Pipe - ASTM C990-92.

3. PVCP Pipe – ASTM D 3034, SDR-35

2.07 STRUCTURES

A. General Requirements - All drainage structures shall be built in accordance with the details and at the locations shown on the Drawings and as specified herein. Where a specific material of construction is indicated, no substitution will be allowed unless authorized in writing by the Architect. Where more than one type of material of construction is indicated, the Contractor shall have the option of constructing the structure of any one of the materials specified. Precast concrete structures shall require shop drawing review by the Architect.

Cast-in-place concrete and/or masonry shall not be laid when the temperature is below 40 degrees F., or when indications are for lower temperatures within 24 hours, unless protection of concrete and masonry is established. In this event, the Contractor shall take measures to prevent concrete and masonry from being exposed to freezing temperatures for a period of not less than five (5) days after installation. Any damage to the structure because of freezing shall be corrected by the Contractor at his own expense.

All cast-in-place concrete and masonry shall be installed by personnel experienced and skilled in this work.

Manholes, drain inlets and catch basins are to be constructed as soon as the pipe laying reaches the location of the structures.

In constructing manholes, drain inlets and catch basins, the Contractor shall accurately locate each structure and set accurate templates to conform to the required line and grade. Any structure which is mislocated or oriented improperly shall be removed and rebuilt in its proper location, alignment and orientation at the Contractor's expense.

The Contractor shall use extreme care in the handling of precast concrete structures due to carelessness in handling or due to any of the Contractor's operations shall be repaired or replaced by the Contractor at his own expense.

Unless otherwise specified, all structures shall be constructed on concrete foundations. All foundations shall rest on firm soil of uniform bearing. If the soil beneath the foundation is unsuitable, the Contractor shall remove this unsuitable material as directed by the Soils Engineer and replace it with an approved properly compacted granular material conforming to the requirements of the Article of these Specifications entitled "Trench Excavation and Backfill" to the bottom elevation of the structure.

B. Masonry Structures (Where shown on civil plans and where permitted) - The first course of masonry shall be embedded in the concrete foundation immediately after the foundation has been poured. Brick masonry units shall be thoroughly wetted before laying.

All masonry shall be laid in a full bed of mortar, and all vertical and horizontal joints shall be filled solid with mortar. Vertical joints on each succeeding course shall be staggered. Joints shall be not less than three-eighths (3/8) inch or more than one-half (1/2) inch wide. Joints on the inside of the structure shall be neatly struck and pointed.

Where circular concrete block structures are specified or ordered to be constructed, they shall be designed and laid so that the interior surface of the structures are cylindrical for the straight sides and, except for shallow structures as specified below, the top sections shall be conical for the top courses, with no offsets, gradually diminishing in size to receive the castings of the types and sizes shown and/or specified. Concrete block units shall be designed so that only full length units are required to lay any one course. Cut block will not be allowed.

Corner units for rectangular concrete block structures must be "L" shaped with an inside return side equal to half the length of the normal unit. Units shall be designed so that only full length units are required to lay any one course.

Unless otherwise specified, the interior surface of the walls of masonry structures shall be painted upon completion with three (3) coats of neat cement grout without sand, applied with an interval of at least 24 hours between applications. The exterior surface of the walls of masonry structures shall be plastered with a one-half (1/2) inch coat of 1:2 cement mortar.

C. Cast-in-Place Concrete Structures - Cast-in-place concrete structures shall be constructed of Class "A" concrete with reinforcing as shown in detail on the Drawings and as specified herein.

Material and construction requirements shall be as specified under the Article of these Specifications entitled "Site Concrete".

D. Precast Concrete Structures - Precast concrete structures shall be installed only after shop drawings have been approved. All precast concrete structures shall be designed and fabricated for an H-20 design load.

The base of the precast concrete structures shall be set on a foundation pad of crushed stone eight (8) inches in compacted thickness. Foundations of all precast concrete structures shall rest on firm soil of uniform bearing. If soil beneath the foundation is unsuitable, the Contractor shall remove the unsuitable material as directed by the Soils Engineer and replace it with an approved properly compacted granular backfill material conforming to the requirements of the Article of these Specifications entitled "Trench Excavation and Backfill" to the bottom elevation of the crushed stone pad.

After pipes have been installed, all openings shall be properly sealed with non-shrinking cement mortar grout as directed. Grout around pipes which protrude through the walls of the structure and on all joints shall contain "Antihydro", or other approved additive, to insure watertightness. Cement grout shall contain one (1) part cement to two (2) parts sand by volume and additive in accordance with manufacturer's recommendations. Mortar shall be applied to the bottom one-third (1/3) of the opening before the pipe is inserted.

The precast concrete top section shall be set sufficiently below finished grade to permit a maximum of four (4) and a minimum of two (2) courses of eight (8) inch brick to be used as risers to adjust the grade of the casting. Manhole frames shall be set on a grout pad as specified herein above.

E. Shallow Circular Structures - For shallow circular structures, the top conical section shall be replaced by a flat reinforced concrete slab with the proper size opening to accommodate the

specified casting. The minimum thickness of the reinforced concrete slab shall be six (6) inches and shall be designed for an H-20 design load. In general, and unless otherwise specified or directed by the Site Engineer, the flat slab top shall be used for circular structures whose depth from pipe invert to finished grade is five (5) feet or less.

F. Inverts - Smooth invert channels shall be constructed in all manholes and in all drain inlets and catch basins which do not have sumps, to insure a smooth flow of water through the structure.

Invert channels for precast concrete structures shall be constructed of concrete; invert channels for masonry structures may be constructed of concrete or brick.

Extreme care shall be taken by the Contractor to construct invert channels to the shape, elevations and dimensions shown, specified or ordered by the Site Engineer.

When a curve in the invert channel or some other condition prevents the use of channels as shown on the Drawings, then such channels shall be constructed in accordance with the directions of the Civil Engineer/Architect.

When pipes entering and leaving a manhole are of different diameters, the invert channel shall be constructed so as to provide a smooth transition from the inflow pipe(s) to the outflow pipe.

The invert channel shall be carried up to the elevations shown on the Drawings. Channels shall slope smoothly and evenly from the inflow pipe(s) to the outflow pipe.

Split pipe for channels will be considered only in those instances where the drain line is of concrete pipe and the major inflow pipe and outflow pipe is of the same size and alignment.

Invert channels shall be built for future extensions where shown on the Drawings.

G. Frames and Covers/Grates - Frames and covers/grates for drain structures shall be of the types and sizes indicated on the Drawings. Frames shall be well bedded in mortar and shall be set accurately to the correct alignment and grade. In areas to be paved, frames shall be set by using four (4) points of reference, set 90 degrees apart, to insure accurate setting to proposed pavement grade.

Where drain inlets and/or catch basins are to be placed on curb lines or at edge of pavements, sufficient length of proposed curb or edge of pavement adjacent to the structure shall be established prior to construction of the drain inlet and/or catch basin to insure that the structure is correctly located and oriented.

H.

I. Steps - Steps shall be installed in all manholes. Steps shall also be installed in all drain inlets and catch basins greater than four (4) feet in depth unless otherwise specified.

Steps shall be set securely in place during the construction of the wall for masonry structures and during fabrication of the wall section for precast concrete structures.

2.08 CONNECTIONS TO EXISTING FACILITIES

A. General Requirements - The Contractor shall make all required connections of the proposed drainage facilities into existing drainage facilities, where and as shown on the Drawings.

B. Compliance with Requirements of Owner of Facility - Connections made into existing drainage facilities shall be done in accordance with the requirements of the owner of the facility and the jurisdiction. The Contractor shall be required to comply with all such requirements, including securing of all required permits and paying the costs thereof. The cost of making the connections in accordance with the requirements of the owner of the existing facility shall be included in the Contract Sum.

2.09 ALTERATION, RECONSTRUCTION AND/OR CONVERSION OF EXISTING STRUCTURES

A. General Requirements - The Contractor shall alter, reconstruct and/or convert existing structures where as shown on the Drawings. In general, alterations shall be made with the same type of material used in the original construction unless otherwise indicated on the Drawings.

B. Adjustment to New Grade and Alignment - All castings on existing drainage structures that are to remain shall be adjusted to new grade and alignment. When such adjustment is required the castings shall be carefully removed and the walls of the structures reconstructed as required. The castings shall be cleaned and reset in a firm mortar bed to the new grade and alignment. Existing castings which are broken, damaged or otherwise unfit for incorporation into the new work shall be replaced under the Contract Sum.

C. Structures to be Converted - Structures which are to be converted (e.g. manholes to drain inlets or catch basins, drain inlets or catch basins to manholes) shall conform as closely as possible to the design of the proposed structure. Sufficient masonry shall be removed from the existing structure to insure that the walls can be rebuilt to conform to the proposed construction. Furnishing and installation of new castings for the converted structures shall be included in the Contract Sum.

D. Removal of Portions of Wall of Existing Structures - In all cases of alteration, reconstruction and/or conversions of existing structures, existing walls shall be removed to a point where the existing walls will provide sound and adequate foundation for the construction of the new walls.

E. Reconstruction and/or Rebuilding of Existing Invert -Where new pipes are to be installed into an existing structure, the existing invert shall be reconstructed and/or rebuilt as directed to accommodate installation of the new pipes and provide for proper transition of flows into and out of the structure.

F. Damage to Existing Structure and/or Pipe - The Contractor shall exercise extreme care during such alteration, reconstruction and/or conversions so as not to damage any portions of the structure and/or pipe shown to remain. Any such damage shall be repaired by the Contractor at his own expense.

G. Structures to be Cleaned - Upon completion of alteration, reconstruction and/or conversion of existing structures, all structures shall be cleaned of any accumulation of silt, debris or foreign matter of any kind and shall be kept clean of such accumulation until final acceptance of work.

2.10 RELOCATION AND/OR ABANDONMENT OF EXISTING FACILITIES

A. The Contractor shall not abandon, disconnect, obstruct or in any other way interfere with the operation of an existing storm drain facility until such time as adequate permanent or temporary substitute facilities have been constructed and placed in operation.

2.11 LEADER DRAINS

A. General Requirements - The Contractor shall make all required connection(s) of the building leader drain(s) into the on-site drainage system whether shown or not on the Drawings. Work shall include making the leader drain connection(s) into the on-site drainage system, furnishing and installing all leader drain pipe form the on-site drainage system to the building leader drains. The connection(s) shall be made with proper fittings and/or adapters compatible with the building leader drains providing watertight connection(s) and shall be done at no additional cost to the Owner. Connect all downspouts to subterranean storm water collection pipe system, whether shown specifically on drawings or not.

B. Coordination with Building Plumbing Contractor - The Contractor will be required to coordinate his work with the work of the building plumbing contractor to determine the exact location(s) and elevation(s) of the point(s) of entry into the building(s) prior to construction.

C. Connection into On-Site Drainage System - Leader drain connection(s) to the on-site drainage system shall be made at structure(s) or into the pipe where and as shown on the Drawings at every roof leader and downspout on exterior building walls. Pipe connections shall be made with proper size and type tee and/or wye fittings supplied by the pipe manufacturer.

2.12 UNDERDRAINS

A. General Requirements - The Contractor shall install all underdrains where and as shown on the Drawings.

B. Pipe Installation - A minimum of four (4) inch layer of approved underdrain filter material shall be placed and compacted in the bottom of the trench as a bedding for the pipe. Underdrain pipe of the type and size specified shall be embedded firmly in this bedding material to the line and grade shown on the Drawings.

Unless otherwise specified, perforated pipe shall be laid with the perforations down and the pipe sections shall be jointed securely with the appropriate fittings or bands. Upgrade ends of pipe underdrains shall be closed with suitable plugs.

C. Backfilling - After the pipe installation has been inspected and approved, underdrain filter material shall be hand-shoveled around and over the pipe to such a depth that, after compaction, it extends a minimum of four (4) inches above the underdrain pipe. The surface of the underdrain filter material shall then be compacted with a vibrating pad compactor, and the remainder of the filter material shall be placed in lifts not more than six (6) inches in thickness with each lift thoroughly compacted with a mechanical vibrating pad compactor. The height of filter material over all pipe shall be as indicated on the Drawings.

D. Geotextile Fabric - Geotextile fabric shall be placed where and as shown in detail on the Drawings. Ends and sides of fabric shall be lapped a minimum of twelve (12) inches.

E. Pipe Connections and Changes in Alignment - Pipe to pipe connections and changes in pipe alignment shall be made only with prefabricated fittings to be supplied by the manufacturer of the pipe (e.g. tees, wye branches, etc.).

2.13 CLEANING AND REPAIR

A. The Contractor shall clean the entire drainage system of all debris and obstructions. This shall include, but not be limited to, removal of all formwork from structures, concrete and mortar droppings, construction debris and dirt. The system shall be thoroughly flushed clean and the Contractor shall furnish all necessary hose, pumps, pipe and other equipment that may be required for this purpose. No debris shall be flushed into existing storm drains or streams. All debris shall be removed from the system.

After the system has been cleaned, the Contractor shall thoroughly inspect the system and all repairs shown to be necessary shall be promptly made by the Contractor.

All work of cleaning and repair as specified herein and as required by jurisdiction inspectors shall be done at the Contractor's expense.

2.14 FINAL TESTS AND INSPECTIONS

A. Upon completion of the Work and before final acceptance by the Owner, the entire drainage system shall be subjected to an inspection in the presence of the Owner's Field Representative. The Work shall not be considered as complete until all design and jurisdiction requirements for line, grade cleanliness, and workmanship have been met.

PART 3 - MATERIALS

The materials to be used in the construction shall be those indicated on the Drawings and specified herein. The Contractor shall supply to the Architect, prior to installation, certificates of compliance for the materials used. The Contractor shall also submit shop drawings and catalog cuts of all storm drain items and appurtenances (pipe, fittings, joints, castings, steps, precast concrete structures, etc.) to the Architect for approval prior to ordering.

3.01 STORM DRAIN PIPE, FITTINGS AND JOINTS

A. Corrugated Polythylene Drain Pipe and Fittings (CPDP) - shall have a smooth interior and conform to the requirements of AASHTO Designation M-294. Pipe shall be Hi-Q Pipe as manufactured by Hancor or approved equal or as indicated on drawings with same requirements.

B. Underdrains - Pipe, Fittings and Filter Materials

1. Perforated Polyvinyl Chloride Pipe (PPVCP) - shall conform to the requirements of AASHTO Designation M-278, and shall be Perforated Highway Underdrains and Fittings as manufactured by Carlon or approved equal.

2. Filter Material - shall be approved crushed aggregate meeting the requirements of ASTM Designation C-33, size No. 57.

3. Filter Fabric - shall be Mirafi 140N or approved equal.

C. Polyvinyl Chloride Pipe and Fittings For Gravity Lines (PVCP)

1. Shall conform to the requirements of ASTM Designation D-3034 for SDR-35 extra strength pipe and fittings. Pipe shall have integral wall bell and spigot joints. Assembly shall be by means of push-on joints using flexible elastomeric seals conforming to ASTM Designation D-3212.

   All fittings and accessories shall be furnished by the pipe manufacturer. Joint lubricant shall be as recommended by the pipe manufacturer.

2. PVC pipe shall have common profiles for inter-changeability between rough-barrel dimensions, couplings, ends, and elastomeric gaskets to facilitate future repairs. When assembled, the pipe shall have only one gasket per bell and spigot end, and/or two gaskets per coupling.

3. Sewer pipe shall be furnished in standard 3.96m or 6.10m (13' or 20") lengths, unless otherwise detailed or required on the Approved Plans.

5. Follow the Manufacturer's recommendations for the minimum allowable radius for the size of pipe used.

6. All pipe, fittings, and couplings shall be clearly marked in accordance with ASTM D3034, F679, and F794, respectively.

6. All pipe shall have a home mark on the spigot end to indicate proper penetration when the joint is made.

3.02 STRUCTURES

A. General - Where material requirements specified hereinafter conflicts with the requirements of Authorities having jurisdiction, the requirements of the Authority having jurisdiction shall govern.

B. Brick - shall conform to the "Specifications for Sewer and Manhole Brick (made from Clay or Shale)", AASHTO Designation M-91, Grade MS.

C. Concrete Block - shall be solid block and shall conform to the "Specifications for Concrete Masonry Units for Construction of Catch Basins and Manholes", ASTM Designation C-139.

D. Precast Concrete Structures - Prior to fabrication, the Contractor shall submit four (4) sets of plans of the proposed precast concrete structures to the Site Engineer for approval along with design criteria and certification by the manufacturer that the structure will support the design load. Unless specified otherwise, precast concrete structures shall be designed for an H-20 design load.

   Precast concrete manhole sections shall conform to ASTM Designation C-478. Joints for manhole sections shall conform to ASTM Designation C-443.

   The minimum compressive strength of the concrete used for all precast structures shall be 4,000 psi. Where steps are required in structures, steps shall be installed during the casting of the structures, aligned as specified herein. Joints in the structures shall be tongue and groove joints, formed in such a manner so that a watertight rubber seal can be applied.

   No precast concrete structure shall be fabricated or delivered to the job site until it has been reviewed by the Architect. All structures shall have an identifying number and manufacturer's name on each section.

When precast concrete structures are to be used, the Contractor shall bear all responsibility for the proper locations and sizes of all openings to receive the pipe. The review of shop drawings by the Architect shall not relieve the Contractor of his responsibility in this matter. Should field revisions to the structure be necessary due to improper location of openings or unforeseen field conditions such as line and/or grade changes, deletion of structures, relocation of structures, or addition or deletion of lines to be connected into the structures, then the Contractor will be required to make all necessary and required revisions to the satisfaction of the Architect and at no additional cost to the Owner.

E. Manhole Frames and Covers - shall be as specified on the Drawings. Castings shall be gray cast iron, American made by a nationally recognized casting manufacturer conforming to the requirements of AASHTO Designation M-105, Class 30 and shall be true to pattern in form and dimensions as specified, free from pouring faults, sponginess, cracks, blowholes and other defects that affect their strength and other characteristics for the intended use. All surfaces have a workmanlike finish.

All component parts shall fit together in a satisfactory manner and frames and covers shall be of a design that will prevent rocking or rattling under traffic. Frames and covers that are warped or rocking shall be rejected and shall be removed and replaced.

Unless otherwise specified, the word "STORM" shall be integrally cast on the cover in raised letters and centered. Letter size shall be two (2) inches.

If directed, and at no additional cost to the Owner, castings shall be coated with an asphalt paint which shall result in a smooth coating and not be tacky or brittle.

F. Drain Inlet and Catch Basin Frames and Grates - shall be as specified on the Drawings and in accordance with the following requirements and shall be American made by a nationally recognized casting manufacturer:

1. Cast Iron - shall be gray cast iron castings conforming to the requirements of AASHTO Designation M105, Class 30. All requirements of workmanship and material as specified for manhole castings shall apply herein. If directed, and at no additional cost to the Owner, castings shall be coated with an asphalt paint which shall result in a smooth coating and not be tacky or brittle.

All component parts of the frames and grates shall fit together in a satisfactory manner and frames and covers shall be of a non-rocking design so as to prevent rocking or rattling under traffic. Frames and grates that are warped or rocking shall be rejected and shall be removed and replaced by the Contractor.

G. Concrete and Reinforcing - shall conform to the requirements as specified under the Section of these Specifications entitled "Site Concrete".

H. Mortar - shall be composed of one (1) part Portland cement and two (2) parts sand by volume. Material requirements shall be as follows:

1. Portland Cement - shall conform to the requirements of AASHTO Designation M-85.

2. Mortar Sand - shall conform to the requirements of AASHTO Designation M-45, except that aggregate shall be no coarser than #8 sieve size.

3. Water - shall be clean and shall not contain any oil, acid, alkali, salts, vegetable matter, organic matter or other deleterious substances. When possible, water shall be from a municipal system.

Hand mixing of mortar will be permitted only when the amount of mortar to be used makes machine mixing undesirable. When hand mixing is used, the ingredients must first be thoroughly mixed dry in a tight box. The proper quantity of clean water shall then be gradually added, and the materials shall be hoed or worked until a uniform mixture is secured. Admixtures may not contain calcium chloride.

No greater quantity of mortar is to be prepared than is required for immediate use, and it shall be worked over constantly with hoe or shovel until used. No mortar shall be retempered, and none shall be used more than one and one-half (1-1/2) hours after mixing. All mortar which remains upon stopping work shall be discarded.

I. Steps - Steps in drainage structures shall be as specified herein and on the details of the Drawings and shall meet the requirements for steps and ladders as specified under ASTM Designation C-478.

1. Malleable or Ductile Cast Iron - shall be designed for a minimum design live load of a single concentration of 300 pounds. Material shall be of Iron, Class 25A, in accordance with ASTM Designation A-48 or Malleable Iron, Grade 35018 in accordance with ASTM Designation A-47.

2. Plastic Coated Steel - shall be No. 4 deformed reinforcement bar meeting the requirements of ASTM Designation A-615, Grade 60 which shall be coated with polypropylene plastic meeting the requirements of ASTM Designation D-2146 for Type II, Grade 49108.

All steps shall be true to pattern, form dimensions, and free from defects which would affect their strength. Steps having defects filled with putty or cement of any kind shall be rejected.

END OF SECTION

SECTION 02751 - CEMENT CONCRETE PAVEMENT

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. Section Includes:

1. Driveways
2. Roadways.
3. Parking lots.
4. Curbs and gutters.
5. Walks.

B. Related Sections:

1. Division 2 Section "Earthwork".

2. Division 2 Section "Pavement Joint Sealants" for joint sealants in expansion and contraction joints within concrete paving and in joints between concrete paving and asphalt paving or adjacent construction.

3. Division 3 Section "Cast-in-Place Concrete" for general building applications, site walls and other structural elements of concrete.

1.3 REFERENCES

A. Organization and Trade Standards
1. Standard Specifications for Public Works Construction, latest edition, as adopted by local jurisdictional authority, including amendments.
2. Regional Standard Drawings, current edition, with all local agency amendments.

1.4 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

1.5 SUBMITTALS

A. Mix Design/Materials List:

1. Submit concrete mix design prepared by a certified batch plant or laboratory, selected by Contractor and acceptable to Owner, for review and approval.

2. Accompanying mix design, submit materials certificates signed by material producer and Contractor, certifying that each material item complies with, or exceeds, specified requirements. For the following, from manufacturer:
   a. Cementitious materials.
   b. Steel reinforcement and reinforcement accessories.
   c. Admixtures.
   d. Curing compounds.
   e. Joint fillers.

B. Other Action Submittals:

1. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Samples for Verification: For each type of product or exposed finish, prepared as Samples of size indicated below:

1. Exposed Aggregate: 10-lb (4.5-kg) Sample of each mix.
2. Wheel Stops: 6 inches (150 mm) long showing cross section; with fasteners.

D. Material Test Reports: For each of the following:

1. Aggregates. Include service-record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.

E. Shop Drawings: Show locations and layout of isolation (expansion) joints and contraction (control) joints.

F. Mock-up
1. Prior to installing any concrete paving, construct, at an approved location on-site, an individual mock-up showing each concrete paving finish specified and shown on drawings. Mock-up shall include sealant joint preparation. Each finish shall be 4' x 4' minimum. Obtain Architect's approval of mock-up.
2. All concrete paving shall match approved mock-up.
3. Remove mock-up after completion of work and dispose off-site.

1.6 QUALITY ASSURANCE

A. Ready-Mix-Concrete 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.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").

B. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

C. Concrete Testing Service: Engage a qualified testing agency to perform material evaluation tests and to design concrete mixtures.

D. ACI Publications: Comply with ACI 301 (ACI 301M) unless otherwise indicated.

1.7 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F (4.4 deg C) for oil-based materials or 55 deg F (12.8 deg C) for water-based materials, and not exceeding 95 deg F (35 deg C).

PART 2 - PRODUCTS

2.1 DESIGN CRITERIA

A. General
1. All improvements shall be constructed per the referenced standards, the contract documents, and as specified in this section.
2. Where criteria shown on drawings or specified in this specification exceed that of the referenced standards, the more stringent criteria shall apply.

2.2 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet (30.5 m) or less. Do not use notched and bent forms.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.3 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420); deformed.

B. Plain-Steel Wire: ASTM A 82/A 82M.

C. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420) plain-steel bars; zinc coated (galvanized) after fabrication according to ASTM A 767/A 767M, Class I coating. Cut bars true to length with ends square and free of burrs. Provide polyethylene closed-end sleeve or approved alternate at expansion joint dowels

D. Where deformed bar reinforcing not shown, provide welded wire fabric, flat sheet stock, 12x12-W2.8x2.8 or approved equivalent, per ASTM A-185, at all concrete paving conditions.

E. Tie Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

F. Hook Bolts: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), internally and externally threaded. Design hook-bolt joint assembly to hold coupling against paving form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

G. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

H. Zinc Repair Material: ASTM A 780.

2.4 CONCRETE MATERIALS

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

1. Portland Cement: ASTM C 150, gray portland cement Type II, low alkali, produced in the United States. Supplement with the following:

   a. Fly Ash: ASTM C 618, Class C.
   b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

B. Normal-Weight Aggregates: ASTM C 33, uniformly graded. Provide aggregates from a single source with documented service-record data of at least 10 years' satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Coarse-Aggregate Size: 1 inch (25 mm) nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Exposed Aggregate: Selected, hard, and durable; washed; free of materials with deleterious reactivity to cement or that cause staining; from a single source, with gap-graded coarse aggregate as follows:

1. Aggregate Sizes: [**3/4 to 1 inch (19 to 25 mm)**] [**1/2 to 3/4 inch (13 to 19 mm)**] [**3/8 to 5/8 inch (10 to 16 mm)**] <**Insert dimensions**> nominal.
2. Aggregate Source, Shape, and Color: <**Insert requirements**>.

D. Water: Potable and complying with ASTM C 94/C 94M.

E. Chemical Admixtures: Admixtures 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.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.

2.5 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry.

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

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Axim Italcementi Group, Inc.; Caltexol CIMFILM.
b. BASF Construction Chemicals, LLC; Confilm.
c. ChemMasters; Spray-Film.
d. Conspec by Dayton Superior; Aquafilm.
e. Dayton Superior Corporation; Sure Film (J-74).
f. Edoco by Dayton Superior; BurkeFilm.
g. Euclid Chemical Company (The), an RPM company; Eucobar.
h. Kaufman Products, Inc.; VaporAid.
i. Lambert Corporation; LAMBCO Skin.
j. L&M Construction Chemicals, Inc.; E-CON.
k. Meadows, W. R., Inc.; EVAPRE.
l. Metalcrete Industries; Waterhold.
m. Nox-Crete Products Group; MONOFILM.
n. Sika Corporation, Inc.; SikaFilm.
o. SpecChem, LLC; Spec Film.
p. Symons by Dayton Superior; Finishing Aid.
q. TK Products, Division of Sierra Corporation; TK-2120 TRI-FILM.
r. Unitex; PRO-FILM.
s. Vexcon Chemicals Inc.; Certi-Vex EnvioAssist.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

1. Products: Basis of Design - Provide Burke Aqua Resin, with fugitive dye, and complying with ASTM C309, Type 1-D at all natural color concrete curbing and non-paving applications.

2. Products: Basis of Design - Provide Scofield Lithochrome Colorwax curing compound, VOC compliant formulation, at all integral colored concrete paving.

3. Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Anti-Hydro International, Inc.; A-H Curing Compound #2 DR WB.
b. ChemMasters; Safe-Cure Clear.
c. Conspec by Dayton Superior; D.O.T. Resin Cure.
d. Dayton Superior Corporation; Day-Chem Rez Cure (J-11-W).
e. Edoco by Dayton Superior; DSSCC Clear Resin Cure.
f. Euclid Chemical Company (The), an RPM company; Kurez W VOX.
g. Kaufman Products, Inc.; Thinfilm 420.
h. Lambert Corporation; AQUA KURE - CLEAR.

i. L&M Construction Chemicals, Inc.; L&M CURE R.
j. Meadows, W. R., Inc.; 1100-CLEAR SERIES.
k. Nox-Crete Products Group; Resin Cure E.
l. SpecChem, LLC; PaveCure Rez.
m. Symons by Dayton Superior; Resi-Chem Clear.
n. Tamms Industries, Inc., Euclid Chemical Company (The); TAMMSCURE WB 30C.
o. TK Products, Division of Sierra Corporation; TK-2519 WB.
p. Vexcon Chemicals Inc.; Certi-Vex Enviocure 100.

4. Cure and Sealing Compound
   a. Products: Basis of Design - Provide Burke Spartan-Cote WB, complying with ASTM C309, Type 1-A and B, at natural color exterior concrete paving.

2.6 PAVING BASE

A. Where shown on drawings, provide crushed aggregate base per Section 200-2.2.1 of the Standard Specification for Public Works Construction "Greenbook".

2.7 RELATED MATERIALS

A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber in preformed strips.

B. Expansion Joint Material: W. R. Meadows or equal, Sealtight Fiber filler, full depth of slab, matching profile, 1/2 inch thickness or as shown on drawings.

C. Expansion Joint Material - Radius Conditions: W. R. Meadows or equal, Sealtight Ceramar flexible foam resilient filler, full depth of slab, 3/8 inch thickness or as shown on drawings.

D. Joint Cap: W. R. Meadows or equal, SealTight Snap Cap, size required for expansion material.

E. See Division 2, "Pavement Joint Sealant" for sealant use after removal of Snap Cap.

2.8 PAVEMENT MARKINGS

A. Pavement-Marking Paint: MPI #97 Latex Traffic Marking Paint.

   1. Color: White, Yellow, Blue or as indicated.

B. Pavement-Marking Paint for painted lines and markings for accessible and disabled parking and site access:

   1. Color: Blue in color equal to Color No. 15090 per Federal Standard 595B.

   2. Width: Painted lines and markings on pavement shall be 3" minimum wide.

   3. Parking spaces for disabled shall be marked according to CBC Section 1129B.3.

   4. Tactile warning lines shall be in conformance to CBC Section 1133B.8.3, 1133B.8.4 and 1133B.8.5.

C. Glass Beads: AASHTO M 247, Type 1.

2.9 WHEEL STOPS

A. Wheel Stops: Precast, air-entrained concrete, 2500-psi (17.2-MPa) minimum compressive strength, 4-1/2 inches (115 mm) high by 9 inches (225 mm) wide by 72 inches (1820 mm) long. Provide chamfered corners and drainage slots on underside and holes for anchoring to substrate.

1. Dowels: Galvanized steel, 3/4 inch (19 mm) in diameter, 10-inch (254-mm) minimum length.

2.10 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301 (ACI 301M) and Public Works Construction Standard Specifications (Green Book), for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that meet or exceed requirements.

B. Product Characteristics: Paving/flatwork/ramps/stairs:
1. Compressive Strength: 3250 psi. Strength selected for durability. Concrete is non-structural, and does not require special inspection.
2. Combined Aggregate Grading:
   a. Class C per Standard Specification for Public Works Construction "Greenbook" Section 201-1.3.2
   b. Aggregate shall be non-reactive per ASTM C 289, and shall comply with ASTM C33, Table 3, Class 4M.
3. Cement Content: 560 pounds per cubic yard concrete
4. Slump: 4 inch maximum
5. Finish:
   a. Broom finish natural concrete paving.
   b. Broom finish integral color concrete paving.
6. Water-Cement Ratio: 0.55 maximum.
7. Integral Color Admixture: Scofield Chromix or equal.
8. Surface Retarder: Scofield Lithotex Top Surface Retarder or equal.

C. Product Characteristics: Curbing, gutters, related drainage components.
1. Compressive Strength: 3250 psi
2. Combined Aggregate Grading:
   a. Class C per Standard Specification for Public Works Construction "Greenbook" Section 201-1.3.2
3. Cement Content: 520 pounds per cubic yard concrete
4. Slump: 4 inch maximum
5. Finish: Per Section 303-5.5.2 of Standard Specifications for Public Woks Construction, "Greenbook," and with flatwork finishes as defined in this Section and per Drawings.

D. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

E. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing admixture in concrete as required for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

F. Cementitious Materials: Limit percentage by weight of cementitious materials other than portland cement according to ACI 301 (ACI 301M) requirements for concrete exposed to deicing chemicals. As follows:

1. Fly Ash or Pozzolan: 25 percent.
2. Ground Granulated Blast-Furnace Slag: 50 percent.
3. Combined Fly Ash or Pozzolan, and Ground Granulated Blast-Furnace Slag: 50 percent, with fly ash or pozzolan not exceeding 25 percent.

2.11 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperatue is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph (5 km/h).
2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch (13 mm) according to requirements in Division 2 Section "Earthwork."

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Verify sub-grade, base material, conduit, and all other embedded items are properly located in relation to concrete paving. Secure all embedded items against displacement during pour.

B. Verify all grades for pitch and fall prior to pouring pavements.

C. Verify that all cross-fall and ramp criteria comply with all accessibility regulations, including Title 24 requirements.

D. Verify compaction of existing subgrade complies with criteria specified in Division 2, "Earthwork."

E. Notify inspector 48 hours prior to placing concrete. Obtain inspectors approval of subgrade, forming and embedded items prior to placing.

F. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides 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. Coat forms with approved bond breaker, suitable for use on integral colored concrete without staining or discoloration. Place sand bed over existing paving receiving new concrete paving.

3.4 STEEL REINFORCEMENT

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

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Zinc-Coated Reinforcement: Use galvanized-steel wire ties to fasten zinc-coated reinforcement. Repair cut and damaged zinc coatings with zinc repair material.

3.5 JOINTS

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

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

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

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
2. Provide tie bars at sides of paving strips where indicated.
3. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys unless otherwise indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.

4. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

C. Isolation (Expansion) Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

1. Provide expansion joints at intervals of 50 feet (15.25 m) unless otherwise indicated.

2. Provide where paving is adjacent to walls, bollard or column penetrations, light pole, utility box or footings.

3. Provide at pavement plazas and fields, approximately 20 feet on center each way, and as necessary to limit area to a maximum of 400 square feet.
4. Extend joint fillers full width and depth of joint and terminate not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
5. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
6. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together
7. Tool all edges adjacent to expansion material with maximum 1/8 inch radius tool..
8. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint and provide bondbreaker tape at surface of joint material cover cap.
9. Provide sealant and backer rod assembly per Division 2, "Pavement Joint Sealants" when provided, if not see Division 7, "Joint Sealants" and as shown on drawings

D. Contraction (Control) Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows, to match jointing of existing adjacent concrete paving:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch (6-mm) radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate grooving-tool marks on concrete surfaces.

   a. Tolerance: Ensure that grooved joints are within 3 inches (75 mm) either way from centers of dowels.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch (3-mm) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

   a. Tolerance: Ensure that sawed joints are within 3 inches (75 mm) either way from centers of dowels.

3. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.
4. Provide at curbs, curb and gutter assemblies, and cross gutters at 20 feet on center maximum. Where concrete pavement occurs adjacent to curb, align curb and pavement joints.
5. Provide at pavement plazas and fields, approximately 10 feet on center each way, and as necessary to limit area to a maximum of 100 square feet.
6. Provide at pavement areas at all re-entrant corners and at changes in direction.
7. Provide control (weakened plane) joints by saw cutting method, hand held jointing tools, or by use of SOF-CUT equipment. Use of zip-strip not acceptable.

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch (6-mm) radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.

B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 (ACI 301M) requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

F. 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.

G. Consolidate concrete according to ACI 301 (ACI 301M) by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels and joint devices.

H. Screed paving surface with a straightedge and strike off.

I. 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.

J. Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.

K. Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.

1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.

L. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

1. When air temperature has fallen to or is expected to fall below 40 deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.

2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

M. Hot-Weather Placement: Comply with ACI 301 (ACI 301M) and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.7 FLOAT 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 float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.

2. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch (1.6 to 3 mm) deep with a stiff-bristled broom, perpendicular to line of traffic.

3.8 SPECIAL FINISHES

A. Monolithic Exposed-Aggregate Finish: Expose coarse aggregate in paving surface as follows:

1. Immediately after float finishing, spray-apply chemical surface retarder to paving according to manufacturer's written instructions.
2. Cover paving surface with plastic sheeting, sealing laps with tape, and remove when ready to continue finishing operations.
3. Without dislodging aggregate, remove mortar concealing the aggregate by lightly brushing surface with a stiff, nylon-bristle broom. Do not expose more than one-third of the average diameter of the aggregate and not more than one-half of the diameter of the smallest aggregate.
4. Fine-spray surface with water and brush. Repeat cycle of water flushing and brushing until cement film is removed from aggregate surfaces to depth required.

B. Seeded Exposed-Aggregate Finish: Immediately after initial floating, spread a single layer of aggregate uniformly on paving surface. Tamp aggregate into plastic concrete and float finish to entirely embed aggregate with mortar cover of 1/16 inch (1.6 mm).

1. Spray-apply chemical surface retarder to paving according to manufacturer's written instructions.

2. Cover paving surface with plastic sheeting, sealing laps with tape, and remove sheeting when ready to continue finishing operations.
3. Without dislodging aggregate, remove mortar concealing the aggregate by lightly brushing surface with a stiff, nylon-bristle broom. Do not expose more than one-third of the average diameter of the aggregate and not more than one-half of the diameter of the smallest aggregate.
4. Fine-spray surface with water and brush. Repeat cycle of water flushing and brushing until cement film is removed from aggregate surfaces to depth required.

C. Slip-Resistive Aggregate Finish: Before final floating, spread slip-resistive aggregate finish on paving surface according to manufacturer's written instructions and as follows:

1. Uniformly spread [**25 lb/100 sq. ft. (12 kg/10 sq. m)**] [**40 lb/100 sq. ft. (19.5 kg/10 sq. m)**] [**60 lb/100 sq. ft. (29 kg/10 sq. m)**] <**Insert rate of application**> of dampened, slip-resistive aggregate over paving surface in two applications. Tamp aggregate flush with surface using a steel trowel, but do not force below surface.
2. Uniformly distribute approximately two-thirds of slip-resistive aggregate over paving surface with mechanical spreader, allow to absorb moisture, and embed by power floating. Follow power floating with a second slip-resistive aggregate application, uniformly distributing remainder of material at right angles to first application to ensure uniform coverage, and embed by power floating.
3. Cure concrete with curing compound recommended by slip-resistive aggregate manufacturer. Apply curing compound immediately after final finishing.
4. After curing, lightly work surface with a steel wire brush or abrasive stone and water to expose nonslip aggregate.Retain first paragraph below for rock-salt finish. Avoid this finish if water may be trapped and frozen in pitted surface. Revise weight of salt and procedure according to texture desired. Verify weight of salt on Project mockup if necessary.

3.9 CONCRETE PROTECTION AND CURING

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

B. Comply with ACI 306.1 for cold-weather protection.

C. 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 (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

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

E. Curing Methods: Cure concrete by moisture curing moisture-retaining-cover curing, curing compound, or a combination of these as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

   a. Water.
   b. Continuous water-fog spray.
   c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm) and sealed by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas that have been subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating, and repair damage during curing period.

4. Cure all integral color concrete with Lithochrome curing wax, applied as directed by Scofield. Do not permit overspray onto natural colored concrete.

3.10 PAVING TOLERANCES

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

1. Level: 3/16 inch plus or minus, at any point, measured along a 10 foot straight edge.
2. Adjacent surfaces: 1/8 inch maximum difference at any point between adjacent concrete pours or between paving and adjacent paving materials.
3. Joint Alignment: 1/16 inch deviation from adjacent joint.
4. Line: 1/4 inch, plus or minus, deviation from a straight line in any 10 foot length, non-cumulative.
5. Final elevations shall comply with grades as shown on drawings, to a tolerance of plus or minus 0.25 inch.
6. Tolerances do not permit violation of dimensions or grade and slopes relationships required by code or jurisdictional authority. Adjust work as required to comply with such requirements.

3.11 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Allow concrete paving to cure for a minimum of 28 days and be dry before starting pavement marking.

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

D. Apply paint with mechanical equipment to produce markings of dimensions indicated with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils (0.4 mm).

1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to concrete surface. Mask an extended area beyond edges of each stencil to prevent paint application beyond stencil. Apply paint so that it cannot run beneath stencil.
2. Broadcast glass beads uniformly into wet markings at a rate of 6 lb/gal. (0.72 kg/L).

3.12 WHEEL STOPS

A. Install wheel stops in bed of adhesive applied as recommended by manufacturer.

B. Securely attach wheel stops to paving with not less than two galvanized-steel dowels located at one-quarter to one-third points. Install dowels in drilled holes in the paving and bond dowels to wheel stop. Recess head of dowel beneath top of wheel stop.

3.13 FIELD QUALITY CONTROL

A. Flood Test
1. Provide flood test of all gutters and paving as directed by Architect.
2. Where ponding occurs, or where drainage rate is less than that established by original design, replace all defective concrete. Remove concrete to the nearest joint line.

B. Appearance
1. Remove and replace concrete not matching approved mock-up, concrete not complying with specified tolerances, and concrete with the following defects.
   a. Inconsistent texture.
   b. Irregular or misaligned direction of texture.
   c. Concrete with spalled or raveled control or expansion joints.
   d. Concrete exhibiting splotching or discoloration in surface including discoloration due to "carbonation".
   e. Concrete exhibiting cracking, including shrinkage cracking, where cracks are located between joint pattern.

2. Use of patching mortar for repair of edge defects is subject to acceptance of final color and texture by Architect. Use of patching mortar not acceptable for repair of defective exposed aggregate finished concrete.

C. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.

   a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when it is 80 deg F (27 deg C) and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.

   a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

D. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).

E. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

F. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

G. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

H. Concrete paving will be considered defective if it does not pass tests and inspections.

I. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

J. Prepare test and inspection reports.

3.14 REPAIRS AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Use of patching mortar for repair of edge defects is subject to acceptance of final color and texture by Architect. Use of patching mortar not acceptable for repair of defective exposed aggregate finished concrete.

C. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

D. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

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

END OF SECTION 02751

SECTION 02810 - IRRIGATION SYSTEM

GENERAL

1. Permits
   a. Contractor shall obtain and pay for all permits required for irrigation installation.

2. Manufacturer's Directions
   a. Manufacturer's directions and detailed drawings shall be followed in all cases where the manufacturers of articles used in this Contract furnish directions covering points not shown in the Drawings and Specifications.

3. Ordinances and Regulations:
   a. Comply with all local, municipal and state laws, rules and regulations.
   b. Conform to applicable provisions of the latest editions of the Uniform Plumbing Code, the National Electric Code and all codes properly governing the materials and work at the project site.

4. Explanation of Drawings
   a. Due to the scale of the Drawings, it is not possible to indicate all offsets, fittings, sleeves, etc., which may be required. The Contractor shall carefully investigate the structural and finished conditions affecting all of his work and plan his work accordingly, furnishing such fittings, etc., as may be required to meet such conditions. Drawings are generally diagrammatic and indicative of the work to be installed. The work shall be installed in such a manner as to avoid conflicts between the irrigation system, planting, underground utilities, above ground utilities and architectural features.
   b. All work called for on the Drawings by notes or details shall be furnished and installed whether or not specifically mentioned in the Specifications.
   c. The Contractor shall not willfully install the irrigation system as shown on the Drawings when it is obvious in the field that obstructions, grade differences, or discrepancies in area dimensions exist that might not have been considered in engineering. Such obstructions or differences should be brought to the attention of the City's Authorized Representative. In the event this notification is not performed, the Contractor shall assume full responsibility for any revision necessary.

5. AS BUILT DRAWINGS
   a. Record accurately on one set of black and white prints (irrigation drawings), all changes in work constituting departures from the original contract drawings. Include changes in both pressure and non-pressure lines.
   b. Upon completion of each increment of work, transfer all such information and dimensions to the prints. Record changes and dimensions in a legible and professional manner. When the drawings are approved, the Contractor shall perform all final as-built drawings.
   c. Dimension from two permanent points of reference (monuments, sidewalks, curbs, pavement). Record information on as-built drawings day-to-day as the work is installed. All dimensions noted on the drawings shall be 1/4 inch in size.
   d. Show dimensional locations and depths of the following:
      1. Connection to existing water lines.
      2. Connection to existing electrical power.
      3. Point of connection – including backflow assembly, basket strainer, master valve, flow sensor
      4. Gate valves
      5. Routing of sprinkler pressure lines (dimension max. 100' along routing and at each change of direction).
      6. Electric control valves.
      7. Routing of control wiring and flow sensor cable.
      8. Quick coupling valves
      9. Sleeves and wire splice boxes

10. Other related equipment as directed by the City's Authorized Representative.

e. Maintain as-built drawings on site at all times

6. CONTROLLER CHARTS
   a. As-built drawings shall be provided by the Contractor prior to the preparation of the Controller Charts. As-builts shall be drawn on 3 mil sepia mylar of same size as construction documents.
   b. The Contractor shall provide two 11 x 17 color controller charts for each controller supplied, showing the area covered by the automatic controller.
   c. The chart shall be a reproduction of the as-built system drawing. If the controller sequence is not legible when the drawing is reduced, enlarge it to a size that will be readable when reduced.
   d. Charts shall be a photocopy print or computer plot with a different transparent color used to show area of coverage for each station.
   e. When completed and approved, hermetically seal the chart between two pieces of plastic, each piece being a minimum of 10 mils thick.

7. OPERATION AND MANUALS
   a. Prepare all required and necessary descriptive material in complete detail and sufficient quantity, properly prepared in two individually bound copies. Describe the material installed in sufficient detail to permit qualified maintenance personnel to understand, operate and maintain the equipment. Each manual shall include the following:
      1. Index sheet stating contractor's address and telephone number.
      2. Duration of guarantee period with guarantee forms.

8. SPARE PARTS AND EQUIPMENT
   a. Prepare and deliver to the City's Authorized representative, prior to the start of maintenance, all required spare parts, tools and equipment. Spare parts, tools, and equipment shall include the following per water meter:
      1. Operation and maintenance manuals.
      2. Automatic controller certification letter from Authorized Rainmaster Distributor for each controller installed under this contract.
      3. Two (2) keys for each automatic controller.
      4. One (1) set of special tools required for removing, disassembling and adjusting each type of sprinkler and valve supplied on this project.
      5. A minimum of one (1) five-foot key for operation of gate valves. Provide one (1) key for each type of operating device (2" operating nut, cross handle, etc.).
      6. Two (2) quick coupler keys and matching hose swivel for each type of quick coupling valve installed.
      7. Irrigation controller manuals.
      8. Color-coded controller charts laminated between 2 pieces of 10 mil plastic – Provide two charts for each controller.
      9. "As-built" record drawing mylars of irrigation plans.
      10. Completed Irrigation Guarantee Statement.
      11. Southern California Edison billing information.
      12. Water billing and meter information.

9. QUALIFICATION OF IRRIGATION PERSONNEL
   a. Contractor and on site field superintendent shall have the following minimum qualifications:
      1. Not less than five years continuous experience in installation of commercial irrigation systems.
      2. Demonstrate completion of the manufacturer's installation certification program for the Eagle Plus Rainmaster controller.
      3. Upon City's authorized representative's request, supply a list of references listing successfully completed commercial irrigation systems.

10. GUARANTEE
    a. Submit written guarantee, in approved form, that all work showing defects in materials or workmanship will be repaired or replaced at no cost to the Builder or Developer contracted with the Landscape Contractor for a period of one (1) year from date of acceptance by the Irrigation Consultant.
    b. The guarantee form shall be written onto the Contractor's letterhead and contain the following information. (Shown as an example only)

Guarantee for Irrigation System

555 Maple Sports Field

We hereby guarantee that the irrigation system we have furnished and installed for Tonner Hills, is free from defects in materials and workmanship, and the work has been completed in accordance with the drawings and specifications, ordinary wear and tear and unusual abuse, or neglect expected. We agree to repair or replace any defects in material or workmanship which may develop during the period of one (1) year from date of acceptance and also to repair or replace any damage resulting from the repairing or replacing of such defects at no additional cost to the City. We shall make such repairs or replacements within a reasonable time, as determined by the City, after receipt of written notice. In the event of our failure to make such repairs or replacements within a reasonable time after receipt of such written notice from the City, we authorize them to proceed to have said repairs or replacements made at our expense and we will pay for the costs and charges therefore upon demand.

Project Name: 555 Maple Sports Field Project *Owner: City of Torrance*

Landscape Architect: Land Concern

*Tract Number(s)*_____

*Lot Number(s)*_____

Signed: _____ *Title:* _____

*Date of Signature:*_____

Address:

Telephone:

PRODUCTS

1. GENERAL PIPING
    a. Contractor shall be aware of sources of water for each water meter as they may vary within the same project. Differing sources of water may be treated with colored piping system.
    b. Domestic water pipe (Pressurized mainline and laterals) shall be extruded of an improved P. V. C. virgin pipe compound featuring high impact strength. Confirm to ASTM D-1784 or D-2241 to meet the requirements of cell classification 12454B for pipe. Compound shall have a 2,000 P. S. I. hydrostatic design stress rating. Pipe shall be white in color.

c. Ultra-Violet Resistant (UVR) pipe shall be extruded of an improved PVC virgin pipe compound featuring high impact strength. Confirm to ASTM D-1784 or D-2241 to meet the requirements of cell classification 12454B for pipe. Compound shall have a 2,000 P.S.I. hydrostatic design stress rating.
d. UVR water pipe shall be manufactured using ASTM G-53 testing for accelerated weathering to resist weakening or corrosion by ultra-violet radiation. Pipe shall be brown colored. UVR water pipe shall use Sch. 40 PVC fittings manufactured of the same material or process as the UVR pipe on which they are used.

Type: Pipe: Pacific Plastics, or approved equal.

e. Pipe materials shall be used as follows:

1. Mainlines (pressurized) 1-1/2 inch and smaller downstream of backflow unit: Schedule 40 solvent-weld PVC unless otherwise noted.
2. Mainlines (pressurized) 2 inch through 3 inch downstream of backflow unit: Class 315 solvent-weld PVC unless otherwise noted.
3. Lateral lines: Schedule 40 PVC solvent-weld PVC ¾" and above unless otherwise noted.

2. PLASTIC PIPE FITTINGS
   a. Solvent weld pipe, extruded of an improved PVC virgin pipe compound featuring high impact strength. Confirm to ASTM D-1784 or D-2241 to meet the requirements of cell classification 12454B for pipe. Compound shall have a 2,000 P.S.I. hydrostatic design stress rating.
   b. All pipe and fittings shall bear the following markings: Manufacturer's name, nominal pipe size, schedule or class, pressure rating P.S.I., NSF, and date of extrusion.
   c. Make solvent cement joints for plastic pipe and fittings as prescribed by the manufacturer and shall be low-volitile.
   d. All PVC fittings shall be Schedule 40 PVC and shall be injection molded of an approved PVC fitting compound featuring high tensile strength, high chemical resistance, and high impact strength. Fittings shall conform to ASTM D-1784, and meet the requirements of cell classification 12454B. Where threads are required in plastic fittings, these shall be injection molded also.

      Type: Spears or approved equal.

   e. All threaded nipples shall be standard weight Schedule 80, with molded threads.
   f. Nipples on pressurized mainline shall be Sch. 80 Thread One End (T.O.E.) with the threaded side attached to the FIPT device and the SLIP end attached to the pressure mainline with a SLIP coupling.
   g. Use 3/4 inch size Teflon tape on all threaded ends.

3. COPPER PIPE AND FITTINGS
   a. Copper Pipe shall be Type K, hard tempered, ASTM B88, with fittings of wrought solder joint type in accordance with ANSI B16.22.
   b. Solder joints with silver solder: 45 % silver, 15 % copper, 16 % zinc, 24 % cadmium and solidus as 1125 degrees F. and liquids at 1145 degrees F., conforming to ASTM B206 and FS QQB-655C.

   Type: Fittings: Nibco or approved equal.

4. BRASS PIPE FITTINGS
   a. Brass pipe shall be 85 % red brass, American National Standard Institute (ANSI), Schedule 40 screwed pipe.
   b. Fittings shall be medium brass, screwed, 125 pound class.

5. BACKFLOW PREVENTION UNITS

a. Backflow prevention unit shall be of the brand, size and type indicated on the irrigation plans.
b. Backflow prevention units shall be approved by the Foundation for Cross Connection Control and
c. Hydraulic Research at the University of Southern California.
d. Backflow prevention units shall be the reduced pressure principle (RPP) type.
e. Backflow assemblies shall be installed using brass ells, unions and nipples.
f. Backflow assemblies shall include a 40 mesh bronze wye strainer upstream of the unit.
g. Backflow shall be the same size as the water meter. Where dual manifold meters are utilized, each water meter must have a backflow preventer prior to joining the mainline.

6. BASKET STRAINER
   a. Basket Strainer shall be of the brand, size and type indicated on the irrigation plans.

7. SHUT OFF VALVES
   b. Shut off valves shall be of the brand, size and type indicated on the irrigation plans.

8. QUICK COUPLING VALVES
   a. Quick coupler valves shall be of the brand, size and type indicated on the irrigation plans.
   b. Quick coupling valves shall have a red brass, two-piece body designed for working pressure of 150 P.S.I. with a 1inch FPT bottom inlet.
   c. Quick coupler valve shall have a hinge cover constructed of red brass with a leather like vinyl cover bonded to it in a permanent type of cover.
   d. Quick couplers used with recycled water shall have purple vinyl covers with the appropriate recycled water warnings in English and Spanish, as well as the international "Do Not Drink" symbol and shall have an ACME threaded key.
   e. Quick coupler valve shall be operated only with quick coupler key, designed for that purpose. Quick coupler key is inserted into the valve and a positive, water-tight connection shall be made between coupler key and valve.
   f. Locate all quick coupling valves within 12 - 18 inch of walks, curbs, header boards, or paved areas where applicable. Locate quick coupler valves inside shrub and ground cover areas when ever possible. Quick coupling valves shall be installed such that valve top will be 3 inch below the lid of the valve box.

9. MASTER CONTROL VALVES
   a. Master control valves shall be of the brand, size and type indicated on the irrigation plans.
   b. The master control valve shall be a switchable normally closed 24 VAC solenoid actuated globe pattern, spring loaded diaphragm type. The valve shall be pressure rated up to 200 P.S.I. and shall have a integral schraeder valve test port.
   c. The valve shall have a 600 pound test fabric reinforced rubber diaphragm assembly with self-cleaning stainless steel screen.
   d. The valve shall provide for all internal parts to be removable from the top without disturbing the valve installation.

10. FLOW SENSOR
   a. An irrigation main-line flow sensor shall be installed in accord with Drawings. See Drawings for location. Contractor shall be responsible for the installation, hook-ups, materials, components, connections, etc., of the flow sensors for the complete automatic operation of the system.
   b. The flow sensor shall be manufactured by Data Industrial Company. Install as recommended by the manufacturer and as detailed.
   c. Use Data Industrial 220B brass tee mounted flow sensor for sizes 1" through 1-1/4"
   d. Use Data Industrial IR-220P plastic tee mounted flow sensor for sizes 1-1/2" through 4" as noted on the drawings.
   e. All splices shall be performed in a dry splice type connected with an empty tube and gel pack tube of sealant.

11. FLOW SENSOR INTERCONNECT

a. Flow sensor cable shall be of the brand, size and type indicated on the irrigation plans.
b. Flow sensor wire may be extended to a maximum distance of 2000 ft. from the location of the assembly to which it is connected. Wire shall be installed in a 1-1/4 in. UL-listed Schedule 40 conduit.
c. Provide a separate flow sensor cable from each flow sensor to its respective designated controller.

12. REMOTE CONTROL VALVES
a. Remote control valves shall be of the brand, size and type indicated on the irrigation plans.
b. The remote control valve shall be normally closed 24 VAC solenoid actuated globe pattern, spring loaded diaphragm type.
c. The valve shall be pressure rated up to 200 P.S.I.
d. The valve shall have a 600 pound test fabric reinforced rubber diaphragm assembly with self-cleaning stainless steel screen.
e. The body and bonnet shall be plastic and the valve shall have a stainless steel control / shut-off stem and manual operator.
f. The valve shall provide for all internal parts to be removable from the top without disturbing the valve installation.
g. Install valves in planting areas and according to the construction details. Only one valve per box will be allowed.
h. Align valve boxes at right angles to adjacent hardscape whenever possible. Where several valve boxes are located in the same area, arrange them in a uniform and orderly fashion.
i. When grouped together, allow a minimum of 12 inches between valves. The valves shall be installed in valve boxes which will have enough room on all sides of the valves to allow repair personnel to completely reconstruct the valves without removing the valve box.

13. CONTROLLER SATELLITES
a. All materials furnished and installed shall be new and shall conform to manufacturer's installation instructions and these specifications.
b. Controllers shall be of the brand, size and type indicated on the irrigation plans.
c. The controller shall be installed in a stainless steel controller assembly as manufactured by John Deere Green Tech who shall provide the City with a written 5 year Limited Warranty on each complete assembly and a "Certificate of Compliance" certifying that each assembly has been properly installed on the project site.
d. All irrigation controller and accessory project, as specified, shall be installed in Strongbox top mount stainless steel enclosures.
e. The controller assembly shall be of a vandal resistant and weather resistant nature manufactured entirely of 304 grade stainless steel.
f. The main housing door shall be louvered at the bottom and equipped with a tear drop shaped, hollow center thermoplastic door seal.
g. Filter screen shall cover all louvers to deflect against water spray, insects and dust.
h. The above described product shall be a NEMA 3R Rainproof Enclosure as listed by Underwriter Laboratories, Inc.

14. LOW VOLTAGE CONTROL WIRING
a. Connections between the controller and remote control valves shall be made with direct burial UF type wire, installed in accordance with valve manufacturer's wire chart and specifications.
b. b. Wire shall be soft drawn bare copper meeting the requirements of ASTM specification B-3 or B-8 10°C +60°C.
c. Wire shield shall be Polyvinyl chloride, 60°C rated conforming to UL Standards 493 and 83.
d. Shield shall be surface marked with Paige-Electric, voltage rating, size and type, and UL file number
e. All cables shall be tested physically and electrically in accordance with UL Standard 493, and 83 (paragrahs 28.1, 29.1 and 29.2). All reels and cartons shall bear UL labels
f. Wiring shall be installed adjacent to the mainline whenever possible and shall never be installed above or below the pipe.

g. Where more than one wire is placed in a trench, the wiring shall be taped together using black electrical tape at intervals of 10 feet.

Type: Paige 7001-D

h. All splices shall be made using sealed waterproof connectors.
i. An expansion curl shall be provided at all directional changes. Expansion curls shall be sufficient length at each splice connection at each electric control valve, so that in case of repair, the valve bonnet may be brought to the surface without disconnecting the control wires.
j. Control wires shall be laid loosely in the trench without stress or stretching of control wire conductors. A two (2) foot expansion loop shall be located every 100 feet on continuous wire runs.
k. Sizing of the lead wire shall be in accordance with irrigation drawings and manufacturer's recommendations, in no case shall the thickness of the wire be less than #14 AWG.
l. All leads wires to be #14 AWG
m. All common wire shall be #14 AWG.
n. Use continuous wire between controller and remote control valves. Under no circumstances shall splices exist without prior approval. Any splices allowed shall be installed in a labeled pull box.
o. All control wires shall be uniform in color. When more than one controller is installed use a different color wire for each controller.
p. All common wires and only common wires shall be white in color. When more than one controller is installed use white colored wire with a different color stripe for each controller. Green color shall not be used except for ground wire. Color of the stripe shall match the color of the control wire.

15. WIRE SPLICES
a. Conductors shall be installed with no underground splices, unless absolutely necessary and unavoidable. Any and all underground splices that are required to be made, must be approved by the Irrigation Consultant, and shall be placed in a suitable type valve box for easy access.
b. All wire splice boxes shall be noted on the irrigation as-built drawings.

16. VALVE BOXES
a. Valve boxes shall be used as durable, rigid enclosures for valves or other irrigation system components requiring subsurface protection for installation or maintenance.
b. The valve box shall be made of structural foam HDPE resin that is resistant to UV light, weather, moisture, and chemical action of soils.
c. The standard rectangular body shall have knock-outs molded into the sides that can be readily removed. The knock-outs shall remain an integral part of the body unless removed to run pipes or wires through the valve box.
d. The valve box shall have corrugated sides.
e. Rectangular valve boxes shall have a grooved feature on one side, just below the lid at the top of the box, for inserting a shovel blade or other prying tool to provide easy lid removal. This is useful following compaction of the surrounding soil or after the eventual accumulation of thatch over the valve box.
f. There shall be no hole in the valve box lid unless the bolt-hole knock-out is removed in order to use the locking bolt. Lids shall have beveled edges to minimize potential damage from lawn equipment.
g. Lids shall be clearly marked with the words “Irrigation Control Valve” molded onto the top. Lids
h. shall have a marking area measuring at least 6" by 2" that is suitable for branding or other means of identification.
i. The locking bolt, washer, and clip shall be made of stainless steel.
j. Valve box types and sizes shall be furnished and installed per the irrigation legends and details.
k. Valve boxes and covers shall be green in color.
l. Identification letters or numbers shall be 2 inch high and heat branded onto the box cover. Identification shall be as indicated on the detail drawings.
m. Heat branding shall be accomplished using branding irons specifically designed for this purpose. Heat branding shall not weaken or in any way puncture the valve box cover.

17. SPRINKLER HEADS
    a. Full circle, part circle pressure regulating spray heads and built-in check valve sprinkler heads:
        1. The sprinkler body, stem nozzle and screen shall be constructed of heavy duty plastic.
        2. The sealing device shall create no more that one (1) PSI pressure drop at maximum rated pressure and flow.
        3. The sprinkler shall have a strong stainless steel retract spring for positive pop-down. Pop-up height shall be as indicated on the irrigation drawings and no less than 6 inches.
        4. The sprinkler shall have a screen under the nozzle to protect it from clogging and for easy removal for cleaning and flushing system.
        5. The sprinkler shall be equipped with a built in pressure regulating device capable of regulating an inlet pressure of 35 - 70 PSI to 30 PSI for proper operation of the spray head. The pressure regulating device shall be constructed of stainless steel springs and heavy duty plastic parts.
        6. Pop-up sprinklers shall be equipped with a built in anti-drain valve capable of holding water within the sprinkler head from up to 8 feet of elevation change. The check valve equipped pop-up sprinkler shall be identified on the cap as being so equipped.
        7. The sprinkler shall have a matched precipitation rate (MPR) plastic nozzle with an adjusting screw capable of regulating the radius and flow.
        8. MPR nozzles - The plastic nozzles shall have matched precipitation rates across sets (8 feet, 10 feet, 12 feet, 15 feet). The spray nozzles shall have female thread configuration for use on the 1800 series sprinkler and the PA-8S plastic shrub adapter.
        9. Rotary Nozzles shall have multiple arced streams and have a matched precipitation rate of 0.60 in/hr. The Rotary Nozzle shall be constructed of UV-resistant plastic. The radius adjustment screw shall be of stainless steel.
        10. The Rotary Nozzles shall include a removable .02 x .02 mesh screen to protect the nozzle against clogging. The Rotary Nozzle shall have a precipitation rate matched with Rain Bird 5000/5000 PlusMPR Rotor Nozzles.

18. SUBSURFACE INLINE DRIP IRRIGATION TUBING

    a. Drip tubing shall have the following component specifications:
        1. Nominal sized to 17mm (one-half inch) low density, ultra-violet-resistant, linear polyethylene tubing with internal pressure-compensating, self-cleaning, integral drippers spaced at 12 inches.
        2. The low volume tubing shall be capable of a discharge rate of 0.60 gallons per hour (GPH) between operating pressures of 7 to 70 psi for each individual dripper.
        3. The individual self-cleaning, pressure-compensating drippers shall be welded to the inside of the tubing wall.
        4. All inline drip tubing shall be Netafim Techline RW.
        5. All drip tubing shall be buried 5 inch below finish grade and stapled in the trench at four feet on center with drip tubing stakes.
        6. Maximum radius for tubing bends shall be 3 feet or greater. Smaller bends or immediate changes in direction in drip tubing shall only be made with insert barb fittings. A tubing stake shall be use at each barbed fitting for changes in direction.
        7. Maximum flow for inline drip irrigation systems is 12 gallons per minute.
        8. Netafim Techline RW shall be installed with Netafim TLAVRV air/vacuum relief valves at the high point of each drip irrigation zone to expel air during pressurization and draw air during valve closing.

    b. All insert barbed fittings shall be constructed of molded, ultra-violet-resistant, brown colored plastic having a nominal inside dimension (I.D.) of 0.57" (17 mm). Each fitting shall have a minimum of two ridges or barbs per outlet. All inline drip tubing fittings shall be Netafim.

    c. Non-pressure supply and exhaust headers shall be rigid polyvinyl chloride PVC 1220, (Type 1, Grade 2), Schedule 40 PVC with Schedule 40 PVC fittings.

d. Drip filtration unit shall include a Pressure Regulating Quick Check Basket Filter that combines filtration and pressure regulation in one integrated unit for protection of downstream components of drip irrigation system. Pressure regulating basket filter shall be Rainbird PRF-QKCHK-140 mesh with component specifications to include:

    1. Basket style body and jar-top cap constructed of heavy-duty glass-filled, UV-resistant polypropylene, with 150 PSI operating pressure rating.
    2. Indicator incorporated into filter cap that changes color from green to red during operation when the filter element requires cleaning.
    3. Standard 200 mesh filter screen constructed of stainless steel attached to propylene frame. Screen is serviceable for cleaning purposes by unscrewing cap from filter body and removing filter element.
    4. Normally-open in-line pressure regulating device, constructed of durable, UV resistant non-corrosive material able to accommodate an inlet pressure rating of not less than 150 PSI, with preset outlet pressure of approximately 40 PSI. Pressure regulating device allows full flow with minimal pressure loss unless inlet pressure is greater than preset level. As inlet pressure increases above preset level, internal spring compresses to reduce downstream pressure.
    5. Male threaded 1" inlet and outlet connections.

e. All inline drip tubing systems shall have a Schedule 40 PVC ball type manual flush valve at each isolated zone within the system to allow water to be drawn through all the tubing during flush operation. Multiple flush valves may be necessary per drip valve zone, refer to plan for locations.

19. CHECK VALVES
    a. Provide check valves and/or anti-drain valves as may be required by the Irrigation Consultant to prevent drainage of irrigation water from sprinkler system due to changes in elevation.
    b. Anti-drain valves shall be of heavy duty virgin PVC construction with F.I.P. thread inlet and outlet. Internal parts shall be stainless steel and neoprene. Anti-drain valve shall be field adjustable against drawout from 4 to 32 feet of head.

    Types: Hunter HCV or approved equal

20. MISCELLANEOUS EQUIPMENT
    a. Thrust Blocks: Thrust blocking shall be used on all gasketed type mainline. Thrust blocks shall be minimum 1 cubic foot of 470-C-2000 type 5 concrete. All PVC pipe fittings shall be wrapped with black plastic tape prior to installation of thrust blocks.
    b. Gravel: All gravel used in valve boxes shall be washed crushed gravel of approximately 3/4 inch size. No pea gravel shall be used.
    c. Identification tags with numbers are required on all valves.

    Type: Christy Tags (yellow background with black lettering)

    d. Swing Joint Assemblies: All sprinklers shall be installed with triple swing joints. Assembly shall be sized per the sprinkler inlet, with a 6 inch minimum lay length. 1/2" swing joints shall be made with marlex street ells. 3/4" and larger swing joints shall be made with Sch. 40 PVC street ells.

EXECUTION

1. INSPECTION SCHEDULE
    a. Contractor is responsible for notifying the Irrigation Consultant 48 hours in advance for on-site meetings and observations.

b. As-built drawings must be submitted to the Irrigation Consultant for approval prior to site inspection; no inspection will commence without as-built drawing approval.
c. When performing the irrigation coverage test, the contractor shall be responsible for having a two-way communication system or sufficient personnel, so that the directions from the inspection area to the controller of the system can be readily accomplished.

2. WATER SUPPLY
   a. Utilize water meter and provide connections to backflow prevention unit per the irrigation drawings and details.
   b. Connections to the existing water meter shall be at the approximate locations shown on the drawings. Minor changes caused by actual site conditions shall be made without additional cost to the City.
   c. Any R.P. backflow prevention unit shall be tested by a certified backflow prevention technician and its operation certified in writing. Landscape Contractor is to arrange and pay for all testing and certification fees. The original written certification of the backflow prevention unit is to be submitted to the Irrigation Consultant.

3. LAYOUT
   a. Lay out irrigation heads and make any minor adjustments required due to differences between site and the drawings. Any such deviations in layout shall be within the intent of the original drawings and approved by the Irrigation Consultant.
   b. Lay out all irrigation equipment using an approved staking method, and maintain the staking of approved layout.
   c. All layouts in deviation of the design intent shall be approved by the Irrigation Consultant prior to equipment installation.
   d. Before starting work on irrigation system, determine that work may proceed without disruption of activities of other trades.
   e. The contractor shall carefully check grades to ensure that the area is safe to begin work.
   f. Contractor is responsible for taking all reasonable investigative actions and precautions, when working around any utility system. Underground Service Alert shall be utilized where possible.
   g. Contractor shall be responsible for verification of site conditions and minor revisions as approved by the Irrigation Consultant to insure 100% irrigation coverage in all areas.

4. ASSEMBLIES
   a. Routing of irrigation lines as indicated on drawings is diagrammatic. Install lines (and various assemblies) to conform to details on plans. Whenever possible, place all irrigation gate valves, remote control valves, quick couplers, pull boxes, etc. in the shrub planting areas. Irrigation elements drawn in hardscape areas on the plans are for graphic clarity only and intended to be placed in shrub planting areas.
   b. Do not install multiple assemblies on plastic lines. Provide each assembly with its own outlet.
   c. Install all assemblies specified herein according to the respective detail drawings or specifications, using the best standard practices with prior approval.
   d. Assemble brass pipe / fittings and plastic pipe / threaded fittings, using Teflon tape applied to the male threads only.
   e. Install concrete thrust blocking per detail on all mainline with gasketed pipe.

5. LINE CLEARANCE
   a. All lines shall have a minimum clearance of 4 inches from each other and 24 inches from lines of other trades.
   b. Do not install parallel lines directly over one another.

6. TRENCHING

a. Dig trenches and support pipe continuously on bottom of trench. Lay pipe to an even grade. Pipe shall be snaked from side to side to allow for expansion and contraction. Trenching excavation shall follow layout indicated and as noted.
b. Refer to details for trenching and pipe installation under paving dimensions.

7. BACKFILLING
   a. Initial backfill on all lines shall be of a fine granular material, not larger than 1/2 inch diameter.
   b. Compact backfill to dry density equal to 95% compaction, conforming to adjacent grades without dips, sunken areas, humps, or other irregularities.
   c. In appropriate types of soil, the Irrigation Consultant may authorize the use of flooding in lieu of tamping.
   d. Under no circumstances shall vehicle wheels be used for compacting soil.
   e. Provide sand backfill a minimum of 4 inches over and under all piping under paved areas, and a minimum of 2 inches on all other piping.
   f. If settlement occurs and subsequent adjustments in pipe, valves, irrigation heads, turf or other plantings, or other construction are necessary, the contractor shall make all required adjustments without cost to the City.

8. FLUSHING THE SYSTEM
   a. After all irrigation pipe lines and risers are in place and connected, and prior to installation of irrigation heads, the control valves shall be opened and a full head of water used to flush out the system.
   b. Sprinkler heads shall be installed only after flushing of the system has been accomplished to the complete satisfaction of the Irrigation Consultant.

9. UNDER EXISTING AND/OR PROPOSED PAVEMENT:
   a. Trenches located under areas where paving, asphaltic concrete or concrete will be installed shall be backfilled with sand and compacted in layers to 95 % compaction, using manual or mechanical tamping devices. Trenches for piping shall be compacted to equal the compaction of the existing adjacent undisturbed soil and shall be left in flush with the adjoining grade. The irrigation contractor shall set in place, cap and pressure test all piping under paving prior to paving work.
   b. Piping under existing pavement may be installed by jacking, boring, or hydraulic driving. However, no hydraulic driving will be permitted under asphalt paving.
   c. Provide a minimum cover of 18 inches between the top of the pipe and the bottom non-pressure piping (laterals) installed under asphaltic concrete paving.
   d. Sleeves shall be two times the diameter of lateral line, mainline, and wire bundle size, and a minimum of 2 inch size. Install separate sleeves for each use.
   e. Under public roads, all mainlines and lateral piping must have a minimum cover of 36 inches from the top of the pipe to the bottom of aggregate base or per local code.
   f. Secure permission from the Irrigation Consultant before cutting or breaking existing pavement. All necessary repairs and replacements shall be approved by the Irrigation Consultant and City's authorized representative at no additional cost to the City.

10. CONTROLLER
    a. The contractor shall install a new controller as specified on the irrigation drawings.
    b. Controller shall be installed in the locations indicated on the irrigation drawings and approved by the Irrigation Consultant.
    c. Contractor shall install separate sleeve conduits for phone line, control wiring, ground wire and electrical power wires as required.
    d. Controller shall be installed in shrub areas only.
    e. Install controller per local electrical code.

11. IRRIGATION HEADS
    a. Install irrigation heads as indicated on the irrigation drawings.

b. Spacing of heads shall not exceed the maximum indicated. In no case shall the spacing exceed the maximum recommended by the manufacturer.
c. Heads along curbs, walks, paving, etc., shall be placed 1/2 inch above finish grade.
d. Final sprinkler head heights shall be as indicated on the irrigation detail drawings. All sprinkler heads installed adjacent to hardscape features shall be located min. 4 inches off the edge of the hardscape feature for turf and 6 inches for shrub heads.
e. All irrigation heads shall be set perpendicular to finish grades unless otherwise indicated on the plans.

12. ADJUSTING THE SYSTEM
    a. The contractor shall flush and adjust all irrigation heads and valves for optimum performance and to eliminate over spray onto walks, roadways, buildings, walls and other structures.
    b. If it is determined that adjustments in the irrigation equipment or nozzle changes will provide proper and more adequate coverage, make all such changes or make arrangements with the manufacturer and Irrigation Consultant to have adjustments made, prior to any planting.

13. COVERAGE TEST
    a. When the irrigation system is completed, perform a coverage test in the presence of the Irrigation Consultant to determine if the water coverage for turf, planting and slope areas is complete and adequate.
    b. Coverage must be 100 % head-to-head and accepted by the Irrigation Consultant. Furnish all materials and perform all work required to correct any inadequacies of coverage due to deviations from the plans or where the system has been willfully installed as indicated in the drawings, when it is obviously inadequate or inappropriate, without bringing this to the attention of the Irrigation Consultant. This test shall be accomplished before any plant material is planted (excluding trees).

14. TESTS
    a. All piping under paved areas shall be tested under a hydrostatic pressure of 150 PSI and approved watertight, prior to the paving operation. Make hydrostatic tests only in the presence of the Irrigation Consultant and Water District Inspector. No pipe shall be backfilled until it has been inspected, tested, and approved in writing. Allow 48 hours lead time for pressure testing inspections.
    b. Furnish necessary force pump and all other test equipment.
    c. Test all pressure mainlines under a hydrostatic pressure of 150 PSI for a period of four hours.
    d. All testing shall be approved prior to the installation of remote control valves, quick couplers, or other valve assemblies.

15. MAINTENANCE
    a. The entire irrigation system shall be under full automatic operation for a period of seven days prior to any planting or hydroseeding (excluding trees).

16. COMPLETION CLEANING:
    a. Upon completion of the work, make ground surface-level, remove excess materials, rubbish, debris, etc., and remove construction and installation equipment from the premises.

END OF SECTION

SECTION 02870
SITE FURNISHINGS

PART 1 – QUICK CRETE

1.1 SUMMARY

A. Provide:
   1. (QR30SP) 30" Diameter SRC Sphere Bollards with anchor bolt attachment method.

   2. QR8BR) 8" Diameter by 30" High Litecrete (GFRC) Removable Bollards with two piece galvanized steel anchoring attachments with locking hasp. Bollard to not exceed 75 pounds with steel plate and pipe.

   3. All dimensions, features (reveals, details) and radii to be within a ¼' tolerance from specified product.

1.2 REFERENCES

A. Architectural Precast Association (APA).

B. ASTM

1.3 SUBMITTALS

A. Product Data: Submit product data for manufactured materials and products.

B. Shop Drawing

   1. Show in-place location, fabrication details, plans, elevations, anchorages, reinforcement, connection details and methods, dimensions, finishes, relationships to adjacent materials, and erection and placement.

C. Samples: Nominal size 6" sq. by appropriate thickness, of each type of unit and finished facing shown and specified for approval of quality, color, and texture of surface finish. Submit prior to fabrication.

D. Mix Design(s): Proposed concrete mix design for each type and color of concrete mix.

E. Test Reports: Compressive Strength. Supply 12 test results from the last year showing the required results of 5000 PSI.

1.4 QUALITY ASSURANCE

A. Fabricator's Qualifications: Firm shall have a minimum of five (5) years experience in producing units similar to those required for this Project, with sufficient production capacity to produce and deliver required units without causing delay in Work.

   1. Fabricating plant shall be a member of one of the following:
      a) Architectural Precast Association (APA).
      b) Precast/Prestressed Concrete Institute (PCI), Group A1.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver units to the Project site in such quantities and at such times to ensure continuity of installation.

B. Deliver on a truck owned by the manufacturer. Truck to have a crane or a forklift for placement. Driver to be trained to use applicable equipment. Placement where possible. Contractor to place product not reachable by manufacturer's equipment.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Approved Fabricators:
   1. Quick Crete Products Corp. P.O. Box 639 Norco, CA 92860. (909)737-6240 (main office), (909) 737-7032 (fax) www.quickcrete.com
   2. Fabricators not listed as approved shall request approval. Approval request must be sent to the owner 30 days before bid opening. Request must include drawings, color samples, and an actual product for review by owner. Approved Fabricator must be able to produce 20 units a week within 2 weeks of receiving a purchase order. Approved Fabricator must ship on company owned trucks equipped with a crane or forklift for off-loading product.

2.2 MATERIALS

A. Concrete Materials:
   1. Portland Cement: ASTM C 150, Type I(white) or III (gray), to achieve desired finish colors. Use only one brand, type, and color from the same mill.
   2. Aggregates: ASTM C 33, gradation may differ to achieve desired finish characteristics. Select coarse and fine aggregate colors and screen sizes to match approved sample(s). Verify that adequate supply, from one pit or quarry, for each type of aggregate is available for the entire Project. If possible obtain entire aggregate supply prior to starting Work, or have aggregate supply held in reserve by aggregate supplier.
   3. Water: Potable. Clean, clear, and free from deleterious amounts of salts, acids, alkali's, organic materials, oils, detergents, or other matter that may interfere with color, curing, or strength of concrete.
   4. Admixtures: Select to be compatible in specified mix.
      a) Air Entraining: ASTM C 260.
      b) Water Reducing: ASTM C 494, Type A,B,C,F. or G.
      c) Coloring Agent: ASTM C 979, compatible with other concrete materials.

B. Formwork:
   1. Provide forms with acceptable form facing materials that are non-reactive with concrete or form release agents and will produce required finish surfaces.
   2. Construct and maintain forms to produce precast concrete units of shapes, lines, and dimensions indicated, within specified tolerances.

C. Reinforcing Materials:
   1. Reinforcing Bars: ASTM A 615, Grade 40

2.3 MIXES

A. Design mixes for each type of concrete specified may be prepared by an independent testing agency or by architectural precast manufacturing plant personnel at precast fabricator's option.

B. Proportion mixes by either testing agency trial batch or field test data methods in accordance with ACI 211.1, using materials to be used on the project, to provide normal weight concrete with properties as follows:

   1. Compressive Strength: 5,000 psi when tested in accordance with ASTM C 39.

2. Maximum water cement ratio 0.47 at point of placement.
3. Add air-entrainment admixture to result in air content at point of placement complying with ACI 533 requirements.
4. List other admixtures and recommended quantities.

2.4 FABRICATION

A. General:
   1. Fabricate precast concrete units with manufacturing and testing procedures, quality control recommendations, and dimensional tolerances as specified in ACI 533, unless more stringent requirements are shown or specified.
   2. Fabricate units straight, smooth and true to size and shape, with exposed edges and corners precise and square, unless otherwise indicated.

B. Reinforcement: Comply with CRSI "Manual of Standard Practice" and ACI 318 recommendations. Reinforce architectural precast concrete units to resist handling, transportation stresses, and to comply with specified performance criteria.

C. Comply with ACI-533 requirements for measuring, mixing, transporting, and placing concrete.

D. Consolidate concrete using equipment and procedures complying with ACI 533.

E. Discard units that are warped, cracked, broken, spalled, stained, or otherwise defective unless repairs are approved by the Owner and meet specified requirements.

F. Fabrication Tolerances: Fabricate to tolerances listed in ACI-533.

2.5 FINISHES

A. Finish exposed surfaces or units to match Owner's reference sample:

   1. Color and Texture to be selected by the Landscape Architect.
   2. Surface finish free from pockets, sand streaks, honeycomb, with uniform color and texture. Bugholes less than 1/4 inch in diameter are acceptable only on heavier blasted finishes. Bugholes not acceptable on smooth, light sandblast or acid etch finishes.

B. Seam lines to be stoned neatly to minimize appearance. Products with wide seam lines could be subject to rejection.

2.6 SEALERS

A. All surfaces to be sealed with three coats of a water based acrylic sealer, which has graffiti-resistant qualities. Must be non-sacrificial so most graffiti can be cleaned with lacquer thinner and not require resealing.

2.7 SOURCE QUALITY CONTROL

A. Inspect and test architectural precast concrete in accordance with ACI 533.

B. Defective Work: Discard units that do not conform to requirements as shown or specified. Replace with units which meet requirements.

2.8 GUARANTEE

A. Fabricator to provide a one-year guarantee against manufacture's defect

PART 1 - BENCH SPECIFICATIONS

1.1 DESCRIPTION
A. Section includes information, materials, and options for products manufactured by Victor Stanley, Inc. All specifications are subject to change. Contact manufacturer for details.

1.2 SUBMITTALS
A. Specifications Drawing: Detail drawing of product including overall dimensions and options.
B. Samples: Various component samples available upon request.
C. Qualifications: Installer must submit evidence of a successful installation history with comparable materials and designs specified.

1.3 DELIVERY, STORAGE, and HANDLING
A. Delivery: Deliver products to site in manufacturer's original, unopened containers and packaging. Upon delivery, examine packages immediately to ensure all products are complete and undamaged.
B. Storage: Store products in a protected, dry area in manufacturer's unopened containers and packaging.
C. Handling: Protect product's finish from damage during handling and installation.

1.4 COORDINATION
A. Coordinate with site work and other appropriate sections of the specifications to maintain proper provisions of the work specified.
B. All site furnishings shall be laid out in the field and approved prior to installation.

PART 2 PRODUCTS

2.1 MANUFACTURER

A.Victor Stanley, Inc.
P.O. Drawer 330
Dunkirk, MD 20754 USA
Toll Free: (800) 368-2573 (USA & Canada)
Tel: (301) 855-8300 Fax: (410) 257-7579
E-mail: *sales@victorstanley.com*
Web site: http://www.victorstanley.com

2.2 BENCH
A. Type: Model FBF-50 from the Street Sites Series ™
B. Patents Pending.

2.3 MATERIALS
A. 1/4" x 1-1/2" (6.35mm x 38.1mm) horizontal solid steel slats 3/8" x 1 (9.53mm x 25.4mm) solid steel bracing; 1-7/8" (47.63mm) tubular steel cross-members

2.4 OPTIONS
A. Standard lengths: 4ft (1.2 meters), 6ft (1.8 meters), & 8ft (2.4 meters) (custom lengths available)
B. Armrest(s)
C. Mounting: Standard in-ground or surface.
D. Standard Colors: VS Bronze, VS Black, VS Green, VS Tavern Square Green, VS Teal,VS Blue, VS Burgundy, VS Red, VS White, VS Gray (custom colors available, including RAL range, at a small additional cost)

2.5 FINISHES

A. All fabricated metal components are steel shotblasted, etched, phosphatized, preheated, and electrostatically powder-coated with TGIC polyester powder coatings. Products are fully cleaned and pretreated, preheated and coated while hot to fill crevices and build coating film. Coated parts are fully cured to coating manufacturer's specifications. The thickness of the resulting finish coat averages 8-10 mils (200-250 microns).
B. In high salt abusive climates, hot dip galvanizing before powder coating is available. Hot dip galvanizing will provide greater protection in salty climates but yields a slightly less smooth coating finish. Most fabricated metal components and castings can be hot dip galvanized, lids cannot, please contact manufacturer for details.

PART 3 EXECUTION

3.1 INSTALLATION

A. Standard in-ground: It is not recommended to locate footing(s) until bench is in place.
This Victor Stanley, Inc product must be permanently affixed in the ground.
Consult your local codes for regulations.
B. Standard surface: Clearance for 3/8" (9.53mm) anchor bolts (anchor bolts not provided by Victor Stanley, Inc.) It is not recommended to locate anchor bolts until bench is in place. This Victor Stanley, Inc. product must be permanently affixed to the ground. Consult your local codes for regulations.

3.2 PROTECTION

A. Protect products prior to installation by having them remain in the manufacturer's packaging and container.

1.1 PART 1 GENERAL Model: DYN-36, TRASH RECEPTACLES

1.1 DESCRIPTION

A. Section includes information, materials, and options for products manufactured by Victor Stanley, Inc. All specifications are subject to change. Contact manufacturer for details.

1.2 SUBMITTALS

A. Specifications Drawing: Detail drawing of product including overall dimensions and options.
B. Samples: Various component samples available upon request.
C. Qualifications: Installer must submit evidence of a successful installation history with comparable materials and designs specified.

1.3 DELIVERY, STORAGE, and HANDLING

A. Delivery: Deliver products to site in manufacturer's original, unopened containers and packaging. Upon delivery, examine packages immediately to ensure all products are complete and undamaged.
B. Storage: Store products in a protected, dry area in manufacturer's unopened containers and packaging.
C. Handling: Protect product's finish from damage during handling and installation.

1.4 COORDINATION

A. Coordinate with site work and other appropriate sections of the specifications to maintain proper provisions of the work specified.
B. All site furnishings shall be laid out in the field and approved prior to installation.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Victor Stanley, Inc.
P.O. Drawer 330
Dunkirk, MD 20754 USA

Toll Free: (800) 368-2573 (USA & Canada)
Tel: (301) 855-8300 Fax: (410) 257-7579
E-mail: sales@victorstanley.com
Web site: http://www.victorstanley.com

2.2 LITTER RECEPTACLE

A. Type: Model DYN -36 from the Dynasty Series™
B. Patents pending

MATERIALS

A. 1/4" x 1-1/2" (6.35mm x 38.1mm) vertical solid steel bars; 1/4" x 2-1/2" (6.35mm x 63.5mm) solid steel top band; 1/4" x 2" (6.35mm x 50.8mm) solid steel support bars; leveling feet with a 3/8" (9.53mm) diameter threaded steel shaft
B. 36-gallon (136 liter) capacity high density plastic liner [weight not to exceed 6 lbs. (2.72 kg)]
    a. Victor Stanley, Inc., plastic inner liners are molded on tooling designed for and owned by Victor Stanley, Inc. They offer maximum capacity and strength with lightweight construction using critical molded ribs, integral handholds, and high strength materials. This minimizes handling difficulty and facilitates easy emptying and storage while affording long service life.

2.3 OPTIONS

A. Lids: Shipped with standard tapered formed lid; available with optional S-2A formed dome, S-2A formed dome with stainless steel ashtray, S-3 formed dome, S-3 formed dome with stainless steel ashtray, and DS-32 formed dome with self-closing door
B. Standard colors: VS Bronze, VS Black, VS Green, VS Tavern Square Green, VS Teal, VS Blue, VS Burgundy, VS Red, VS White, VS Gray, VS Silver (custom colors available, including the RAL range, at a small additional cost)
C. Custom plaques and decals: Steel plaques in various sizes and pressure sensitive vinyl outdoor decals.

2.4 FINISHES

A. All fabricated metal components are steel shotblasted, etched, phosphatized, preheated, and electrostatically powder-coated with TGIC polyester powder coatings. Products are fully cleaned and pretreated, preheated and coated while hot to fill crevices and build coating film. Coated parts are fully cured to coating manufacturer's specifications. The thickness of the resulting finish averages 8-10 mils (200-250 microns).
B. In high salt abusive climates, hot dip galvanizing before powder coating is available. Hot dip galvanizing will provide greater protection in salty climates but yields a slightly less smooth coating finish. Most fabricated metal components and castings can be hot dip galvanized, lids cannot, please contact manufacturer for details.

PART 3 EXECUTION

3.1 INSTALLATION

A. 3/4" (19.05mm) square anchor bolt hole (anchor bolt not provided by Victor Stanley, Inc.)B.Mounting: It is not recommended to locate anchor bolts until receptacle is in place. This Victor Stanley Inc. product must be permanently affixed to the ground. Consult your local codes for regulations.

3.2 PROTECTION

A. Protect products prior to installation by having them remain in the manufacturer's packaging and container.

END OF SECTION

SECTION 02900 - EXTERIOR PLANTINGS

PART 1 - GENERAL

1.1 SUMMARY

A. General: Provide Exterior Plantings in accordance with Contract Documents 1. Drawings and general provisions of the Contract Documents, including General Conditions and Divisions 1 Specification Sections, apply to this Section.

B. Related Work Specified Elsewhere:

1. Grading - Refer to Drawings.
2. Section 02810 - Irrigation System

C. Summary of Work: This Section includes the following:

1. Contractor shall furnish all labor, material, equipment, and services necessary to install all landscape planting as indicated on the approved plans and as specified herein, and shall perform all other incidental work necessary to accomplish the intent of this specification and the approved plans including the following:

a. Trees, Shrubs, Vines, Ornamental Grasses, and Herbaceous Plants
b. Fertilizers, and Mulches
c. Staking, guying, tying, and trunk guards
d. Pest and disease control
e. Maintenance under contract and guarantee

2. Installation of Owner-Furnished Trees: Contractor's responsibilities include, but are not limited to, the following:

a. Review of plant material at grower and that the contractor will accept the plant material when trees are off loaded at site.
b. Delivery Schedule.
c. Shipping Cost.
d. Off Loading
e. Receivership at off loading.
f. Acceptable holding/storage yard with water and adequate protection (shade).
g. Planting.
h. Maintenance.
i. Warranty as described in specifications.

1.2 REFERENCES

A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations of the following:

1. ANSI Z60.1 "American Standard for Nursery Stock"

B. Where the language in any of the documents referred to herein is in the form of a recommendation or suggestion, such recommendation or suggestion shall be deemed to be mandatory under this Contract.

1.3 SUBMITTALS

A. General: Submit each item in this Article according to the Condition of the Contract and Division 1 Specified Sections.

1. Product Data for each type of product indicated.
2. Label Data substantiating that planting material comply with specified requirements.
3. Schedule indicating anticipated dates and locations for each type of planting. This schedule shall be submitted within 3 calendar days after Contract Notice to Proceed. Include in this schedule anticipated dates from commencement and sequencing of planting operations, including but not limited to selections and tagging, layouts and layout approval, placement of tree, and commencement of maintenance period.
4. Plant Submittals Shall Include: Submittal sources and photographs of actual trees and all other plant materials to be used on the project for review and approval by Landscape Architect.
5. Mulch: Submittal of 3 pound bag of material for approval by Landscape Architect.
6. Planting Soil: Submittal of 3 pound bag of each type of material specified for approval by Landscape Architect.

B. Material Certificates: Chain-of-custody certificates certifying that wood products comply with forest certification requirements. Include evidence that manufacturer is certified for chain of custody by an FSC-accredited certification body.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who has completed landscaping work similar in material, design, and extent to that indicated for this Project and with a record of successful landscape establishment.

B. Installer's Field Supervision: Require installer to maintain an experienced fulltime supervisor on the Project Site during times landscaping is in progress. Supervisor shall not be changed, except with consent of the Landscape Architect. Supervisor shall represent contractor in contractor's absence, and all direction given to supervisor shall be as binding as given to Contactor.

C. Nursery Stock Standards: Provide quality, size, genus, species, and variety of trees indicated, complying with applicable requirements of ANSI Z60.1 "American Standard for Nursery Stock".

1. Selection of plant material will be made by Landscape Architect (at Landscape Landscape Architect's discretion), who will tag plants at their place of growth before they are prepared for transplanting.

D. Measurements: Measure trees according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6 inches above ground for trees up to 4 - inch caliper size, and 12 inches above ground for larger sizes. Measure main body of tree for height and spread; do not measure braches or roots tip to tip.

E. Applicable Laws: Meet requirements of applicable laws, codes, and regulations required by authorities having jurisdiction over Work.

F. Verification of Dimensions and Quantities: All scaled dimensions are approximate. Before proceeding with any work, carefully check and verify all dimensions and quantities. Immediately inform Owner of all discrepancies between drawings, specifications, and actual conditions. Do not work in any area where there is a discrepancy until approval to proceed has been received from Owner.

G. Forest Certification: Except for mulch and similar recycled wood-based materials and products, provide wood products obtained from forest certified by an FSC-accredited

certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship".

H. Reuse of Nursery Boxes: Containers for plant materials must be reused by plant material supplier or source for new plantings of similar type provided for the Work. Recycling plant containers by remanufacturing (or similar processes) for other uses or landfill (or similar type) disposal is not acceptable.

I. Installation of Owner-Furnished Trees:
1. Arrange and pay for delivery of Owner-furnished trees.
2. Coordinate delivery dates of Owner-furnished trees in Contractor's construction schedule.
3. Review Contract Documents and other information and notify Owner of discrepancies or anticipated problems in installation or Owner-furnished trees.
4. If Owner-furnished trees are damaged as a result of Contractor's operations, Contractor shall be responsible for repair or replacement.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery and while stored at site. The Contractor shall furnish standard products in manufacturer's standard containers bearing original labels showing quantity, analysis, and name of manufacturer. All containers and bags shall remain on site until work is completed.

B. Stockpiling: Soil, mulch, or amendment materials, stored on Project Site temporarily in stockpiles prior to placement shall be protected from intrusion of contaminants and erosion. All stockpiled materials shall be placed on tarpaulin, heavy polyethylene sheeting or other suitable barrier to protect paving surfaces from staining or soiling by stockpiled materials. All temporary storage means and methods shall be approved by Construction Manager and Landscape Architect.

C. Inspection:

1. Plants shall be subjected to inspection and / approval by Landscape Architect (at Landscape Architect's discretion) at the place of growth and again upon delivery and prior to planting for conformity to specification requirements as to quality, size and variety. Such approval shall not impair the right of rejection due to damage suffered in handling, transportation and/or planting. Rejected plants shall be removed immediately from the Project Site. Inspection by Landscape Architect outside the City of Torrance beyond a 90-mile radius from the Project Site shall be made at the expense of the Owner's Park Developer. A Contractor's representative shall be present at all inspections at the Contractor's expense.

2. Written requests for inspection of plant material at their place of growth shall be submitted to Landscape Architect at least 3 days prior to delivery along with submittal of photographs of plants to be inspected. The Landscape Architect may refuse inspection if in his/her judgment a sufficient quantity or quality of plants is not available for inspection. The Contractor shall, at his own expense, supply the Landscape Architect with such labor and assistance as may be necessary in the handling of material for proper inspection. 3. Tagging of trees shall be as follows: for every 20 trees planted, 22 trees will be tagged assuring appropriate replacement for (a) trees damaged prior to transplanting, and (b) trees requiring replacement under terms of the one-year warranty. 4. Reject all materials, prior to planting, that are found unacceptable, and coordinate alternate selections with Landscape Architect. Owner warrants that all Owner-furnished trees and shrubs from outside vendors will be released to Contractor in viable condition. Should Contractor take exception, if taken shall be accompanied by documentation of purported defect and or malady from a recognized authority or expert, at no additional cost to Owner.

D. Trees and Shrubs:

1. Do not prune before delivery, except as approved by Landscape Architect. Protect bark, branches, and root systems from sun-scald, drying, sweating, whipping, and other handling and trying damage. Do not bend trees and shrubs in such a manner as to destroy natural shape. Provide protective covering during delivery.

2. Deliver trees after preparations for planting have been completed and install immediately. If planting is delayed for more than 6 hours after delivery, set planting materials in shade, protect from weather and mechanical damage, and keep roots moist. Notify Contractor and Landscape Architect three (3) days prior to delivery of trees. Do not deliver more trees and shrubs than can be planted in one day. It is not permissible to retail unplanted trees and shrubs on-site overnight.

3. Water as often as necessary to maintain root systems in a moist condition.

E. Ornamental Grasses and Herbaceous Material

1. Deliver healthy container plants. Do not prune before delivery, except as approved by Landscape Architect. Protect plant and root from sun-scald, drying, sweating, whipping, and other handling and tying damage. Provide protective covering during delivery. Do not drop ornamental grasses and herbaceous material during delivery. 2. Deliver ornamental grasses and herbaceous material after preparations for planting have been completed and install immediately. If planting is delayed for more than 6 hours after delivery, set planting materials in shade, protect from weather and mechanical damage, and keep roots moist. Do not deliver more ornamental grasses and herbaceous material than can be planted in one day. It is not permissible to retain unplanted ornamental grasses and herbaceous material on-site overnight.

3. Water as often as necessary to maintain root systems in moist condition.

1.6 PROJECT CONDITIONS

A. Utilities: Determine location of in-planter utilities including lighting, irrigation and drainage in planting areas; and perform work in a manner, which will avoid damage. Hand excavate, as required.

B. Waterproofing: Perform work in a manner, which will avoid damage to planter waterproofing membrane, protection board or other structural sealing materials.

C. Mechanical Lifting: The Contractor shall be responsible for lifting plant material, planting soils and other required material to planter areas for planting through exterior means or lifts as approved by the Contractor and Landscape Architect.

D. Safety: The Contractor shall be responsible for pedestrian and vehicular safety and control within the Project Site. He/she shall provide the necessary warning devices and ground personnel needed to give safety, warning and protection to persons and vehicular traffic within the area.

E. Environmental Requirements and Planting Schedule: Plant weather permits. Do not plant when the ground is frozen, excessively wet, or the soil is otherwise in an unsatisfactory condition for planting.

F. Clean-Up: Upon completion of each phase of work under this section, the Contractor shall clean and remove from the area all unused materials and debris resulting from the performance of the work. All paved areas and walks within the project site shall be left in a clean and safe condition.

1.7 WARRANTY

A. Warranty: Warrant all planting materials, for the warranty period indicated, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, abuse by Owner or Owner's Park Developer, abnormal weather conditions unusual for warranty period, or incidents that are beyond Contractor's control.

1. All plant material (included shrubs and groundcover cover) for a period of one year after the date of Substantial Completion.

2. Remove and replace dead planting materials immediately unless required to plant in the succeeding planting season.

3. Replace planting materials that are more than 25% dead or in an unhealthy condition at end of warranty period.

4. A limit of one replacement of each plant material will be required, except for losses or replacements due to failure to comply with requirements.

1.8 PLANT MAINTENANCE

A. Maintain trees, shrubs and herbaceous plantings by pruning, cultivating, watering, weeding, fertilizing, tightening and repairing stakes and guy supports, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Restore or replace damaged tree wrappings. Maintain trees, shrubs and herbaceous plantings for the following period: 90 days following Substantial Completion.

PART 2 - PRODUCTS

2.1 TREES, SHRUBS, AND VINES

A. General: Furnish nursery-grown trees, shrubs and herbaceous plants conforming to ANSI Z60.1 with healthy roots 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, sun scald, injuries, abrasion, and disfigurement.

1. Grade: Provide trees, shrubs and herbaceous plants of sizes and grades conforming to ANSI Z60.1 for type of tree required. Trees, shrubs and herbaceous plants of a larger size may be used if acceptable to Landscape Architect, with proportionate increase in size of roots or balls or containers.

2. Species: All trees, shrubs and herbaceous plants shall be true to species and cultivar specified. Certification of cultivars by supplying nursery must be supplied in writing to Contractor and Landscape Architect.

3. Labels: Label at least 1 tree, shrub or herbaceous plant of each variety and size with a securely attached, waterproof tag bearing legible designation of botanical and common name. Field Tags by Landscape Architect shall not be removed until so directed by Contractor and Landscape Architect.

4. Single Stem Trees: Single-stem trees with straight trunk, well-balanced crown, and intact leader, of height and caliper indicated, conforming to ANSI Z60.1 for type of trees required.

5. Branching Height: For single-stem trees branching height shall be 5'-0" and not more than *y,* tree height or as required by Landscape Architect or indicated on the Drawings. Limbing up shall not deform natural form of the tree.

6. Multiple-Stem Trees: Multiple-stem trees with multiple basal or low branched stems, and well-balanced crown, of height and caliper indicated, conforming to ANSI Z60.1 for type of trees required. Unless specified otherwise multiple-stem trees shall have 3 to 5 stems minimum.

7. Depth of Planting: The depth of planting must be checked for all trees being tagged at the nursery. If the root/trunk flare is not visible, the root/trunk (the intersection of the trunk and the buttress roots) must be located. Any tree with significant adventitious root growth or evidence of girdling roots shall be subject to rejection by Landscape Architect on a case by case basis. Any soil above the root/trunk flare shall be removed prior to digging. After the removal of any excess soil above the root/trunk flare, the tree shall be hand dug and drum laced.

8. Container Grown Material: Container grown shrubs and herbaceous plants shall be nursery grown, conforming to ANSI Z60,1. Shrubs shall be healthy, vigorous, well rooted, fully branched, symmetrical, and well formed, Container stock shall have well developed fibrous roots, so that the

root mass will retain its shape and hold together when removed from the container. Container plants shall not be root bound.
9. Plugs: Plugs shall be nursery grown, conforming to ANSI Z60.1 and shall be healthy, vigorous, well rooted, fully branched, symmetrical, and well formed. Plugs shall have well developed fibrous roots, so that the root mass will retain its shape and hold together when removed from the container. Container plants shall not be root bound.
10. Substitution: Substitution by Contractor shall not be permitted.
11. Ornamental Grasses and Herbaceous Material Sources: Ornamental grasses and herbaceous material shall be provided by grower specializing in Ornamental Grass and Herbaceous plant production.
12. Sources: Unless otherwise specified all plant materials shall be from a well established Southern California region grower or nursery. Plants shall come from the following sources:
a. GENERAL NURSERIES:

Sources:

Pacific Coast Nursery
1924 Monroe SI.
Riverside, CA 92504
Tel: (951) 689-1777
Fax: (951) 689-1640

Norman's Nursery
8665 Duarte Road
San Gabriel, CA 917775
Tel: (626) 285-9795
Fax: (626) 287-2352

Tree of Life Nursery
33201 Ortega Highway
San Juan Capistrano, CA 92675
Tel: (949) 728-0685
Fax: (949) 728-0509
Or approved equal

2.2 MULCHES

A. General: Mulch to be no more than 3" Shredded Walk On Bark Mulch:
1. Sources:
R&S Soil Product, (949)-830-8884
Aguinaga Fertilizer Company
7992 Irvine Blvd.
Irvine, CA 92618
(949) 786-9558
Or Equal as approved by the City.

2.3 FILTER FABRIC BARRIERS

A. All filter fabric shall be synthetic and rot proof.
B. Non-Woven, UV stabilized, polypropylene geo-textile shall be 140 NL as manufactured by Mirafi 718-461-2200, or approved equal.

2.4 TREE BRACING

A. Stakes: Straight grained lodge pole pine free of knots, splits, checks or disfigurements. Stakes shall be 2 inch minimum nominal size in diameter and 10 feet length, or as required by tree height. Stakes shall have a 10 inch tapered driving point.

1. Support: Supports for staking shall be (2) Cinch Ties by:
   a. VIT Co.
      2063 Wineridge Pl
      Escondido, CA 92029-1931
   b. Or equal.

B. Guy and Tie Wire: No. 10 Gauge Galvanized Wire with:
   1. Protective Rubber Collar.
   2. Galvanized Turnbuckle
   3. JI," diameter X 48" minimum length white PVC Schedule 40 Tubing
   4. 2" diameter X 24" long, 15 Gauge Iron Pipe Stake. Drive flush with grade. Drill (2). 5/16" holes ¾" from top to secure wire 2.5

2.5 LANDSCAPE EDGING

A. Aluminum Landscape Edging: 3/16" X 4", 0.072" thick with 0.135" exposed top lip, Mill Finish.
   1. Sources:
   a. Permaloc Clean - Permaloc Corporation 13505 Barry Street Holland, MI, 49424. Tel. (800) 356-9660, www.permaloc.com

   b. Sureloc Aluminum/Steel Edging, which is located at: 494 E. 64th St. ; Holland, MI 49423; Toll Free Tel: 800-787-3562; Tel: 616-392-3209; Fax: 616-392-5134; Email: info@surelocedging.com; Web: www.surelocedging.com

c. Or equal.

2.6 TRUNK GUARD:

A. Recycled content, polyethylene with ultraviolet inhibitors; 0.060-inch thick x 9-inches high x length for up to 4-inch diameter trunk.

   1. Products:
      a. Arborgard+ AG 9-4; Dimex LLC, 28305 State Route 7, Marietta, OH 45750, (800) 334-3776. (740) 374-3100.
      b. Or equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plantings for compliance with requirements and for conditions affecting performance of Work in this Section.

B. Utilities and Structures located in planting areas. Verify that the locations of lighting, drainage and irrigation utilities, structures and other underground items have been clearly marked.

C. Sequencing: Do not commence planting until site fine grading, soil import, and preparation has been completed and improved by Owner. Endure all drainage swales and flow lines have been established and accepted prior to planting.

D. Inspect and approve all sprinkler work and finish grading prior to the start of shrub and ground cover planting as specified. Trees may be planted in advance of landscape irrigation system installation, provided approval by the Landscape Architect and that adequate provision is made in advance for interim watering.

E. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, waterproofing, drainage structures, planter structures, pavements, and other facilities, and existing trees to remain from damage caused by planting operations. This includes maintaining all protective barriers in place unless directed otherwise by Owner. Vehicles and equipment shall not be parked, serviced, permit burning or operated within drip line of existing trees or within newly planted areas.

B. Remove existing plant materials and planting soils which are designated for removal in the documents.

C. Do not remove, sever or impact root structures of existing trees to remain in the preparation of sub-grade tree pit conditions. Conflicts with existing tree roots shall be brought to the attention of the Landscape Architect who may alter the required configuration to preserve or protect tree roots as they exist

D. Test drainage structures and verify working condition. Verify acceptable condition to protection boards and other waterproofing components and notify Landscape Architect of any damage.

E. Weed Control: Before and during preliminary and finish grading, dig out all weeds and grasses by roots and dispose of off-site. Prior to planting, eliminate any weeds present in delivered plant stock. Unless otherwise instructed by Owner. Grasses not of perennial type, except for Torpedo Grass and Nut Grass, less than 2-112" high and not bearing seeds, may be turned under. Perennial weeds and grasses to be removed include, but are not limited to, the following:

a. Nut Grass
b. St Augustine
c. Puncture Vine
d. Morning Glory
e. Dog Fennel
f. Torpedo Grass
g. Common Bermuda Grass
h. Kikuyu Grass

Remove other noxious or invasive weeds.

Site shall be maintained weed-free throughout planting operations and until final acceptance by Owner. Submit a weed control program to Owner for approval with in 3 days afterward of Contract and prior to starting of work. Include all product information and frequency of weed control operations.

3.3 TREE PLANTING

A. Layout individual tree locations and areas for multiple plantings. Trees shall be staked prior to planting shrubs, grasses, and herbaceous plants in order to establish the planting structure of the site. Stake locations, adjust locations when requested, and secure Landscape Architect's acceptance before the start of planting work.

B. After digging plant hole but prior to installing tree, install Enhanced Soil Drainage according to Planting Soil specifications.

C. Tree root-ball shall be firmly placed on compacted setting bed and established at correct location, elevation and in plumb upright condition. Use temporary guy wires to secure tree in place as required during planting soil placement, to maintain proper setting location. Tree root ball must be set at finish grade so that the original root/trunk flair is at the proper relationship to finished planting soil grade.

D. All ropes and strings must be cut, non-biodegradable material must be *removed* and burlap folded back from the top one-quarter of root-ball. Do not *remove* burlap from lower sides or under root ball. Do not use planting stock if root-ball is cracked or broken before or during planting operation.

E. Only when placement of trees has been approved by Landscape Architect may back-fill planting soil be placed in excavated areas around root ball. Do not make saucer indentations.

F. Back-fill planting soils shall be placed in uniform six to eight inch lifts. Soil must be firmed at each lift interval by hand tamping as required to settle back fill and eliminate voids and air pockets.

G. Staking and Guying: Provide staking per Drawings.

H. Water thoroughly after planting, taking care not to *cover* plant crowns with displaced wet soil. Adjust finish grades and reset plants if settlement occurs. Place mulch and repeat watering procedure.

I. Wrap the trunks of trees immediately after planting with specified trunk guard material at base of tree. Uncoil and place around base of tree. Ensure complete protection with flared end in contact with ground. For larger trunk diameters, couple multiple sections together, securely interlocking tabs as recommended by manufacturer.

3.4 SHRUB AND HERBACEOUS PLANTING

A. Layout individual shrubs, grasses and herbaceous plants for multiple planting areas only after the location of trees *have* been planted. Shrub, Grasses, and Herbaceous groupings shall be marked out on the ground to establish the zones into which these plantings are to be planted. Once the zones are established individual shrubs, grasses and herbaceous plants shall be placed according to specified spacing and layout as indicated on drawings. Stake locations, outline area, and secure Landscape Architect's approval before starting planting. Make adjustments to layout as directed by Landscape Architect.

B. Landscape Architect may request a full temporary placement of plants, still in their pots, according to plan or as directed for inspection by Landscape Architect prior to commencing with planting operation. Landscape Architect may adjust planting layout and spacing at his discretion during the planting operation.

C. Dig holes large enough to allow spreading of roots, and backfill with planting soil. Work soil around root ball to eliminate air pockets. Do not make saucer indentations.

D. Water thoroughly after planting, taking care not to cover plant crowns with displaced wet soil. Adjust finish grades and reset plants if settlement occurs. Place mulch and repeat watering procedure.

3.5 BOX TREE PLANTING

A. All materials for box tree planting shall be on site prior to start of installation. After pavement treatment has been completed and approved by Landscape Architect, mark locations of boxes, adjust locations when requested, and secure Landscape Architect acceptance before moving boxes to final location. Review tree type with box location for approval by Landscape Architect prior to planting.

B. During planting process Contractor responsible to keep paving and other site amenities clean.

C. Tree root-ball shall be firmly placed on compacted setting bed and established at correct location, elevation and in plumb upright condition. Use stakes to secure tree in place as required during planting soil placement, to maintain proper setting location. Tree root ball must be set at finish grade so that the original root/trunk flair is at the proper relationship to finished planting soil grade. Planter soil levels shall be below top of planter box:

a. 3" below for 36" box
b. 3" below for 60" box trees and Greater

D. Only when placement of trees has been approved by Landscape Architect may planter soil be placed in areas around root ball. Do not make saucer indentations.

E. Planter soils shall be placed in uniform six to eight inch lifts. Soil must be firmed at each lift interval by hand tamping as required to settle back fill and eliminate voids and air pockets.

F. Staking and Guying: Provide staking per Drawings.

G. Water thoroughly after planting, taking care not to cover plant crowns with displaced wet soil. Adjust finish grades and reset plants if settlement occurs. Place mulch and repeat watering procedure.

3.6 MULCH PLACEMENT

A. Place shredded bark mulch at areas indicated in the drawings. Protect planting material from damage during and after installation of mulch.

B. Place aggregate mulch; refer to Section 02738, at locations indicated in the drawings. Protect planting material from damage during and after installation of mulch.

3.7 INITIAL PRUNING

A. Contractor shall prune trees and shrubs as directed by Landscape Architect and according to the Contract Documents

1. Prune, thin and shape trees and shrubs according to standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by Landscape Architect, do not cut tree leaders; remove only injured or dead branches.

3.8 CLEAN-UP AND PROTECTION

A. During landscaping keep pavements clean and work area in orderly condition. Protect landscaping from damage due to landscape operations, operations by other contractors and trades and trespassers. Treat, repair or replace damaged landscape work as directed.

3.9 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil. Tree boxes, Trash, and debris, and legally dispose of it off of the Owner's property.

3.10 FINAL INSPECTION AND FINAL ACCEPTANCE

A. At the end of the warranty period the Landscape Architect and Owner will inspect all warranted work at the written request of the Contractor. The request shall be received 10 calendar days before the anticipated date for Final Inspection.

END OF SECTION 02900

SECTION 02935 - MAINTENANCE OF PLANTING
PART 1 - GENERAL

1.01 SUMMARY

A. Section includes maintenance of planting.

B. Related Sections:

1. Division 2 Section "Amending Planting Soils" for requirements related to amending subgrade planting soils.

1.02 SUBMITTALS

A. Product Data: For each type of product indicated.
1. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to this project.

B. Work Plan: Submit a work plan describing sub-grade preparation and maintenance procedures prior to performing work.

1. Include detailed description of methods, equipment, and accessory/supplementary materials used for each specific operation and sequence of operations.

a. Delineate methods for sub-grade preparation and maintenance procedures.
b. Include detailed description of procedures to compensate for changes in construction schedule milestones.

2. Include description of interfacing with other trades, and sequencing of related work.
3. Include schedule when sub-grade preparation operations will be performed.

a. Indicate, by day, when specific sub-grade preparations are to be performed. Note other activities affecting or affected by the work of this section, including Owner's installation of turf sod, relative to sub-grade preparation schedule milestones.

C. Qualification Data: For qualified landscape contractor

D. Maintenance Instructions: Recommended maintenance procedures to be utilized by Owner for maintenance of plants during a complete, full calendar year. Submit before expiration of Contractor's maintenance periods.

1.03 QUALITY ASSURANCE

A. Installer Qualifications: A qualified contractor whose work of the specific type indicated, has resulted in successful plant establishment and maintenance.

1. Professional Membership: Member in good standing of either the Professional Landcare Network, American Nursery and Landscape Association, or other recognized organization acceptable to Owner.
2. Experience: Three years' experience in plant installation and maintenance.
3. Field Supervision: Required to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Personnel Certifications: Field supervisor assigned to the Work shall have certification in one of the following categories from the Professional Landcare

Network, or other equivalent, recognized certification process acceptable to owner.

a. Certified Landscape Technician - Exterior, with maintenance specialty area(s), designated CLT- Exterior.
b. Certified Turfgrass Professional, designated CTP.
c. Certified Turfgrass Professional of Cool Season Lawns, designated CTP-CSL.

5. Pesticide Applicator: State licensed, commercial.

B. Pre-Work Conference: Conduct conference at Project site

1.04 PROJECT CONDITIONS

A. Work Restrictions: Coordinate work of this section, including sub-grade preparation and maintenance periods with periods of planting (by others) to provide required maintenance from date of planting completion.

B. Weather Limitations: Proceed with work, including maintenance procedures only when existing and forecasted weather conditions permit work and maintenance to be performed when beneficial and optimum results may be obtained. Perform maintenance procedures during favorable weather conditions according to plant material source supplier's written instructions.

1.05 MAINTENANCE SERVICE

A. Initial Maintenance Service: Provide full maintenance by skilled, qualified personnel. Maintain as required in Part 3. Begin maintenance immediately after ach area is planted and continue until planting is established, and acceptable to Owner, but for the following period:

1. From date of planting completion until date of acceptance of maintenance responsibilities, as established by Owner.

PART 2 -PRODUCTS

2.01 PLANTING SOILS, INCLUDING AMENDMENTS

A. Refer to Division 32 Section "Amending Planting Soils" for requirements related to planting soils and amendments (including fertilizers) for sub-grade planting soils.

2.02 PESTICIDES

A. General: Pesticides, registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by plant growers/supplier for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds.

C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine sub-grade areas to be prepared (and planted) for compliance with requirements and other conditions affecting performance.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

1. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Landscape Architect and replace with new planting soil.

3.02 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by Contractor's operations.

1. Protect grade stakes, flags, and other markings set by others until directed to remove them.

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

3.03 PREPARATION

A. Limit sub-grade preparation to areas to be planted.

B. Comply with Division 32 Section "Amending Planting Soils" for requirements related to amending (including fertilizing) and otherwise preparing, sub-grade for planting.

1. Reduce elevation of planting soil to allow for soil thickness of sod.
2. Legally dispose of waster material, including grass, vegetation, and turf, off Owner's property.

C. Moisten prepared area immediately before planting commences if soil is dry. Water thoroughly and allow surface to dry before planting commences. Do not create muddy soil.

D. Before planting commences, obtain Landscape Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finishing grading.

3.04 TURF MAINTENACE

A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, re-grade, and replant bare or eroded areas and re-mulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.

2. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

3. Subsequent to turf sod grower/supplier's inspection and approval of turf sod conditions, perform (or provide for) mechanical rolling of turf sod when well-rooted, approximately two weeks after installation.

   a. Perform rolling with "ride-on" type double-drum roller, as recommended by turf sod grower/supplier.

B. Watering: Where sprinkler/irrigation systems are not operational, install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist, as recommended by turf grower/supplier.

1. Schedule watering to prevent wilting, pudding, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.

C. Mow turf as soon as growth is tall enough to cut, as recommended by turf grower/supplier. Do not excessively delay mowing to the extent of being detrimental to growth and health of turf. Do not mow when grass is wet. Schedule Initial and subsequent mowings at intervals as recommended by turf growers/supplier.

D. Turf postfertilization: Apply fertilizer at intervals, under conditions and rate, as recommended by turf growers/supplier.

3.05 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Landscape Architect:
1. Healthy, well-rooted, uniform, even appearance, free of weeds, undesirable vegetation, and surface irregularities.

B. Reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

3.06 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents in accordance with requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work, Notify Owner before each application is performed.

B. Pre-Emergent Herbicides (Selective and Non-Selective): Apply in accordance with manufacturer's written recommendations.

3.07 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by sub-grade preparatory work and continuing maintenance procedures from paved and adjacent areas. Clean wheels of vehicles before

leaving site to avoid tracking soil onto roads, walks, or other paved areas. B. Erect temporary fencing or barricades and warning signs as required to protect planted areas from traffic and damage from other contractor's operations. Maintain fencing and barricades throughout maintenance period and remove when directed or permitted by Landscape Architect.

3.08 RENOVATION

A. Renovate planting damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.

1. Reestablish planting where settlement or washouts occur or where minor re-grading is required.

2. Install new planting soil as required.

B. Remove diseased or unsatisfactory areas; do not bury in soil.

C. Remove topsoil containing foreign materials such as oil drippings, fuel spills, stones, gravel, and other constructions materials resulting from Contractor's operations, and replace with new planting soil.

D. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, legally dispose of them off Owner's property.

E. Apply soil amendments and initial fertilizers required for establishing new plantings. Install new planting soil to fill low spots and meet finish grades.

END OF SECTION

CXT INCORPORATED
SPOKANE, WASHINGTON

SPECIFICATIONS FOR OZARK I STYLE FLUSH TOILET BUILDINGS

1.0 SCOPE

This specification covers the construction and placing of the Ozark I precast concrete flush toilet building as produced by CXT Incorporated.

2.0 SPECIFICATIONS

ASTM C33	Concrete Aggregates
ASTM C39	Method of Test for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C143	Method of Test for Slump of Concrete
ASTM C150	Standard Specification for Portland Cement
ASTM A185	Standard Specification for Steel Welded Wire Reinforcement, Plain, or Concrete
ASTM C192	Method of Making and Curing Test Specimens in the Laboratory
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C309	Standard Specifications for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM C979	Standard Specification for Pigments for Integrally Colored Concrete
ACI 211.1	Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
ACI 306	Cold Weather Concreting
ACI 318	Building Code Requirements Structural Concrete and Commentary (includes Errata)

PCI MNL 116 Quality Control for Plants and Production of Precast Prestressed Concrete Products

3.0 MANUFACTURER CRITERIA

The manufacturer supplying the requested precast concrete flush facility must meet the following:

A. Manufacturer must be ISO 9001 certified at the time of bid.

B. Manufacturing plant must be PCI certified at the time of bid.

C. Manufacturer must not have defaulted on any contract within the last five years.

D. Manufacturer must provide stamped, engineered drawings prior to acceptance.

E. Manufacturer must be pre-approved prior to bidding.

F. Manufacturer must show four examples of precast concrete flush facilities produced, installed and in use as an example of their ability to perform this contract.

Manufacturers meeting these criteria are:

CXT, Incorporated
Spokane Industrial Park
3808 North Sullivan Road, Building 7
Spokane, WA 99216
Phone: 800-696-5766

4.0 DESIGN CRITERIA

The Ozark I has been designed to meet the following criteria. Calculations and Engineer's stamped drawings are available, for standard buildings, upon request by the customer and are for their sole and specific use only. The design criteria are to ensure that the Ozark I not only will withstand the forces of nature listed below but to provide protection from vandalism and other unforeseen hazards. Design criteria include 2006 IBC Code, 2006 IPC, 2008 NEC.

A. Roof Snow Load

1. The Ozark I is designed to withstand a 250 pounds per square foot snow load.

B. Floor Load

1. The Ozark I is designed to withstand 400 pounds per square foot floor load.

C. Wind Load

1. The Ozark I will withstand the effects of 150 mile per hour (3-second gust) wind exposure C.

D. Earthquake

1. The Ozark I will withstand the effects of a seismic group 1 seismic design category E earthquake.

E. Additional Design Standards

1. The Ozark I is designed to meet the requirements of the sixty-inch turning radius inside toilet room specified by the American with Disabilities Act Requirements and Uniform Federal Accessibility Standards as of the date of these specifications.
2. The Ozark I is an all concrete design with a minimum 3/12 roof pitch.

5.0 MATERIALS

A. Concrete - General

The concrete mix design will be designed to ACI 211.1 to produce concrete of good workability.

1. Concrete will contain a minimum of 505 pounds of cement per cubic yard. Cement will be a low alkali type I/II or III conforming to ASTM C-150.
2. Coarse aggregates used in the concrete mix design will conform to ASTM C33 with the designated size of coarse aggregate #67.
3. Minimum water/cement ratio will not exceed .45.
4. Air-entraining admixtures will conform to ASTM C260. Water reducing admixtures will conform to ASTM C494, Type A.

B. Colored Concrete

1. Color additives will conform to ASTM C979. A12"x12"x1" color sample will be available for customer approval.
2. The following will contain colored concrete:
   a. Toilet building roof panels
   b. Building walls
   c. Screen panels
3. The same brand and type of color additive will be used throughout the manufacturing process.
4. All ingredients will be weighed and the mixing operation will be adequate to ensure uniform dispersion of the color.

C. Cold Weather Concrete

1. Cold weather concrete placement will be in accordance with ACI 306.

2. Concrete will not be placed if ambient temperature is expected to be below 35 degrees F. during the curing period unless heat is readily available to maintain the surface temperature of the concrete at least 45 degrees F.
3. Materials containing frost or lumps of frozen materials will not be used.

D. Hot Weather Concrete

The temperature of the concrete will not exceed 95 degrees F. at the time of placement. When the ambient reaches 90 degrees F. the concrete will be protected with moist covering.

E. Concrete Reinforcement

1. All reinforcing steel will conform to ASTM A615. All welded wire fabric will conform to ASTM A185.
2. All reinforcement will be new, free of dirt, oil, paint, grease, loose mill scale and loose or thick rust when placed.
3. Details not shown of drawings or specified will be to ACI318.
4. Steel reinforcement will be centered in the cross-sectional area of the walls and will have at least 1" of cover on the under surface of the floor and roof.
5. The maximum allowable variation for center-center spacing of reinforcing steel will be ½".
6. Full lengths of reinforcing steel will be used when possible. When splices are necessary on long runs, splices will be alternated from opposite sides of the components for adjacent steel bars. Lap bars #4 or smaller a minimum of 12". Lap bars larger than #4 a minimum of 24 bar diameters.
7. Reinforcing bars will be bent cold. No bars partially embedded in concrete will be field bent unless approved by the customer.

F. Sealers and Curing Compounds

1. Curing compounds, if used, will be colorless, complying with ASTM C309, type I or 1-D.
2. Weatherproofing sealer for exterior of building will be a clear water repellent penetrating sealer.

G. Caulking, Grout, Adhesive and Sealer

1. Caulking service temperatures from -40 to +140 degrees Fahrenheit.
2. Interior and exterior joints will be caulked with a paintable polyurethane sealant.
3. Grout will be a non- shrink type and will be painted to match the color of surrounding concrete as nearly as possible.
4. Cement base coating is formulated with a very fine aggregate system and a built in bonding agent.

H. Paint

1. All paints and materials will conform to all Federal specifications or be similar "top-of-the-line-components". Paints will not contain more than .06 percent by weight of lead.
2. Type of paints for toilets.
   a. Inside concrete surfaces.
      I Interior floors will be a high solid single-component, chemical and urine resistant aliphatic moisture cure urethane, that meets ADA requirements for slip resistance. The color will be gray.
      II Interior walls and ceilings will be a modified acrylic, water repellent penetrating stain. The color will be white followed by a clear acrylic anti-graffiti sealer.
   b. Metal surfaces both inside and out.
      I DTM ALKYD.
   c. Exterior concrete surfaces.
      I Exterior slab will be clear sealer.
      II Exterior walls and roof will be a water repellent penetrating stain in the same color as the walls or roof followed by a clear acrylic anti-graffiti sealer.

I. Grab bars

Grab bars will be 18 gauge, type 304 stainless steel with 1-1/2" clearance. Grab bars will each be able to withstand 300 pound top loading.

J. Toilet Paper Dispenser

Dispenser will be constructed of ¼" thick, type 304 stainless steel. Dispenser will be capable of holding three (3) standard rolls of toilet paper. Toilet paper holder fastening system will be able to withstand 300 pound top loading.

K. Steel Doors

1. Doors will be flush panel type 1-3/4" thick, minimum 16 gauge galvanized steel, top painted with DTM ALKYD.
2. Door frames will be knockdown or welded type, single rabbet, minimum 16 gauge galvanized steel top painted with DTM ALKYD, width to suit wall thickness. Three (3) rubber door silencers will be provided on latch side of frame.

L. Door Hinges

Door hinges will be 3 per door with dull chrome plating 4-1/2"x4-1/2", adjustable tension, automatic-closing for each door.

M. Lockset

1. Lockset will meet ANSI A156.2 Series 4000, Grade 1 cylindrical lockset for exterior door.
2. Lever handle both inside and out.
3. Either handle operates latch unless outside handle is locked by inside push-button.
4. Push-button will automatically release when inside lever handle is turned or door is closed.
5. Emergency slot on exterior so door can be unlocked from the outside with a coin, screwdriver and etc.
6. Inside lever always active.
7. U.S. 26D finish.

N. Optional Dead Bolt

Deadbolt will be a Schlage standard model with a single cylinder, 2 ¾" backset, and 626 finish. The cylinder will be a standard B661P Schlage.

O. Door Stop

Doorstop will be a dome style stop meeting ANSI 156.16.

P. Double Coat Hook

Coat hook will be 304 stainless steel 16 gauge (1.5mm), formed construction with a satin finish and have 3/16"x 7/8" nail in anchor. Upper hook will extend at least 2-1/2" inches from the wall. Lower hook will extend at least 1-1/4" from the wall.

Q. Mirror

Mirror to be 18" x 36" stainless steel.

R. Door Sweep

Door sweep will be provided at the bottom of door and will be an adjustable brush type.

S. Wall Vent

Wall vent will be crank operated allowing the unit to be opened or closed. Crank will be removable. Wall vent frame will be cast into the concrete wall. The units' frame will be C3 x 4.1 channel steel. The louver frame and louvers will be 18 gauge zinc coated steel with baked enamel finish. Vent to come with insect screen.

T. Windows

1. Windows constructed from steel.
2. Window glazing will be 3/16" thick translucent pebble finished mar-resistant Lexan.

U. Plumbing

1. All fixtures to meet ANSI A112.19.2
2. Waste and vent material will be ABS or PVC plastic and will be plumbed to meet Uniform Building Codes.
3. Water material will be copper tubing Type L, hard drawn. A gate valve will be provided at the inlet end of the water line. All water lines will be of a size to provide proper flushing action based on a nominal water pressure of 40 psi.
4. All plumbing will be concealed in the service area.
5. Toilet will be constructed of vitreous china, wall hung, with siphon jet action. Toilet will have a back spud for a concealed flush valve connection and will be mounted with the top of the seat 17 inches above the finished floor. Seat will be heavy duty solid plastic with an open front. Optional stainless steel fixtures available.
6. Flush valve will be concealed closet flush-o-meter constructed of rough brass. Furnish valve with integral vacuum breaker and wall mounted push button. Valve will be of a water saver type with a flow of 1.6 gallons per flush.
7. Lavatory will be vitreous china with back splashguard, front overflow opening, equipped with brass trap and drainpipe without stopper. Sink will be 20 inches wide x 18 inches front to back x 5 ¾ inches deep with ADA trap cover.
8. Water valve will be self-closing water set with indexed push button.
9. Hose bib available in the chase area.
10. A main shut-off valve and drain will be provided with plumbing.
11. Hammer arrester to be installed on water line.
12. Trap primer distribution unit shall be installed.
13. Optional Instant-Flow tankless electric water heater. Temperature rise of 75 degrees at .5gpm with a temperature preset of 104 degrees.

V. Electrical

1. All components UL listed
2. All electrical wiring will be in conduit, surface mounted in the service area and concealed in the user compartments. All wire will be copper.
3. A 100-amp NEMA 3R breaker panel will be provided and must be mounted on the exterior of the building to meet electrical code.
4. The chase area will have, cast in both common walls, Lexan windows to allow light into each toilet room with one (1) 4-foot 3 bulb ceiling mounted low temperature ballast light fixture.
5. 2 exterior 35-watt High Pressure Sodium lights, polycarbonate vandal resistant.
6. The hand dryer is an air compression type with remote motor unit. Push button switch located in cast nozzle housing with flexible hose connecting

blower motor, housing and nozzle. Power input 120VAC, 7A (non-heated air).

7. Two GFI outlets located next to the sink.
8. Two restroom area exhaust fans HVI certified, with 270 CFM speed controlled (control in chase area).
9. Lighting on the exterior of building will be photocell activated; interior will be motion activated; override switch in chase/utility room.

6.0 MANUFACTURE

A. Mixing and Delivery of Concrete

Mixing and delivery of concrete will be in accordance with ASTM C94, section 10.6 through 10.9 with the following additions:

1. Aggregate and water will be adjusted to compensate for differences in the saturated surface-dry condition.
2. Concrete will be discharged as soon as possible after mixing is complete. This time will not exceed 30 minutes.

B. Placing and Consolidating Concrete

Concrete will be consolidated by the use of mechanical vibrators. Vibration will be sufficient to accomplish compaction but not to the point that segregation occurs.

C. Finishing Concrete

1. Interior floor and exterior slabs will be floated and troweled. A light broom finish will be applied to the exterior slabs.
2. All exterior building walls and exterior screen walls will be a barnwood texture (optional textures available).
3. All exterior surfaces of the roof panels will be cast to simulate a cedar shake roof. The underside of the overhang will have a smooth finish (optional roof textures available).

D. Cracks and Patching

1. Cracks in concrete components which are judged to affect the structural integrity of the building will be rejected.
2. Small holes, depressions and air voids will be patched with a suitable material. The patch will match the finish and texture of the surrounding surface.
3. Patching will not be allowed on defective areas if the structural integrity of the building is affected.

E. Curing and Hardening Concrete

1. Concrete surfaces will not be allowed to dry out from exposure to hot,

dry weather during initial curing period.

7.0 FINISHING AND FABRICATION

A. Structural Joints

1. Wall components will be joined together with two welded plate pairs at each joint. Each weld plate will be 6" long and located one pair in the top quarter and one pair in the bottom quarter of the seam. Weld plates will be anchored into the concrete panel and welded together with a continuous weld. The inside seams will be a paintable caulk. The outside seams will use a caulk in a coordinating building color or clear.
2. Walls and roof will be joined with weld plates, 3"x 6", at each building corner.
3. The joint between the floor slab and walls will be joined with a grout mixture on the inside, a matched colored caulk on the outside and two weld plates 6" long per wall.

B. Painting/Staining

1. An appropriate curing time will be allowed before paint is applied to concrete.
2. Some applications may require acid etching. A 30% solution of hydrochloric acid will be used, flushed with water and allowed to thoroughly air dry.
3. Painting will not be done outside in cold, frosty or damp weather.
4. Painting will not be done outside in winter unless the temperature is 50 degrees F. or higher.
5. Painting will not be done in dusty areas.
6. Schedule of finishes.
    a. Inside concrete surfaces.
        I Interior floors will be one coat of a high solid single-component, chemical and urine resistant aliphatic moisture cure urethane, that meets ADA requirements for slip resistance.
        II Interior walls and ceilings will be 2 coats of a modified acrylic, water repellent penetrating stain, followed by 1 coat of clear sealer.
    b. Metal surfaces both inside and out.
        I 2 coats of DTM ALKYD.
    c. Exterior concrete surfaces.
        I Exterior slab will be 1 coat of clear sealer.
        II Exterior walls will be 2 coats of water repellent penetrating stain in the same color as the walls or roof followed by 1 coat of clear acrylic anti-graffiti sealer.

8.0 TESTING

A. The following tests will be performed on concrete used in the manufacture of toilets. All testing will be performed in the CXT (PCI certified) laboratories. Testing will only be performed by qualified individuals who have been certified ACI Technician Grade 1. Sampling will be in accordance with ASTM C172.

1. The air content of the concrete will be checked per ASTM C231 on the first batch of concrete. The air content will be in the range of 5.0 ± 2%.
2. The compressive strength of the cylinders will be tested to ASTM C39. We will make one (1) cylinder for release, one (1) for 7 days and one (1) for 28 days. The release must be a minimum strength of 2500 psi, the 7-day must be a minimum of 4500 psi and the 28-day must be a minimum of 5000 psi.
3. A copy of all test reports will be available to the customer as soon as 28-day test results are available.

9.0 INSTALLATION

A. Scope of Work

Work specified under this Section relates to the placement of the unit by CXT on customer prepared foundations.

B. Location

It's the responsibility of the customer to:

1. Provide exact location by stakes or other approved method.
2. Provide clear and level site free of overhead and/or underground obstructions.
3. Provide access to the site for truck delivery and sufficient area for the crane to install and the equipment to perform the contract requirements.
4. Water, electrical, and sewage site connections to be placed per CXT drawings. Must be placed to easily connect to the building.

C. Compacting

The bottom of the area must be compacted after it has been dug out. After the base has been placed, it must be compacted as well. The bearing of the soil and base should be a minimum of 1,500 pounds per square foot.

D. Base

After compacting the bottom of the area, a minimum of 6" of a compacted, ¾" minus material base of gravel (i.e. road base) should be placed for support, leveling and drainage purposes. The base also limits frost action. The base must be confined so as to prevent washout, erosion or any other undermining.

E. Access to Site

Delivery to site made on normal highway trucks and trailers. If at the time of delivery conditions of access are hazardous or unsuitable for truck and equipment due to weather, physical constraints, roadway width or grade, CXT may require an alternate site with better access provided to ensure a safe and quality installation. In any such case, additional costs for cranes, trucking, and etc. will be charged to the account of the customer.

10.0 WARRANTY—PRECAST DIVISION

CXT warrants that all goods sold pursuant hereto will, when delivered, conform to specifications set forth above. Goods shall be deemed accepted and meeting specifications unless notice identifying the nature of any non-conformity is provided to CXT in writing within one (1) year of delivery. CXT, at its option, will repair or replace the goods or issue credit for the customer provided CXT is first given the opportunity to inspect such goods. It is specifically understood that CXT's obligation hereunder is for credit, repair or replacement only, F.O.B. CXT's manufacturing plant, Spokane, Washington and does not include shipping, handling, installation or other incidental or consequential costs unless otherwise agreed to in writing by CXT.

This warranty shall not apply to:

1. Any goods which have been repaired or altered without CXT's express written consent, in such a way as in the reasonable judgement of CXT, to adversely affect the stability or reliability thereof;
2. To any goods which have been subject to misuse, negligence, acts of God or accidents or
3. To any goods which have not been installed to manufacturer's specifications and guidelines, improperly maintained, or used outside of the specifications for which such goods were designed.

11.0 DISCLAIMER OF OTHER WARRANTIES

The warranty set forth above is in lieu of all other warranties, express or implied. All other warranties are hereby disclaimed. CXT makes no other warranty, express or implied, including, without limitation, no warranty of merchantability of fitness for a particular purpose or use.

12.0 LIMITATION OF REMEDIES

In the event of any breach of any obligation hereunder, breach of any warranty regarding the goods or any negligent act or omission or any party, the parties shall otherwise have all rights and remedies available at law; however, IN NO EVENT SHALL CXT BE SUBJECT TO OR LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

SECTION 04220 – CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Division 01 Specification Sections, Drawings, General Conditions, Supplementary General Conditions, and Special Conditions apply to this section.

1.2 SUMMARY

A. Section Includes:
1. Concrete masonry units (CMUs).
2. Mortar and grout.
3. Reinforcing steel.
4. Control joint materials.
5. Masonry joint reinforcement.
6. Ties and anchors.
7. Embedded flashing.
8. Miscellaneous masonry accessories.

B. Products installed, but not furnished, under this Section:
1. Section 055000 Metal Fabrication for steel lintels and shelf angles for unit masonry.
2. Section 076200 Sheet Metal Flashing and Trim.

C. Related Sections:
1. Section 042713 Composite Unit Masonry.
2. Section 076200 Sheet Metal Flashing and Trim for exposed sheet metal flashing.
3. Section 079200 Joint Sealants for sealing control and expansion joints in unit masonry.

1.3 SUBMITTALS

A. Certificates of compliance with respective ASTM standards shall be submitted on all products specified herein.
1. Concrete masonry units.
2. Spec Mix preblended mortar: Include test report or batch data for verification of proportions of materials.
3. Grout: Include mix design for verification of proportions of materials.
4. Steel reinforcing bars.
5. Preformed control joint gaskets.

B. Samples for Verification: For each type and color of the following:
1. Exposed concrete masonry units.
2. Mortar, for color selection or confirmation.

1.4 QUALITY ASSURANCE

A. Preconstruction Testing.
   1. Owner will select a qualified independent testing agency to perform preconstruction testing indicated below. Payment for these services will be made by Owner.
   2. The compressive strength of masonry shall be determined based on strength of the unit and type of mortar specified (Unit Strength Method) per IBC Table 2105.2.2.1.2 (ACI 530.1/ASCE 6/TMS 602 Table 2).
      a. Concrete Masonry Units: Test per ASTM C 140.
      b. Grout: Test per ASTM C 1019.
   3. The compressive strength of masonry shall be determined by the prism test method in accordance with ASTM C 1314. Schedule masonry procurement sufficiently in advance to allow for prism construction and curing.
      a. Prism Test: For each type of construction required, construct and test threeprisms per ASTM C 1314.
   4. Mortar and grout tests: At beginning of work, sample mortar and grout on three successive working days per CBC Section 2105A.5.

B. Sample Panels: Construct an approximate long by panel for representation of completed masonry, joint tooling, design details, and workmanship. Comply with requirements in Division 01 Section "Quality Requirements" for mockups.
   1. The following shall be installed in the sample panel:
      a.
      b.
      c.

C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination",

1.5 DELIVERY, STORAGE, AND HANDLING

A. All materials of this section shall be protected to maintain quality and physical requirements.

B. All masonry units shall be stored on the jobsite so that they are protected from rain, stored off-ground and kept clean from contamination. Prevent units from being otherwise wetted.

C. Store Spec Mix preblended mortar mix in manufacturer's original, unopened, undamaged containers with identification labels intact, covered and protected from weather, or in a Spec Mix dispensing silo.

1.6 FIELD CONDITIONS

A. Securely cover tops of all unsheltered walls and partially completed walls when work is not in progress.

B. Hot-weather procedures when ambient temperature exceeds 100°F (38°C), or exceeds 90°F(32°C) with a wind velocity greater than 8 mph:
   1. Implement hot weather construction procedures in accordance with IBC Section 2104.4.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Concrete masonry units.
1. Angelus Block Co., Inc.
a. Sun Valley, CA (818) 767-8576
b. Orange, CA (714) 637-8594
c. Fontana, CA (909) 350-0244
d. Gardena, CA (310) 323-8841
e. Oxnard, CA (805) 485-1137
f. Indio, CA (760) 347-3245

B. Preblended mortar.
1. Spec Mix Preblended Mortar Mix, by E-Z Mix, Inc.

2.2 MASONRY PERFORMANCE REQUIREMENTS

A. Provide materials to achieve the net compressive strength of concrete unit masonry equal to or greater than 1500 psi f'_m.

B. Provide materials to achieve the net compressive strength of concrete unit masonry equal to or greater than the f'_m as indicated .

2.3 CONCRETE MASONRY UNITS

A. Concrete Masonry Units: ASTM C 90.
1. Weight Classification: Mediumweight unless otherwise indicated.
2. Color(s) and texture(s):
a.

2.4 MORTAR AND GROUT MATERIALS

A. Spec Mix Masonry Mortar preblended factory mix: ASTM C 270, proportions.
1. Portland cement: ASTM C 150
2. Hydrated lime: ASTM C 207
3. Aggregate for mortar: ASTM C 144.

B. Grout:
1. Portland cement: ASTM C 150
2. Aggregate: ASTM C 404.
3. Fly ash: ASTM C 618.

C. Water: Potable.

D. Admixtures:

1. The use of admixtures shall not be permitted except as specified herein, or as approved by the Architect or Engineer of Record and the Building Official.
2. PRE-MIX Products Grout Additive manufactured by E-Z Mix, Inc. Use per manufacturer's specifications.

2.5 REINFORCEMENT

A. Steel Reinforcing Bars: ASTM A 615, Grade 60.

B. Masonry Joint Reinforcement: ASTM A 951.
1. Masonry joint reinforcement used in exterior walls shall be hot-dipped galvanized.

2.6 TIES AND ANCHORS

A. Metal ties and anchors shall meet the requirements of IBC Section 2103.13.

2.7 FLASHING MATERIALS

A. Provide metal flashing in accordance with Section 076200 Sheet Metal Flashing and Trim.

2.8 MISCELLANEOUS MASONRY ACCESSORIES

A. PVC Preformed Control-Joint Gaskets: per ASTM D 2287, Type PVC.

B. Rubber Preformed Control-Joint Gaskets: per ASTM D 2000, Designation M2AA-805.

2.9 MORTAR AND GROUT MIXES

A. Type S Spec Mix Preblended, Dry Mortar Mix.
1. Complies with ASTM C 270 Proportion Specification.
2. Natural gray color.

B. Grout for Unit Masonry: per ASTM C 476.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to the start of masonry installation, verify all conditions pertinent to the performance of work in this Section are acceptable.
1. Foundation shall be level and at correct grade such that the initial bed joint shall not be less than 1/4 inch nor more than 3/4 inch.
2. Verify that reinforcing dowels are properly placed.

B. Masonry work shall not proceed until unsatisfactory conditions have been corrected or cleared by the governing authority.

3.2 INSTALLATION

A. Cut units as required to fit; use motor-driven masonry saw. Install cut units with cut surfaces edges concealed as much as possible.

B. Lay dry units only, unless otherwise approved.

C. Select and arrange units for exposed masonry to produce a uniform blend of colors and textures.
   1. Mix units from several pallets or cubes as they are placed.

D. Comply with construction tolerances in ACI 530.1/ASCE 6/TMS 602.

3.3 LAYING MASONRY WALLS

A. All masonry shall be laid true, level, plumb, and in accordance with the drawings.

B. Masonry shall be laid in running bond unless otherwise indicated.

C. Concealed masonry with shall be laid in running bond unless otherwise indicated.

D. Install built-in items specified in this and other Sections as work progresses. Solid grout all spaces around built-in items unless otherwise noted on the drawings.

3.4 MORTAR BEDDING AND JOINTING

A. Lay hollow units with head and bed joints filled with mortar for the thickness of the face shell..

B. Lay solid units with full head and bed joints. Do not fill head joints by slushing with mortar. Bed joints shall not be furrowed deep enough to produce voids.

C. All mortar joints on exposed walls shall be concave, unless otherwise indicated, and struck to produce a dense, slightly concave surface well bonded to the surface of the masonry unit.

D. Cut joints flush for masonry walls to receive plaster, unless otherwise indicated.

E. Thickness of bed joints shall not exceed 5/8 inch.

3.5 MASONRY JOINT REINFORCEMENT

A. Embed joint reinforcement with minimum 5/8 inch cover to exposed face, and 1/2 inch elsewhere.

3.6 CONTROL AND EXPANSION JOINTS

A. Construct control joints as detailed in the drawings as masonry progresses.
   1. Install preformed control-joint gaskets designed to fit standard sash block.

3.7 INSTALLATION OF REINFORCING STEEL

A. Place reinforcement as detailed on the drawings.
   1. Maintain clear distances between reinforcement and masonry, and maintain placement tolerances in compliance with requirements in ACI 530.1/ASCE 6/TMS 602.

3.8 GROUTING

A. Comply with grout placement requirements in ACI 530.1/ASCE 6/TMS 602.

3.9 FIELD QUALITY CONTROL

A. Inspection tasks and frequency shall be performed in accordance with the Statement of Special Inspections.

B. Unless indicated otherwise, perform one set of tests for each 5000 sq. ft. of wall area or portion thereof.

C. Concrete Masonry Units: test per ASTM C 140.

D. Grout: Test per ASTM C 1019.

E. Prism Test: For each type of construction indicated, construct and test three prisms per ASTM C 1314 at 28 days.

F. Masonry Core Test: Core and test per CBC Section 2105A.4 from locations selected by the Design Professional.

G. Mortar and grout tests: Sample mortar and grout at minimum one-week intervals per CBC Section 2105A.5.

3.10 POINTING, AND CLEANING

A. Point and tool holes in mortar joints to produce a uniform, tight joint.

B. During construction, minimize any mortar or grout stains on the wall. Immediately remove any staining or soiling that occurs.
   1. For precision or textured units, except as noted below, clean masonry by dry brushing before tooling joints.
   2. For burnished concrete masonry units, immediately remove any green mortar smears or soiling with a damp sponge

C. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Clean exposed cmu walls with a light sandblast. All nonmasonry work near the area to be sandblasted shall be covered or protected before the sandblasting starts. Care shall be taken to avoid contamination to areas that are not to be sandblasted.
   a. Glazed, burnished, or pre-finished masonry units, shall be protected from sandblast operations.

D. At completion of masonry work, remove all scaffolding and equipment used during construction, and remove all debris, refuse, and surplus masonry material from the site.

3.11 WATER REPELLENT APPLICATION

A. Cleaning shall be complete and accepted by the Architect, and wall surfaces shall be thoroughly dry.

B. Apply water repellent in strict accordance with Section 071900 and the water repellent manufacturer's instructions.

END OF SECTION 042200

SECTION 05500

METAL FABRICATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Section includes requirements for provision of Metal fabrications not necessarily limited to the following:
   1. Railing assemblies: guardrails, handrails, handrail brackets and intermediary rails.
   2. Custom fabricated ferrous metal items 16 gage and heavier.
   3. Pipe sleeves, metal connectors, embeds, bolts, plates, and hangers.

1.2 SUBMITTALS

A. Provide shop drawings for all hand railings and structures.

PART 2 – PRODUCTS

2.1 GENERAL: Provide and install items complete in respect to function as intended.

2.2 MATERIALS

A. Structural Steel Shapes Plates Bars And Rods: ASTM A36.
   1. Steel Plates
      a. Low and Intermediate Tensile Strength: ASTM A283.
      b. Normalized High-Strength Low-Allow Structural Steel: ASTM A633.
      c. Steel Sheets and Strip: ASTM A569 and A570.
   2. Steel Sheet
      a. Commercial Quality: ASTM A366.
      b. Structural Quality: ASTM A611.

B. Structural Tube Steel: ASTM A500 and A501. C.

Structural Steel Pipe: ASTM A53, Grade B.

D. Bolts, Nuts and Washers: A307 or A36. E.

Other Metals: Specialty items.

F. Welding Materials: Applicable AWS D1.1, type required for materials being welded. Use E70 welding electrodes for all structural steel welding.

2.3 PAINTING

A. Shop Prime
1. Coatings For Protection of Dissimilar Materials: Bituminous type paint.
2. Primer For Ferrous Metal: Modified alkyd rust inhibitive primer. Tnemec Co Inc.'s "Series 10, P10-99 Red color.

2.4 STANDARD CATALOG PRODUCTS

A. Non-Shrink Grout
1. Combination of metallic aggregates and Portland cement preformulated for job site mixing.
2. Manufacturer: Sullivan Co., "Sulco"; Conrad B. Sovig Co., "Consov Iron Waterproofing"; Master Builders, "Embeco"; Grace Construction Materials, "Vibro-Foil"; or equal.

2.5 FABRICATION

A. Shop Fabrication and Finish Schedule:
1. Painting
a. General
1) Apply prime paint materials in accordance with manufacturer's instructions and recommendations.
2) Permit thorough drying before shipment.
3) Spot paint abrasions and field connections after assembly. b. Galvanizing Repair Paint: Apply paint having minimum dry film thickness of 2 mils.
c. Prime Paint: Apply paint having minimum dry film thickness of 1.5 mils minimum.
d. Bituminous Coating for Protection of Dissimilar Materials: Apply at least two coats, minimum 5 mils total thickness.
e. Finish Painting: As specified in Section 09900.
2. Galvanizing
a. Hot-dip galvanize products after fabrication in accordance with the following, as applicable:
1) ASTM A123.
2) ASTM A153.
3) ASTM A385.
b. Mark galvanized products with the name of the galvanizer, the applicable ASTM designation, and the weight of the zinc coating.
c. Galvanize fabricated items complete, or in the largest practicable sections.
d. Galvanizing shall be at the rate of 2.0 ounces per square foot, minimum.
e. Galvanized items that are to be painted shall be wash-primed within six hours of galvanizing.
f. Touch-up galvanized items with zinc-rich paint as required by the University's Representative..
3. Finish Schedule.
a. Ferrous Metal Interior Items

1) Concealed: Clean, chemically etch and shop-apply one prime coat.
2) Exposed: Clean, treat with hot phosphate, chemically etch, and shop apply one prime-coat.

b. Ferrous Metal, Exterior Items
1) Concealed: Clean and hot-dip galvanize in accordance with galvanizing standards.
2) Exposed
a) Typical: Clean, then hot-dip galvanize in accordance with galvanizing standards, chemically etch and shop- apply one prime-coat.
b) Intermediary rails to be welded as noted.
c) Hardware Including Fasteners (Bolts, Nuts, Washers and Similar Type Items): Finish to match item fastened.

2.6 SOURCE QUALITY CONTROL

A. Inspections: The Owner's Testing Agency will continuously inspect welding in field of fabricated items in accordance with applicable requirements of CBSC CBC Chapter 17A.

PART 3 – EXECUTION

3.1 FIELD QUALITY CONTROL

A. Inspections: The Owner's Testing Agency will continuously inspect welding in field of fabricated items in accordance with applicable requirements of CBSC CBC Chapter 17A.

END OF SECTION

SECTION
05560

MISC. METAL WORK

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Light structural steel framing members and structural steel support members, with required bracing, welding and fasteners.

B. Steel and aluminum, materials for miscellaneous metal fabrications specified in this Section and required but not specified in other Sections.

C. Anchors and fasteners for connection to concrete and steel construction.

D. Shrinkage-resistant grout and grouting of structural framing baseplates, equipment anchors and miscellaneous metal fabrications.

E. Light structural steel framing members and structural steel support members, with required bracing, welding and fasteners.
Ornamental railings and handrails, fabricated from steel stock.
Misc. metal fabrication for signage assembly.

F. Galvanizing of steel products.

G. Shop priming and painting of steel fabrications.

1.2 RELATED SECTIONS

A. Section 03200 - Reinforcing Steel: Placement of embedded products.

B. Section 03300 - Cast in Place Concrete: Materials and methods for grouting of structural members.

C. Section 05400 – Cold-formed Structural Metal Framing.

D. Section 05500 – Metal Fabrications.

E. Section 09900 – Painting: Field priming: field-applied finish or interior metal fabrications.

F. Division 16 – Electrical: Electrical supporting devices: component and equipment anchorage and attachment.

1.3 REFERENCES

A. Aluminum Association (AA):
AA - Standards for Architectural Aluminum.
AA - Designation System for Aluminum Finishes.

B. American Hot Dip Galvanizers Association (AHDGA): Recommended Details for Galvanized Structures.

C. American Institute of Steel Construction (AISC):
AISC Manual of Steel Construction.
AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.

D. American Welding Society (AWS):
AWS D1.1 - Structural Welding Code—Steel.
AWS D1.2 - Structural Welding Code—Aluminum.
AWS D1.3 - Structural Welding Code—Sheet Steel.

E. National Association of Architectural Metals Manufacturers (NAAMM): Metal Finishes Manual.

F. Steel Structures Painting Council (SSPC): SSPC Painting Manual, Volumes 1 and 2.

1.4 SUBMITTALS

A. Product Data: Submit catalog data for all standard production products. B.

Shop Drawings:
Indicate fabrication and installation of metal fabrications, per Section 01300.
Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
Include erection drawings, elevations, and details where applicable.
Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.
For products indicated to comply with certain design loadings, include structural analysis data sealed and signed by a Professional Structural Engineer currently registered to practice in the State of California, who was responsible for their preparation

C. Product Data: Submit catalog data for all standard production products.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Conform to Uniform Building Code (UBC).

B. Fabricator's Qualifications: Fabricator of light structural steel framing members and other miscellaneous metal fabrications of structural character shall be approved by the Building Official in accordance with applicable Code provisions.

C. Welder's Qualifications: Welding shall be performed by certified welders qualified in accordance with procedures specified in the appropriate referenced AWS standard, using materials, procedures and equipment of the type required for the Work. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.

D. Coordination: Provide templates and sleeves for incorporation of embedded items into the work specified elsewhere herein.

E. Field-Verified Dimensions: Prior to fabrication, field verify dimensions and details of construction. Immediately report variances in writing to Architect. Do not proceed with the work until clarification has been received from the Architect.

1.6 QUALITY ASSURANCE

A. Storage, General: Store products in enclosed, well-ventilated spaces, not in contact with soil or vegetation and not subject to inclement weather.

B. Delivery, Storage and Handling, Galvanized Products:
Stack and bundle during transport and store to allow air flow between galvanized surfaces

.

Load for transport to permit continuous drainage should wetting occur.
Do not rest galvanized products on cinders or clinkers.

C. Bundles shall be intact and identified with appropriate and legible labels or tags.

1.7 PROJECT CONDITIONS

A. Field Inspection of Fabricated Products: Prior to installation, inspect products for damage and verify markings and dimensions against reviewed submittals.

B. Environmental Conditions: Do not install products intended for interior locations when spaces are uncovered and unprotected from inclement weather.

C. Coordination: Coordinate metal fabrications Work with Work specified in other Sections so that related Work shall be accurately and properly joined.

PART 2 - PRODUCTS

2.1 HANDRAILS

A. Coordinate with all necessary trades doing adjoining or essential work to assure proper fit and installation for the safety of the users.
Handrails:
Shall be provided by this section, including installation.
Shall be provided by Division 5, including installation.

B. Shop and as-built drawings for approval, coordination and record shall be included as part of the system requirements.
C. All applicable trade standards shall be followed, including basic engineering standards, welding standards and steel construction standards.

2.2 PRODUCTS:

A. Hand Railings:
Pipe handholds must be constructed from 1-1/2 inch I.D. Schedule 40, pipe. Pipe joints, if necessary must be minimized and must use a drive fit pipe sleeve at least eighteen inches long, and secured by plug welds. Attachment to uprights as noted. The pipe must be painted with recognized high quality paint.

Pipe handholds must be constructed from 1-1/2 inch E.D. Schedule 40 pipe.

B. All components to be painted gloss black prior to installation with touchup in the field if necessary.

C. Metal work shall be free of all extraneous markings, scars and abrasion. All edges shall be finished smooth to the touch. Welds shall be executed in accordance with the standards set

by the American Welding Society. Welds shall be ground smooth. Welding shall be completed in a manner so as not to add secondary stresses and created distortion.

2.3 INSTALLATION:

A. Install equipment in accordance with the manufacturer's printed instructions and shop drawings, as indicated.

B. Install system as square, plumb and true to adjacent work.

C. All construction rubbish and spare materials will be removed by this contractor by project completion.

2.6 METAL SIGNAGE:

FABRICATION

A. Fabricate signage from:

1. Rectangular steel bars, angles, and other shapes: ASTM A36 or ASTM A1011 or ASTM A569.

PART 3 - EXECUTION

3.1 EXAMINATION

A. The Contractor shall examine areas and conditions under which the work under this Section is to be installed and shall notify the Owner's Representative in writing of conditions detrimental to proper and timely completion of work.

B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 ERECTION, INSTALLATION, APPLICATION

A. Install equipment securely, complete with bolts, nuts, washers, clips, fittings, supports, and other items required for proper installation and operation.

B. Position items accurately, true to plumb, line and level. Maintain maximum headroom and clearances at all points.

C. Obtain Owner's Representative's prior approval for field welding. Carry out approved field welding in accordance with "Load and Resistance Factor Design" specifications by the AISC.

E. Clean structural steel and fabricated steelwork of rust, scale and foreign matter by grinding; prime with 1 coat primer; finish with 1 coat first quality machinery enamel free of skips, runs and saps. Touch up field connections, welds and abraded places with primer and enamel.

F. Install work in this Section in accordance with the Owner's Representative's direction, specifications, approved shop drawings, pertinent project drawings, established best trade practices and applicable code requirements.

3.3 ADJUSTING AND CLEANING

A. Check, operate and adjust equipment and components, including spare equipment, for performance in accordance with specifications, approved shop drawings, project drawings, and industry standard practice, prior to Demonstration.

B. Touch-up minor abrasions and imperfections as required.

C. Superfluous equipment and materials supplied shall be removed from the area(s) of this work, removed from the job site and disposed of legally at no additional cost to the Owner.

3.4 METAL SIGNAGE - SHOP FABRICATION

A. All required cutting, fitting and welding shall be performed in the manufacturers shop in accordance with the approved shop drawings and shall be in compliance with the NAAMM Metal Bar Grating Manual tolerances and welding standards.

B. The finish coating, paint or galvanizing shall be applied after all of the required fabrication is complete. Steel, unless specified to be galvanized or unpainted, shall have all surfaces painted with one shop coat of manufacturer's standard paint, applied in accordance with the manufacturer's standard practice. One Shop coat of manufacturer's standard paint is design to protect the grating from the elements during transit.

3.5 METAL SIGNAGE INSTALLATION

A. The signage structure shall be received at the job site by the contractor, unloaded and protected from damage prior to the requirement for it to be installed. Signage structure stored at the jobsite shall be covered or under a roof . Required covering is not the responsibility of the fabricator.

B. Prior to structure installation, contractor shall inspect supports for correct size, layout and alignment. Any inconsistencies between contract drawings and supporting structure deemed detrimental to signage placement shall be reported in writing to the architect or owner's agent prior to placement. The installing contractor shall prepare the site for installation, determining that deviations from the approved drawings are corrected prior to signage placement.

C. Preparation: Prior to signage fabrication, field verify required dimensions.

D. Signage structure shall be installed in accordance with the manufacturer's recommendations, and approved shop drawings.

E. Attach signage structure with prescribed hardware as described in the design documents.

F. After installation, touch-up damaged finish with paint supplied by manufacturer and matching original coating.

END OF SECTION

SECTION 16010 - ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Work Included: All labor, materials, appliances, tools, equipment, facilities, transportation and services necessary for and incidental to performing all operations in connection with furnishing, delivery and installation of the work of this Section, complete, as shown on the drawings and/or specified herein. Work includes, but is not necessarily limited to, the following:

1. Examine all other sections for work related to those other sections and required to be included as work under this section.

2. General provisions and requirements for electrical work.

B. Organization of the specifications into divisions, sections and articles, and arrangement of drawings shall not control the CONTRACTOR in dividing the contract work among subcontractors or in establishing the extent of work to be performed by any trade.

1.2 GENERAL SUMMARY OF ELECTRICAL WORK

A. The specifications and drawings are intended to cover a complete installation of systems. The omission of expressed reference to any item of labor or material for the proper execution of the work in accordance with present practice of the trade shall not relieve the CONTRACTOR from providing such additional labor and materials.

B. Refer to the drawings and shop drawings of other trades for additional details which affect the proper installation of this work. Diagrams and symbols showing electrical connections are diagrammatic only. Wiring diagrams do not necessarily show the exact physical arrangement of the equipment.

C. Before submitting a bid, the CONTRACTOR shall become familiar with all features of the building drawings and site drawings which may affect the execution of the work. No extra payment will be allowed for failure to obtain this information.

D. If there are omissions or conflicts between the drawings and specifications, clarify these points with the ENGINEER before submitting bid.

E. Provide work and material in conformance with the manufacturer's published recommendations for respective equipment and systems.

1.3 LOCATIONS OF EQUIPMENT

A. The drawings indicate diagrammatically the desired locations or arrangements of conduit runs, outlets, equipment, etc., and are to be followed as closely as possible. Proper judgment must be exercised in executing the work so as to secure the best possible installation in the available space and to overcome local difficulties due to space limitations or interference of structure conditions encountered.

B. In the event changes in the indicated locations or arrangements are necessary, due to developed conditions in the site construction, such changes made without cost, providing the change is ordered before the conduit runs, etc., and work directly connected to same is installed and no extra materials are required.

C. Coordinate and cooperate in every way with other trades in order to avoid interference and assure a satisfactory job.

D. The locations of the existing utilities, building, equipment and conduit shown on the drawings is approximate. Verify exact locations and routing of existing systems by potholing all trench routes prior to digging the trench. Pothole at least 100 feet ahead of the actual trenching to allow space to alter the new conduit routing to accommodate existing conditions.

E. Underground detection services existing utility structures.

1. Services shall be provided utilizing the latest detection equipment available. (Services available from Schockley & Associates, 714-983-1842 or Linville Engineering, 909-989-3922.) Services shall be performed by a company regularly engaged in the business of existing Underground Utility Structure Detection for the past five years.

2. Prior to excavation the following work shall be performed:

   a. Contractor to mark trenching locations and indicate width and depth.

   b. Locate, by way of vertical and horizontal control dimensions, existing subgrade petroleum product pipes, process piping, conduits, sewer, water, gas, storm drain, electrical, telephone and irrigation lines in the affected areas of contract construction work.

   c. Arrange and meet with the Engineer to review existing underground conditions.

3. Exercise extreme caution in excavating and trenching on this site to avoid existing underground utilities, and to prevent hazard to personnel and/or damage to existing underground utilities or structures. These drawings and specifications do not include necessary components for construction safety which is the responsibility of the Contractor.

4. Repair/replace, without additional cost to the contract, and to the satisfaction of the OWNER any work damaged that was identified in the record drawings provided, noted by the representative, or identified by the Underground Deletion Services performed.

5. The Contractor shall contact Underground Service Alert (USA) of Southern California, 1-800-422-4133, at least 48 hours prior to excavation, and shall not excavate until verification has been received from the USA and that public utilities serving the site have been located and marked.

F. The locations of existing underground utilities, where shown on drawings, are shown diagrammatically and have not been independently verified by the OWNER or Engineer. The OWNER and his Consulting ENGINEERS are not responsible for the location of underground utilities or structures, whether or not shown or detailed and installed under this or any other contracts.

1.4 POWER, TELEPHONE AND OTHER SIGNAL SERVICES

A. Telephone, power, and metering facilities shall conform to the requirements of the serving utility companies. CONTRACTOR shall verify service locations and requirements, and shall pay all costs levied by the serving utility companies for rendering utility services to the contract without additional cost to the OWNER. Service information will be furnished by the serving utilities. Comply with requirements of the OWNER'S telephone supplier.

B. Conform to all requirements of the serving utility companies. Location of power pole and routing of service conduits indicated on the drawings are approximate and shall be verified with the serving utility company prior to installation. Installation of service shall not begin until approved drawings have been received from the serving utility company.

C. Within 30 calendar days of receipt of notice that the contract award has been made, the CONTRACTOR shall notify the New Business Departments of the District Office of the serving utility companies concerning the project contract and shall provide information as to the total lighting, power, telephone, and signal requirements of the contract. The CONTRACTOR shall furnish at the same time information as to the estimated completion date of job or the date when the respective utility company circuits, will be ready for installation, energizing and activation of the service.

D. In addition to the requirements of the serving utility companies, all power, telephone and signal service conduits for utility company circuits, shall be completely encased in concrete on all sides, top and bottom or as required by utility companies. The concrete shall be red mix color and extend a minimum of three inches past the conduit.

1.5 PERMITS

A. Take out and pay for all required permits, inspections and examinations without additional cost to the OWNER.

1.6 QUALITY ASSURANCE

A. Work and materials shall be in full accordance with the latest rules and regulations of

1. California Code of Regulations Title 24.
2. California Part 3 "California Electrical Code" CEC, Title 24 and Title 8 "Division of Industrial Safety".
3. The National Electrical Code.
4. The National Life Safety Code.
5. The International Building Code-IBC.
6. National Fire Protection Agency-NFPA.
7. Underwriter's Laboratory-U.L.
8. Other applicable State and Local Government Agencies Laws and Regulations.

B. All material and equipment shall be new and shall be delivered to the site in unbroken packages. All material and equipment shall be listed and labeled by Underwriters Laboratories or other recognized testing laboratories, where such listings are available. Comply with all installation requirements and restrictions pertaining to such listings.

C. Work and material shown on the drawings and in the specifications are new and included in the contract unless specifically indicated as existing or N.I.C. (not-in-contract).

D. Keep a copy of all applicable codes available at the job site at all times while performing work under this section. Nothing in plans or specifications shall be construed to permit work not conforming to the most stringent of codes.

E. Where a conflict or variation occurs between applicable Codes, the provisions of the most restrictive code shall be the requirement of the Contract Documents. Where a conflict or variation occurs between applicable Codes and the Contract Documents, the requirements of the most restrictive provision(s) shall be the requirement of the Contract Document.

1.7 SUBMITTALS

A. General:

1. Review of CONTRACTOR'S submittals is for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Any action shown is subject to the requirements of the plans and specifications. CONTRACTOR is responsible for quantities; dimensions which shall be confirmed and correlated at the job site; fabrication processes and techniques of construction; coordination of work with that of all other trades and satisfactory performance of their work.

2. The CONTRACTOR shall review each submittal in detail for compliance with the requirements of the contract documents prior to submittal. The CONTRACTOR shall "Ink Stamp" and sign each item of the submittal with a statement "CERTIFYING THE SUBMITTAL HAS BEEN REVIEWED BY THE CONTRACTOR AND COMPLIES WITH ALL THE REQUIREMENTS OF THE CONTRACT DOCUMENTS". The CONTRACTOR shall clearly and specifically identify each individual proposed substitution or proposed deviation from the requirements of the contract documents with a statement "THIS ITEM IS A SUBSTITUTION".

3. Departure from the submittal procedure will result in re-submittals and delays. Failure of the CONTRACTOR to comply with the submittal requirements shall render void any acceptance or any approval of the proposed variation. The CONTRACTOR shall then be required to provide the equipment or method without variation from the contract documents and without additional cost to the contract.

4. The CONTRACTOR at no additional cost or delays to the contract shall replace any work, material and correct any deficiencies resulting from deviations from the requirements of the contract documents not approved in advance to commencement of work by the OWNER.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Submit comprehensive material list, shop drawings and complete technical data for the following equipment and materials:

1. General requirements:

   a. Meter pedestals

   b. Pull boxes

   c. Lighting standards

   d. All lighting lumenaires.

   e. Contactors

2. Special submissions:

   a. Submit computerization plans indicating foot-candle levels for parking areas should "Equals" be requested. Foot-candle level calculations shall be included with fixture shop drawing submittals.

B. Materials List and Shop Drawings:

1. Submit material list and equipment manufacturers for review within 35 days of award of contract. Give name of manufacturer and where applicable, brand name, type and/or catalog number of each item. Listing of more than one manufacturer for any one item of equipment, or listing items "as specified", without both make and model or type designation, is not acceptable. Shop drawings shall not be submitted before review completion of manufacturers list. The right is reserved to require submission of samples of any material whether or not particularly mentioned herein.

2. After completion of review of the material and equipment manufacturers list, submit shop drawings for review. Shop drawings shall be submitted in completed bound groups of materials (i.e., all lighting fixtures or all switchgear, etc.). The CONTRACTOR shall verify dimensions of equipment and be satisfied as to fit and that they comply with all code requirements relating to clear working space about electrical equipment prior to submitting shop drawings for review. Submittals which are intended to be reviewed as substitution or departure from the contract documents must be specifically noted as such or the requirements of the contract documents will prevail regardless of the acceptance of the submittal.

3. Shop drawings shall include catalog data sheets, instruction manuals, dimensioned plans, elevations, details, wiring diagrams and descriptive literature of components parts where applicable. Structural calculations and mounting details, signed by a Structural ENGINEER registered by the State of California, shall be submitted for all equipment weighing over four hundred pounds, and shall be in compliance with Title 21 of the California Code of Regulations.

4. Each shop drawing item shall be identified with the specification section and paragraph numbers, lighting fixture types and drawing sheet numbers, the specific shop drawing is intended to represent. Shop drawings 11" x 17" or smaller in size shall be bound in 3-ring binders. Divider tabs shall be provided in the 3-ring binders identifying and separating each separate shop drawing submittal item. Shop drawings larger than 11" x 17", shop drawing pages/sheets submittals shall be sequentially numbered with unique alphanumeric numbering system to facilitate correspondence referencing identification of individual sheets.

5. Shop drawings shall include the manufacturer's projected days for shipment from the factory of completed equipment, after the equipment is released for production by the CONTRACTOR. It shall be the responsibility of the CONTRACTOR to insure that all material and equipment is ordered in time to provide an orderly progression of the work. The CONTRACTOR shall notify the ARCHITECT of any changes in delivery which would affect the project completion date.

C. The CONTRACTOR shall be responsible for incidental, direct and indirect costs resulting from the substitution of specified contract materials or work.

D. The CONTRACTOR shall pay, upon request by the ENGINEER, $100.00 per hour for the ENGINEER's time involved in the review of substitution submittals and design changes resulting from the CONTRACTOR'S requested substitutions.

E. Maintenance and Operating Manuals

1. The CONTRACTOR shall furnish three copies of typewritten maintenance and operating manuals for all electrical equipment, fire alarm equipment, sound system equipment, etc., to the OWNER.

2. Instruct OWNER'S personnel in correct operation of all equipment at completion of project. Provide a minimum of one (1) two (2) hour duration separate instruction classes for each individual equipment group furnished as part of the contract. Instruction classes shall be presented by Manufacturer's authorized field service ENGINEER at the project site.

3. Maintenance and operating manuals shall be bound in three-ring, hard-cover, plastic binders with table of contents. Manuals shall be delivered to the OWNER with letter of transmittal, carbon copy to the ENGINEER.

F. Portable or Detachable Parts: The CONTRACTOR shall retain in his possession, and shall be responsible for all portable and detachable parts or portions of the installation such as fuses, keys, locks, adapters, locking clips, and inserts until final completion of contract work. These parts shall then be delivered to the OWNER or Engineer and an itemized receipt obtained, with copies of receipt sent to the ENGINEER.

G. Record Drawings

1. Provide and maintain in good order a complete set of electrical contract "record" prints. Changes to the contract to be clearly recorded on this set of prints. At the end of the project, transfer all changes to one set of transparencies to be delivered unfolded to the ENGINEER.

2. The actual location and elevation of all buried lines, boxes, monuments, vaults, stub-outs and other provisions for future connections shall be referenced to the building lines or other clearly established base lines and to approved bench marks. If any necessary dimensions are omitted from the record drawings, the CONTRACTOR shall, at his own expense, do all excavation required to expose the buried work and to establish the correct locations.

3. The CONTRACTOR shall keep the "record" prints up to date and current with all work performed.

PART 3 - EXECUTION

3.1 CLEANING EQUIPMENT, MATERIALS, PREMISES

A. All parts of the equipment shall be thoroughly cleaned of dirt, rust, cement, plaster, etc., and all cracks and corners scraped out clean. Surfaces to be painted shall be carefully cleaned of grease and oil spots and left smooth, clean and in proper condition to receive paint finish.

3.2 JOB CONDITIONS – PROTECTION

A. Protect all work, materials and equipment from damage from any cause whatever and provide adequate and proper storage facilities during the progress of the work. Provide for the safety and good condition of all the work until final acceptance of the work by the OWNER and replace all damaged or defective work, materials and equipment before requesting final acceptance.

3.3 EXCAVATION, CUTTING, BACKFILL AND PATCHING ADDITIONAL REQUIREMENTS

A. General:

1. Perform excavation, cutting, backfill and patching of the construction work required for the proper installation of the electrical work.

2. Patching shall be of the same material, thickness, workmanship and finish as existing and accurately match surrounding work to the satisfaction of the ENGINEER.

B. Excavation Temporary cover

1. Excavations for contract work occurring in streets, vehicular drive areas, parking lots, sidewalks or any paved surface; provide temporary steel plating and shoring support for the plates, to completely cover the excavations under one or more of the following conditions:

a. Excavation shall not remain "open" for more than four (4) calendar days; provide temporary plating.

b. Excavation shall not be "open" over weekends (Saturday, Sunday) or Holidays, provide temporary plating.

2. The temporary steel plating shall be a minimum of 0.75-inch thickness, but in no case shall the thickness be less than required to support AASHO-H20 traffic loading.

3. Provide a minimum of two (2) 100% open lane(s) (10 ft. width) for vehicular traffic at all times during construction, for vehicle access to all areas.

3.4 IDENTIFICATION

A. Equipment Nameplates

1. Panelboards, terminal cabinets, circuit breakers, disconnect switches, relays, time switches, contactors, pushbutton control stations, and other apparatus used for the operation or control of feeders, circuits, appliances, or equipment shall be properly identified by means of descriptive nameplates or tags permanently attached to the apparatus and wiring.

2. Nameplates shall be engraved laminated phenolic. Shop drawings with dimensions and format shall be submitted to the ENGINEER before installation. Attachment to equipment shall be with escutcheon pins, rivets, self-tapping screws or machine screws. Self-adhering or adhesive backed nameplates shall not be used.

3. Provide black-on-white laminated plastic nameplates engraved in minimum 1/4" high letters to correspond with the designations on the drawings. Provide other or additional information on nameplates where indicated.

B. Wire and Cable Identification

1. Provide identification on individual wire and cable including sign systems, electrical power systems (each individual phase, neutral and ground), empty conduit pull ropes, and control circuit.

2. Identification shall be provided at each termination location, splice location, pullbox, junction box and equipment enclosure.

a. Individual wire and cable larger than #6 AWG or 0.25 inch diameter, shall be provided with polypropylene identification tag holders, with yellow polypropylene tags interchangeable black alpha/numeric characters. Character height 0.25 inch as manufactured by Almetek Industries "EZTAG" series. Attach identification tags with plastic "tie" wraps, minimum of two for each tag.

b. Individual wire and cable #6 AWG and smaller or smaller than 0.25 inch diameter, shall be provided with water and oil resistant, flexible, pressure sensitive machine embossed plastic tags that wrap a minimum of 360 degrees around the wire/cable diameter. The entire tag shall then be covered with a clear flexible waterproof plastic cover wrapped a minimum of 540 degrees around the wire/cable diameter and completely covering the identification.

c. Each identification tag location shall indicate the following information: circuit number, circuit phase, source termination and destination termination equipment name (or outlet number as applicable).

3. Install identification after installation/pulling of wire/cable is complete, to prevent loss or damage to the identification.

C. Cardholders and cards shall be provided for circuit identification in panelboards. Cardholders shall consist of a metal frame retaining a clear plastic cover permanently attached to the inside of panel door. List of circuits shall be typewritten on card. Circuit description shall include name or number of circuit, area, and connected load.

D. Junction and pull boxes shall have covers stenciled with box number when shown on the drawings, or circuit numbers according to panel schedule. Data shall be lettered in a conspicuous manner with a color contrasting to finish.

3.5 TESTING

A. The CONTRACTOR shall obtain an independent testing laboratory that will provide all instrumentation and tests on the electrical system and equipment as hereinafter described and further directed by the ARCHITECT. The test shall be performed after the completion of all electrical systems included in the Contract Scope of Work. All tests shall be recorded and documented and submitted to the ENGINEER for review.

1. Test for Phase to Ground and Neutral Condition:

   a. Open main service disconnect.

   b. Isolate the system neutral from ground by removing the neutral disconnect link located in the service switchboard.

   c. Close all submain disconnects.

   d. Close all branch feeder circuit breakers.

   e. Turn all switches to "on" position, unplug all portable equipment from outlet receptacles.

   f. Measure the resistance of each phase to ground and phase to neutral. A properly calibrated "megger" type test instrument shall be used. The test voltage shall be nominal 500 volts.

   g. Record all readings after one minute duration and document into a complete report.

2. Isolating Grounds: In the event that low resistance ground neutral connections are found in the system, they shall be isolated and located by testing each circuit individually as outlined above. Make proper corrections to restore the resistance values to an acceptable value.

B. Method of obtaining ground resistance shall be in accordance with the latest edition of the James G. Biddle (Plymouth Meeting, Pennsylvania) manual published on this subject.

1. Perform "fall-of-potential" tests on the main grounding electrode of system per IEEE Standard No. 81, Section 8.2.1.5. When suitable locations for test rods are not available, a low resistance dead earth or reference ground shall be utilized.

2. Perform the two-point method test per IEEE Standard No. 81, Section 8.2.1.1, to determine the ground resistance between the main grounding system and all major electrical equipment frames, system neutral, and/or derived neutral points.

C. All equipment and personnel required for testing shall be furnished by the CONTRACTOR.

D. The Contractor shall complete the following work before any electrical equipment is energized:

1. All equipment shall be permanently anchored.

2. All bus connections shall be tightened per manufacturer's instructions and witnessed by the Engineer.

3. All ground connections shall be completed and identified. Perform and successfully complete all required megger and ground resistance tests.

4. All feeders shall be connected and identified.

5. The interiors of all electrical enclosures including busbars and wiring terminals shall be cleaned of all loose material and debris, paint, plaster, cleaners or other abrasive's overspray removed and equipment vacuumed clean. The Engineer shall observe all interiors before covers are installed.

6. All dry wall work and painting shall be completed within areas containing electrical equipment prior to installation of equipment.

7. All doors to electrical equipment rooms shall be provided with locks in order to restrict access to energized equipment.

8. Electrical rooms shall not be used as storage rooms after power is energized.

3.6 POWER OUTAGES

A. All electrical services in all occupied facilities of the contract work are to remain operational during the entire contract period. Any interruption of the electrical services for the performance of this work shall be at the convenience of the OWNER and performed only after consultation with the OWNER. Work involving circuit outages shall be only at such a time and of such a duration as approved in writing. Work involving circuit outages for the work required to connect new equipment and disconnect existing equipment shall be performed at the convenience of the OWNER.

B. Provide overtime work; double shift work; night time work; Saturday, Sunday, and holiday work to meet outages schedule.

C. Provide temporary electrical power to meet the requirements of this Article.

D. Any added costs to CONTRACTOR due to necessity of complying with this Article shall be included in the Contract Scope of Work.

E. When electrical work involving power disruptions to existing areas is initiated, the work shall proceed on a continuous basis without stopping until electric power is restored to the affected areas.

F. The CONTRACTOR shall request in writing to the OWNER a minimum of three weeks in advance, for any proposed electrical outage.

3.7 TEMPORARY ELECTRICAL POWER

A. Provide temporary electrical power if work requiring power outages cannot be completed in time permitted and approved by the OWNER.

B. Temporary electrical power shall be a standby diesel engine generators. Voltage, frequency, regulation, etc. shall be equal to that of normal utility source. Exhaust system shall have a critical silencing muffler. Generator voltage shall match the existing secondary voltage required at the site. The CONTRACTOR shall furnish all necessary cables, switches, etc. to make all required connections to existing panels, feeders, etc. Generator shall be sized to adequately carry the demand load. If record of demand load is not available, size generator to match corresponding transformer capacities and as directed by the ENGINEER.

C. After completion of required usage of the temporary generators, prior to completion of the project, the CONTRACTOR shall remove the generators. All temporary cables, switches, etc. shall be removed and all permanent equipment left in satisfactory condition.

D. Each generator shall be housed in security type sound attenuated housing to prevent access by unauthorized personnel. Temporary power cables, connections, etc. shall be protected from unauthorized personnel.

E. The CONTRACTOR shall be responsible for complete operation of the generator including personnel, fuel supplies, proper safety precautions, etc. Generator shall not be left unattended while in operation.

F. The CONTRACTOR shall provide temporary construction lighting and power as required in areas where work is being performed. Temporary power arrangements, outages, installation, work schedules, etc., shall be submitted in writing three weeks prior to requested outage date, and approved by the OWNER prior to start of work.

3.8 ASBESTOS, POLYCHLORINATED BIPHENYL (PCB) OR HAZARDOUS WASTE

A. It is understood and agreed that this contract does not contemplate the handling of asbestos, PCB or any hazardous waste material. If asbestos, PCB or any hazardous waste material is encountered, notify the OWNER immediately. Do not disturb, handle or attempt to remove.

3.9 SERIES RATED EQUIPMENT

A. Circuit protective Devices identified as "Series Rated" or "Current Liming" (i.e. CLCB - current limiting circuit breaker; CLF - current limiting fuse, etc.) shall be series rated and tested (UL 489 & CSA5) by the manufacturer with all equipment and circuit protective devices installed down stream of the identified series rated or current limiting device. Provide nameplates on all equipment located down stream, including the CLCB and CLF devices, to comply with N.E.C. paragraphs 110-22 and 240-83 "CAUTION SERIES RATED SYSTEM - NEW DEVICE INSTALLATIONS AND REPLACEMENTS SHALL BE THE SAME MANUFACTURER AND MODELS".

3.10 INDEPENDENT TESTING LABORATORY

A. The Testing Laboratory shall meet Federal OSHA criteria for accreditation of Testing Laboratories Title 29 Part 1907. Membership in the National Electrical Testing Association shall constitute proof of meeting said criteria.

3.11 SPARE FUSES

A. Provide three (3) spare fuses to match the installed fuses where the fuses are provided as part of the Contract. Provide spare fuse holders on inside door of each respective fuse compartment. Provide engraved nameplate on front of fuse access door indicating fuse type/catalog number ampere rating and manufacturer of fuse.

3.12 EQUIPMENT SEISMIC REQUIREMENTS

A. Equipment supports and anchorage's provided as part of the contract shall be designed, constructed and installed in accordance with the earthquake regulations of the California Code, Title 24, Section 2312, and the Uniform Building Code (UBC).

B. Provide equipment anchorage details, coordinated with the equipment mounting provision, prepared, signed and "stamped" with PE registration by a civil or structural engineer licensed as a Professional Engineer (PE) in the State of California.

C. Mounting recommendations shall be provided by the manufacturer based upon approved shake table tests used to verify the seismic design of that type of equipment.

D. The equipment manufacturer shall certify that the equipment can withstand, and function following the seismic event, including both vertical and lateral required response spectra as specified in California Title 24 and the UBC. Alternatively, the manufacturer's certification may be based on an approved detailed structural analysis of the assembly, as specified in California Title 24 and the UBC.

E. The equipment manufacturer shall document the details necessary for proper seismic mounting, anchorage, and bracing of the equipment for back installation location.

F. Seismic qualification shall be considered achieved when the capability of the provided equipment, as described by the test response spectra, meets or exceeds the required response spectra as specified in California Title 24 and the UBC, for all equipment natural frequencies up to 35 HZ.

G. The seismic requirements are typical for each equipment item exceeding 100 pounds, including but not limited to the following:

1. Switchgear.
2. Equipment racks.
3. Panels.
4. Conduits with ceiling or wall support suspension attachments.
5. Lighting equipment.

3.13 ELECTRICAL WORK CLOSEOUT

A. Prepare the following items and submit to the ARCHITECT before final acceptance.

1. Two copies of all test results as required under this section.
2. Two copies of local and/or state code enforcing authorities final inspection certificates.
3. Copies of record drawings as required under the General Conditions, pertinent Division One Sections and Electrical General Provisions.
4. Two copies of all receipts transferring portable or detachable parts to the OWNER when requested.
5. Notify the ENGINEER in writing when installation is complete and that a final inspection of this work can be performed. In the event any defect or deficiencies are found during this final inspection they shall be corrected to the satisfaction of the ENGINEER before final acceptance can be issued.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. No separate measurement shall be made for the work in this Section.

4.2 PAYMENT

A. No separate payment shall be made for the work in this Section.

END OF SECTION

SECTION 16050 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SUMMARY

A. Work Included: All labor, materials, appliances, tools, equipment, facilities, transportation and services necessary for and incidental to performing all operations in connection with furnishing, delivery and installation of the work of this Section, complete as shown on the drawings and/or specified herein. Work includes, but is not necessarily limited to the following:

1. Examine all other sections for work related to those other sections and required to be included as work under this section.

2. General provisions and requirements for electrical work.

1.2 SUBMITTALS (ADDITIONAL REQUIREMENTS)

A. Submit product data sheets for all outlet boxes, wiring devices, device plates, relays, contactors, timeswitches, and disconnects fuses.

B. Submit detailed shop drawings including dimensioned plans, elevations, details, schematic and point-to-point wiring diagrams and descriptive literature for all component parts for relays, time clocks, and photocells.

C. Submit material list for outlet boxes.

PART 2 - PRODUCTS

2.1 OUTLET AND JUNCTION BOXES

A. Not applicable

2.2 PULL BOXES

A. Sizes as indicated on the drawings and in no case of less size or material thickness than required by the governing code. Exercise care in locating underground pull boxes to avoid installation in drain water flow areas.

1. Type 3 ½ minimum concrete pull boxes: Furnish complete with pulling irons, hot-dip galvanized traffic cover with hot-dip galvanized frame and 4 galvanized cable racks with porcelain blocks. The box to be set on a pea gravel base 12" thick and as large as the bottom. Install a 3/4" by 10' copper clad ground rod for grounding all metal parts. After cables have been pulled and inspected, seal box between cover and frame with a mastic compound similar to Parmagum or Dukseal. Construction equal to prefabricated pull boxes as manufactured by Quikset or Brooks Products. Refer to drawings for size. Provide bead weld on cover to pull box to indicate services within pull box (ie - "480/277-VOLT, 3-PHASE, 4-WIRE ELECTRICAL". Size per NEC.

2.3 SWITCHES

1. Not applicable

2.4 RECEPTACLES

1. Not applicable

2.5 PLATES

1. Not applicable

2.6 VANDALPROOF FASTENINGS

A. Provide approved vandalproof type screws, bolts, nuts where exposed to sight throughout the project. Screws for such items as switch plates, receptacle plates, fixtures, communications equipment, blank covers, wall and ceiling plates to be spanner head stainless steel, tamperproof type. Provide OWNER with six (6) screwdrivers for this type.

2.7 STRUCTURAL AND MISCELLANEOUS STEEL

A. Structural and miscellaneous steel used in connection with electrical work and located out-of-doors or in damp locations, to be hot-dip galvanized unless otherwise specified. Included are underground pull box covers and similar electrical items. Galvanizing average 2.0 ounce per square foot and conform to ASTM A123.

2.8 FLASHING ASSEMBLIES

1. Not applicable

2.9 RELAYS, CONTACTORS, AND TIMESWITCHES

A. Individual Control Relays – meter pedestals

1. Individual control relays shall have convertible contacts rated a minimum of 10 amperes, 600 volts regardless of usage voltage. Coil voltage, number and type of contacts shall be verified and supplied to suit the specific usage as shown in the wiring diagrams and/or schedules on the electrical and mechanical drawings. Coil control circuit shall be independently fused, sized to protect coil. Relays shall be installed on prefabricated mounting strips. Each relay shall have a surge suppressor to limit coil transient voltages. Furnished in the NEMA Type I enclosure unless indicated otherwise.

2. The following relays are approved:

Manufacturer	Type
Arrow Hart	IMP
General Electric	Class CR 2811
I.T.E.	Class J10
Square D Co.	Class 8501, Type A
Westinghouse	Bul. 16-321, Type NH
Allen Bradley	Approved Equal

B. Contactors and/or Relays

1. Contactors and/or relays for control of lighting shall be 600 volt A.C., electrically operated, mechanically held units, open type for panel mounting with number of poles and of size as indicated on the drawings. Provide auxiliary control relay for operation of each contactor and/or relay with a two-wire control circuit.

2. Contactors and/or relays shall be mounted in meter pedestal as called for on the drawings. Contactors and/or relays shall be Automatic Switch Co. Bulletin #920 Series for 2 and 3 pole, Automatic Switch Co. Bulletin 917 Series with poles as indicated on drawings. Coil control circuit shall be independently fused, sized to protect coil.

3. Contactors and/or relays shall be equipped with a switch, for manual override. Control circuit switch shall be labeled showing function of device.

4. Verify control voltage prior to ordering.

C. Timeswitches

1. All timeswitches shall be 4-channel, 7-day digital control with battery back-up. Tork #Z400B or equal by Paragon.

2. Timeswitches be equipped with a switch, for manual override. Control circuit switch shall be labeled showing function of device.

3. Verify control voltage prior to ordering.

2.10 DISCONNECTS (SAFETY SWITCHES)

1. Not applicable

2.11 CONCRETE WORK

A. See specification section 12-03300 for concrete.

B. Reinforcement:

1. Bars: Intermediate Grade Steel conforming to ASTM A15-66, with deformations conforming to ASTM A305-65, except #2 bars shall be plain.

2. Welded Wire Fabric: ASTM A185-64.

3. Bending: Conform to requirements of ACI 318-63.

C. Form Material: For exposed work, use PS 1-66 "B-B Concrete Form" plywood forms, or equal. Elsewhere, forms may be plywood, metal, or 1" x 6" boards. Forms for round lighting pole bases shall be sono-tube.

PART 3 - EXECUTION

3.1 GROUNDING (ADDITIONAL REQUIREMENTS)

A. Grounding shall be executed in accordance with all applicable codes and regulations, both of the State of California and local authorities having jurisdiction.

B. Each pull box or any other enclosure in which several ground wires are terminated shall be equipped with a ground bus secured to the interior of the enclosure. The bus shall have a separate lug for each ground conductor. No more than one conductor shall be installed per lug.

C. The maximum resistance to ground shall not exceed 5 ohms.

3.2 OUTLET AND JUNCTION BOXES

1. Not applicable

3.3 CONCRETE WORK

A. Form

1. Space forms properly with spreaders and securely tie together. Do not use twisted wire form ties. Keep forms wet to prevent joints from opening up before concrete is placed. Replace improper construction as directed. Do not use wood inside forms.

2. Build in and set all anchors, dowels, bolts, sleeves, iron frames, expansion joints and other materials required for the Electrical Work. Place all items carefully, true, straight, plumb, and even.

3. Carefully remove all exposed forms. Cut nails and tie wires below face of concrete and fill all holes. Rubbish will not be allowed to remain in, under, or around concrete.

B. Mixing: Use batch machine mixer of approved type. After ingredients are in mixer, mix for at least 1-1/2 minutes.

C. Transit Mixing: In lieu of mixing at site, transit mixing may be used if rate of delivery, haul time, mixing time, and hopper capacity is such that concrete delivered will be placed in forms within 90 minutes from time of introduction of cement and water to mixer.

D. Placing of Concrete:

1. Before placing concrete, remove wood, rubbish, vegetable matter and loose material from inside forms. Thoroughly wet down wood forms to close joints.

2. Clean reinforcement, remove paint, loose rust, scale and foreign material. Bars with bends not called for will be rejected. Hold securely in place to prevent displacement. Lap bar splices 24 diameters, min; lap fabric one mesh min. Tie intersections, corners, splices with 16 ga. annealed wire, or as otherwise called for.

3. Place concrete immediately after mixing. Do not use concrete that has begun to set; no tempering will be allowed. If chuting is used, avoid segregation. In placing new concrete against existing concrete, use bonding agent per manufacturer's directions.

4. Give careful and thorough attention to curing of concrete. Keep concrete and forms wet for a minimum of 10 days, after placing concrete.

E. Concrete Finish:

1. Finish of Exposed Concrete: Horizontal surfaces, steel troweled monolithic finish; vertical surfaces, smooth and free of fins, holes, projection, etc.

2. Exposed lighting pole bases shall be filled and sack finished to a smooth finish.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Wiring devices including outlet boxes, device plates, relays, contactors and disconnects shall be measured by the unit or fraction thereof installed in accordance with the Contract Documents and as measured by the Engineer. The quantities as contained on the Schedule of Quantities and Prices or approved Schedule of Values as derived from the plans will be used as the basis for this measurement.

B. Pullboxes shall be measured by the unit or fraction thereof installed in accordance with the Contract Documents and as measured by the Engineer. The quantities as contained on the Schedule of Quantities and Prices or approved Schedule of Values as derived from the plans will be used as the basis for this measurement.

4.2 PAYMENT

A. Wiring devices including outlet boxes, device plates, relays, contactors and disconnects constructed in accordance with the Contract Documents will be paid for at the Contract Unit Price as listed in the Schedule of Quantities and Prices. This price shall be full compensation for furnishing all labor, materials, tools, equipment, supplies, supervision, and incidentals necessary for Wiring devices including outlet boxes, device plates, relays, contactors and disconnects described by the Contract Documents.

B. Pullboxes constructed in accordance with the Contract Documents will be paid for at the Contract Unit Price as listed in the Schedule of Quantities and Prices. This price shall be full compensation for furnishing all labor, Materials, tools, equipment, supplies, supervision, and incidentals necessary for Pullboxes described by the Contract Documents.

Item No.	Description	Pay Unit
16-00500.01	TYPE 3 PULL BOX-ELECTRICAL	Each
16-00500.01	CONCRETE PARKING LIGHT BASE -ELECTRICAL	Each

END OF SECTION

SECTION 16110 - CONDUIT AND WIRE

PART 1 - GENERAL

1.1 SUMMARY

A. Work Included: All labor, materials, appliances, tools, equipment, facilities, transportation and services necessary for and incidental to performing all operations in connection with furnishing, delivery and installation of the work of this Section, complete as shown on the drawings and/or specified herein. Work includes, but is not necessarily limited to the following:

1. Examine all other sections for work related to those other sections and required to be included as work under this section.

2. General provisions and requirements for electrical work.

1.2 SUBMITTALS (ADDITIONAL REQUIREMENTS)

A. Submit product data sheets for all wire, supports, conduit, fittings and splicing materials and wiring devices.

B. Submit material list for all conduit and conduit fittings.

C. Submit details and structural engineering calculations for conduit support systems.

PART 2 - PRODUCTS

2.1 RACEWAYS AND CONDUITS

A. General

1. The interior surfaces of conduits and fittings shall be continuous and smooth, with a constant interior diameter. Conduits and conduit fittings shall provide conductor raceways of fully enclosed circular cross section. The interior surfaces of conduits and fittings shall be without ridges, burrs irregularities or obstructions. Conduits and fittings of the same type shall be of the same uniform weight and thickness.

2. Type of conduit, type of conduit fittings and conduit supports shall be suitable for the conditions of use and the conditions of location of installation, based on the manufacturer's recommendations and based on applicable codes.

B. Rigid Non Metallic Conduit (RNMC)

1. General

a. Conduit and fittings shall be 90 degree centigrade conductor rated. Fabricated from homogeneous material, free from visible cracks holes or foreign inclusions, with integral "end-bell". The conduit and conduit fittings shall be watertight and airtight.

b. Conduit, conduit fittings and conduit fitting assembly "solvent cement" shall all be the product of the same manufacturer. Conduit fittings shall be solvent cement welded watertight.

c. Conduit and fittings shall be identified with legible markings showing ratings, size and manufacturer's name.

d. RNMC and fitting shall be corrosion resistant, watertight.

e. Conduit shall be suitable for conductor operating temperatures from minus 20 degrees centigrade to 90 degrees centigrade.

f. RNMC shall comply with NEMA TC-2 (PVC 40 conduit, latest revision) NEMA TC-6 (EB conduit latest revision) and NEMA TC-3 (fittings, latest revision); UL 514 and UL 651 (latest revision).

2. Polyvinyl Chloride (PVC)-RNMC

a. PVC-schedule 40 heavy wall construction.

2.2 CONDUIT SUPPORTS

A. Not applcable

2.3 WIRE AND CABLE

A. All wire and cable shall be copper, 600 volt, #10 AWG minimum unless specifically noted otherwise on the drawings. Conductors #10 AWG and smaller shall be solid. Conductors #8 AWG and larger shall be stranded. Type of insulation as noted on drawings as follows: Insulation of conductor connected to circuit protection devices required to be "100%" rated, shall be 90 degree rated insulation:

1. Type THHN/THWN insulation used for #4 AWG and smaller.

2. Type THW/XHHW or THHN/THWN insulation used for #2 AWG and larger.

3. Type THW or XHHW insulation used for all panel feeders switchboard feeders, motor control center feeders, transformer feeders and service conductors.

4. Type THHN insulation used for circuit conductors installed in fluorescent lighting fixture raceways, for conductors connected to the secondary of metal halide fixture ballast or other hot locations.

5. Type XHHW or THWN insulation shall be used where conductors are installed in conduit exposed to the outdoor weather.

6. The following color code for branch circuits:

a. Neutral . . . . White (Tape feeder neutrals with white tape near connections)

b. Normal Power

240/120 Volt
Ground: Green
Phase A: Black
Phase B: Red
Phase C: Blue

7. Feeders identified as to phase or leg in each panelboard with printed identifying tape.

PART 3 - EXECUTION

3.1 TRENCHING, FOOTINGS, SLEEVES

A. Provide trenching, concrete encasement of conduits, backfilling, and compaction for the underground electrical work, in accordance with applicable sections of this specification.

B. Provide footings for all post and/or pole-mounted lighting fixtures: concrete shall conform to the applicable sections of this specification.

3.2 GROUNDING

A. Grounding shall be executed in accordance with all applicable codes and regulations, both of the State of California and local authorities having jurisdiction.

B. Where nonmetallic conduit is used in the distribution system, the CONTRACTOR shall install the proper sized copper ground wire in the conduit with the feeder for use as an equipment ground. The electrical metallic raceway system shall be grounded to this ground wire.

C. The maximum ground/bond resistance to the grounding electrode shall not exceed 1 ohms from any location in the electrical system. The maximum ground resistance of the grounding electrode to earth shall not exceed 5 ohms.

D. Ground/Bond Conductors

1. Provide an additional, dedicated, green insulation equipment ground/bond wire inside each conduit type as follows. The metal conduit shall not be permitted to serve (function) as the only (exclusive) electrical ground return path:

   a. All types of nonmetallic conduit raceways including but not limited to: RNMC - Rigid Nonmetallic Conduit.

   b. FMC - Flexible Metal Conduit.

   c. LTFMC - Liquid Tight Flexible Metal Conduit.

2. The equipment ground/bond wire shall be continuous from the electrical circuit source point of origin to the electrical circuit end termination utilization point as follows:

   a. Every conduit path containing any length of the above identified conduits.

   b. Every conduit path connected to any length of the above identified conduits.

3. The equipment ground/bond wire shall be sized as follows, but in no case smaller than indicated on the drawings. Install equipment ground/bond wire in each conduit/raceway, with the respective phase conductors:

Feeder, Subfeeders & Branch Circuit Protection	Minimum Equipment Ground Wire Size
15 Amp	#12
20 Amp	#12
30 to 50 Amp	#10
70 to 100 Amp	#8
101 to 200 Amp	#6
201 to 400 Amp	#2

4. Splices in ground/bond wires shall be permitted only at the following locations:

   a. Ground buses with listed and approved ground lugs.

   b. Where exothermic welded ground/bond wire splices are provided.

5. Provide ground/bond wire jumpers for conduit fittings with ground lugs, expansion and deflection conduit fittings and to bond metal enclosures to conduit fittings with ground lugs.

E. Where conductors are run in parallel in multiple raceways, the grounding conductor shall be run in parallel. Each parallel equipment grounding conductor shall be sized on the basis of the ampere rating of the overcurrent device protecting the circuit conductors in the raceway. When conductors are adjusted in size to compensate for voltage drop, grounding conductors, where required, shall be adjusted proportionately in size.

F. Ground conductors for branch circuit wiring shall be attached at each outlet to the back of the box using drilled and tapped holes and washer head screws, 6-32 or larger.

G. Each panelboard, switchboard, pull box or any other enclosure in which several ground wires are terminated shall be equipped with a ground bus secured to the interior of the enclosure. The bus shall have a separate lug for each ground conductor. No more than one conductor shall be installed per lug.

3.3 CONDUIT

A. General

1. The sizes of the conduits for the various circuits shall be as indicated on the drawings, but not less than the conduit size required by code for the size and quantity of conductors to be installed in the conduit.

2. Conduits shall be installed concealed from view. Install conduits concealed in walls, concealed in/below floors and concealed above ceilings, except as specifically noted otherwise.

3. Conduits shall be provided complete with conduit bends, conduit fittings, outlet boxes, pullboxes, junction boxes, conduit anchors/supports, grounding/bonding for a complete and operating conductor/wire raceway system.

4. Metal and nonmetal conduits shall be provided mechanically continuous between termination connection points. Metal conduit shall be provided electrically continuous between termination connection points.

5. Individual conduits paths and home runs shown on the drawings shall be maintained as separate individual conduits for each homerun and path.

6. Transitions between conduits constructed of different materials and occurring in above grade locations shall be allowed only at outlet boxes, junction boxes, pull boxes and equipment enclosures unless specifically indicated otherwise. Provide outlet boxes and junction boxes.

7. Metal conduit terminating to nonmetal enclosures and terminating into metal enclosures with "concentric.ring" knockouts; including but not limited to equipment housings, outlet boxes, junction boxes, pull boxes, cable trenches, manholes, shall be provided with a ground/bonding lug integrated with the conduit termination conductor fitting construction, by the fitting manufacturer. The lug shall provide for connection of a grounding/bonding conductor (insulated or uninsulated). The grounding lug shall be located on the fitting, inside the termination enclosure.

8. The type of conduit, type of conduit fittings, and type of conduit supports and method of conduit installation shall be suitable for the conditions of use and conditions of location of installation based on the manufacturer's recommendations; based on the applicable codes and based on the requirements of the contract documents.

9. Conduit Separation:

a. Conduit installed underground or below building slab without full concrete encasement shall be power to power, control to control etc.) by a minimum of 3 inches.

b. Conduit installed underground with full concrete encasement; shall be separated from adjacent conduits of similar systems (100 volt and less) by a minimum of 2 inches; conduits

c. Separation of conduits entering termination points or crossing other conduits may be reduced as required within 60 inches of the termination or crossing points.

d. Conduits containing Utility Company service circuits (i.e. electrical power, telephone, or cable television) shall be separated a minimum of 12 inches from all other utilities and conduits, with or without concrete encasement; metallic or non-metallic conduit, above grade or underground conduit locations. Verify with serving utility companies.

e. Conduits shall be separated from hot water piping, exhaust flues/chimnies, steam piping, boilers, furnaces, ovens by a

10. Conduit Concrete Encasement

a. Conduits less than minimum depth required by code shall be concrete encased to provide mechanical protection. Concrete for encasement of underground conduits shall be 2000 PSI 28 days cure strength with a maximum of 3/4" gravel. Concrete encasement of conduits shall be continuous without voids. The encasement shall extend 3-inches past the edges of all conduits on all sides of the circuit. Provide ten pounds of red oxide cement coloring uniformly mixed with each cubic yard of concrete for conduit encasement.

11. Underground Conduits

a. Three or more underground conduits larger than 1" in size and occupying the same trench shall be separated and supported on factory fabricated, non-metallic, duct/conduit support spacers. The spacers shall be modular, keyed interlocking type, "built-up" to accommodate quantity, size orientation and spacing of installed conduits. The spacers shall maintain a constant distance between adjacent conduit supports and hold conduits in place during trench backfill operations. Minimum support spacer installation interval along with length of the conduits shall be as follows:

1) Concrete encased conduits, not less than 8 ft. on center.

2) Non-concrete encased conduits, not less than 5 ft. on center.

b. Provide trenching, excavation, shoring and Backfilling required for the proper installation of underground conduits.

c. Bottoms of trenches shall be cut parallel to “finish grade” elevation. Make trenches 12 inches wider than the greatest diameter of the conduit.

d. Backfilling Trenches for Conduits

1) Conduits which are not concrete encased and are located exterior to building slab shall be set on a 3 inch bed of damp sand. Conduit trenches shall be backfilled to within 12 inches of finished grade with damp sand after installation of conduit and concrete is completed. Remainder of backfill shall be native soil. Soil shall have no stones or aggregate greater than 3". Backfill shall be machine vibrated in 6 inch lifts to provide not less than 90 percent compaction. Provide a continuous yellow 12 inch wide flat plastic tracer tape, located 6 inches above the conduits in the trench. The tracer tape shall be imprinted with "Warning-Electric Circuits" a minimum of 24 inches on center.

2) Do not backfill until installation has been approved by City Inspector and as-built drawings are up to date. Promptly install conduits after excavation has been done, so as to keep the excavations open as short a time as possible. Excess soil from trenching shall be removed from the site.

e. Install underground conduit, except under buildings, not less than 24" below finished grade. Dimensions shall be measured to the top of the conduit.

f. Provide long radius horizontal bends (minimum radius of 36 times the conduit diameter) in underground conduits where the conduit is in excess of 100 feet long.

g. Conduits installed below grade and on grade below buildings, shall not be smaller than 0.75 inches.

h. Underground conduits entering a building shall be sloped. The conduit direction of slope shall be away from the building, and shall prevent water in the conduit from "gravity draining" towards the building. The conduit slope "high point" shall originate from the building, out to the first exterior pullbox, manhole etc. exterior conduit termination "low point". The minimum slope angle shall be a constant 8 inches (or greater) of fall for each 100 feet of conduit length.

i. Dewatering

1) Provide pumping to remove, maintain and dispose of all water entering the excavation during the time the excavation is being prepared, for the conduit laying, during the laying of the conduit, and until the backfill at the conduit zone has been completed. These provisions shall apply on a continuous basis. Water shall be disposed of in a manner to prevent damage to adjacent property. Trench water shall not be drained through the construction. Groundwater shall not be allowed to rise around the pipe until joining compound has firmly set.

2) The Owner shall be notified 48 hours prior to commencement of dewatering.

12. Raceway/Conduits which are installed at this time and left empty for future use shall have 0.25 inch diameter polyvinyl rope left in place for future use. The pull rope shall be 500 pound minimum tensile strength. Provide a minimum of 5 feet of slack at each end of pull ropes.

13. Unless otherwise restricted by structural drawings and specifications, the maximum size conduit permitted in slabs, walls ceilings and roofs constructed of masonry or concrete shall not be greater than 25 percent of the concrete/masonry thickness. Conduits installed in these locations shall not cross.

14. Conduit Bends and Offsets

a. The minimum bend radius of "factory or field" fabricated conduit bends shall not be less than the following. The bend radius shall be measured at the surface, inside radius of the conduit wall.

1) RNMC conduit - conduit minimum bend radius 36 times the conduit inside diameter.

2) Conduits for utility company conductors. Conduit minimum bend radius shall comply with the respective utility company requirements.

b. Bends and offsets in conduits shall be kept to an absolute minimum. The total summation of all bends and offsets permitted in a conduit segment, occurring between two conduit termination/connection end points, shall not exceed the following, including conduit fittings:

1) RNMC conduit - 270 angular degrees

c. Each field fabricated conduit offset, bend and elbow which are not the standard product of the raceway/conduit manufacturer shall be mandrel tested. The test shall be conducted after the conduit installation is complete and prior to pulling-in any wire, in the same manner as for underground conduits.

d. Factory manufactured angle connector conduit fittings shall be installed in exposed conduit locations only. Installation in locations normally concealed from view shall not be permitted. Not more than one (1) factory manufactured angle connector shall be permitted in any length of conduit between conduit termination end points.

e. If (3) three or more conduit-bends of the same conduit size and same conduit material type, installed, as part of the contract work, fail to comply with the required minimum conduit bend radius or conduit angular degree limits. The following corrective actions shall occur:

1) The CONTRACTOR shall remove all the non-complying conduit bends and the respective wire in the conduit from the project site. Provide new conduit and wire, complying with the contract documents.

2) Where the conduit bends similar to the non-complying conduit bends are installed concealed in walls, floors, above ceilings or below grade, the Contractor shall expose the conduit bends to allow visual observation.

3) All the costs to correct the deficient material and work along with costs to repair the direct, indirect, incidental damages and contract delays shall be the sole responsibility of the CONTRACTOR and shall be included in the bid price.

3.4 WIRE AND CABLE

A. Branch circuit and fixture joints for #10 AWG and smaller wire shall be made with UL-approved connectors listed for 600 volts, approved for use with copper and/or aluminum wire. Connector to consist of a cone-shaped, expandable coil spring insert, insulated with a nylon shell and 2 wings placed opposite each other to serve as a built-in wrench or shall be molded one-piece as manufactured by 3M-"Scotchlok".

B. Branch circuit joints of #8 AWG and larger shall be made with screw pressure connectors made of high strength structural aluminum alloy and UL-approved for use with both copper and/or aluminum wire as manufactured by Thomas & Betts. Joints shall be insulated with plastic splicing tape, tapered half-lapped and at least the thickness equivalent to 1.5 times the conductor insulation. Tapes shall be fresh and of quality equal to Scotch.

C. Use U.L. listed pulling compound for installation of conductors in conduits.

D. Correspond each circuit to the branch number indicated on the panel schedule shown on the drawings except where departures are approved by the ENGINEER.

E. All wiring, including low voltage, shall be installed in conduit.

F. Control wiring to conform to the wiring diagrams shown on the mechanical drawings and the manufacturer's wiring diagrams.

G. All splices in exterior pull boxes and light poles shall be cast resin encapsulated.

1. Power conductor splices - 3M Scotchcast Series 82/85/90; Plymouth or equal.

2. Control and signal circuits 3M Scotchcast series 8981 thru 8986, Plymouth or equal.

H. Neatly group and lace all wiring in panelboards, motor control centers and terminal cabinets with plastic ties at 3" on centers. Tag all spare conductors.

3.5 TESTING

A. Testing Conduit and Conduit Bends

The CONTRACTOR shall demonstrate the usability of all underground raceways, and field fabricated conduit bends installed as part of this contract.

1. A round tapered segmented semi-rigid mandrel with a diameter approximately 1/4 inch smaller than the diameter of the raceway, shall be pulled through each new raceway.

2. The mandrel shall be pulled through after the raceway installation is completed. Conduits which stubout only, may have the mandrel pulled after the concrete encasement is completed, but prior to completing the backfill.

3. The raceway testing for usability shall be witnessed by ENGINEER. The raceway testing shall be witnessed by a representative of the Respective Utility Company where applicable.

4. CONTRACTOR shall repair/replace any conduit and conduit bend provided under this contract which will not readily pass the mandrel during this test.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Conduits shall be measured by the unit or fraction thereof installed in accordance with the Contract Documents and as measured by the Engineer. The quantities as contained on the Schedule of Quantities and Prices or approved Schedule of Values as derived from the plans will be used as the basis for this measurement.

B. Wire and Cable shall be measured by the unit or fraction thereof installed in accordance with the Contract Documents and as measured by the Engineer. The quantities as contained on the Schedule of Quantities and Prices or approved Schedule of Values as derived from the plans will be used as the basis for this measurement.

4.2 PAYMENT

A. Conduits constructed in accordance with the Contract Documents will be paid for at the Contract Unit Price as listed in the Schedule of Quantities and Prices. This price shall be full compensation for furnishing all labor, materials, tools, equipment, supplies, supervision, and incidentals necessary for Conduits described by the Contract Documents.

B. Wire and Cable constructed in accordance with the Contract Documents will be paid for at the Contract Unit Price as listed in the Schedule of Quantities and Prices. This price shall be full compensation for furnishing all labor, materials, tools, equipment, supplies, supervision, and incidentals necessary for Wire and Cable described by the Contract Documents.

C.

Item No.	Description	Pay Unit
16-01110.01	1" PVC SCHEDULE 40 CONDUIT-ELECTRICAL	Linear Foot
16-01110.01	1 1/2" PVC SCHEDULE 40 CONDUIT-ELECTRICAL	Linear Foot
16-01110.01	2" PVC SCHEDULE 40 CONDUIT-ELECTRICAL	Linear Foot
16-01110.01	#10 WIRE THHN/THWN	Linear Foot
16-01110.01	#8 WIRE THHN/THWN	Linear Foot
16-01110.01	#6 WIRE THHN/THWN	Linear Foot
16-01110.01	#2 WIRE THHN/THWN	Linear Foot
16-01110.01	3/16" POLY-PROPYLENE PULL ROPE	Linear Foot

END OF SECTION

SECTION 16500 - LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Work Included: All labor, materials, appliances, tools, equipment, facilities, transportation and services necessary for and incidental to performing all operations in connection with furnishing, delivery and installation of the work of this Section, complete, as shown on the drawings and/or specified herein. Work includes, but is not necessarily limited to, the following:

1. Examine all other sections for work related to those other sections and required to be included as work under this section.

2. General provisions and requirements for electrical work.

1.2 SUBMITTALS

A. Shop drawings:

1. For special assemblies. Musco Sports Lighting product shall be supplied to city directly. No alternates shall be accepted.

B. Product data:

1. Lighting:

a. Names of manufacturers, cuts, catalog numbers and photometric performance data and iso-footcandle plots where applicable of all lighting fixtures to be used on project.

b. Identify fixtures by Fixture Schedule number, including special notations for finishes, colors, and mountings.

C. Contract closeout information:

1. 5 year warranty for LED drivers and chips.

2. 5 year warranty of paint finish

PART 2 - PRODUCTS

2.1 LIGHTING FIXTURES - GENERAL

A. Acceptable manufacturers:

1. Lighting fixtures:

a. Base:

1) As indicated on Fixture Schedule.

2. Contactors:

a. Base:

1) Schneider Electric/Square D.

2) Eaton Electrical.

3) General Electric.

4) Allen-Bradley.

3. Rigid PVC conduit:

a. Base:

1) As specified in Section 16111.

B. All lighting fixtures and electrical components: UL labeled and DLC approved.

C. Luminaire and pole assemblies: As scheduled.

D. Poles: Steel, designed for 100 MPH constant velocity wind load.

1. Include base template, 4 anchor bolts, cadmium-plated hardware and pole grounding lug, handhole, cast steel anchor base and bolt covers.

E. Pole foundations: As indicated.

F. Underground wiring:

1. Type THHN or THWN installed in rigid PVC conduit.

2. Provide all wiring runs with separate green equipment grounding conductor, and ground all pole bases.

G. Pole wiring from base to driver: No.10 type THHN/THWN, each phase protected by a 30 A, 600 volt type Tron waterproof fuseholder, Bussmann "Limitron" type, size rating 3-times load current.

H. Contactors: Electrically held type, rated at 600 volts AC, 30 ampere lighting load, minimum with number of poles required, 120/277-volt operating coil (as required per plan), designed for tungsten, metal halide, and LED lamp loads.

1. Installed inside meter pedestal.

2.2 LAMPS

A. Light Emitting Diodes (LED) lamps:

1. LED Light Engines.

a. LED's shall have a maximum correlated color temperature of (CCT) 4000 degrees Kelvin.

b. Minimum color rendering index (CRI) for clear lamps is 70.

c. Minimum system Lumen Per Watt (LPW) ratio shall be equal to or greater than 80 LPW

2. Luminaires: As indicated in fixture schedule.

2.3 SPARE

A. Deliver to SCRRA spare lumenaire in quantities as follows:

1. 2 of each lumenaire type.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install all roadway, walkway and parking lighting, and their wiring as indicated.

B. Make conduit bends without injuring conduit or reducing internal diameter.

3.2 ADJUST AND CLEAN

A. Wipe all lighting fixture reflectors, lenses, lamps and trims, clean, after installation. All fixtures shall be installed with caution so as to avoid any fingerprints or smudges on surfaces of parabolic louvers and downlight reflectors. Any fixtures with fingerprints or smudges shall be cleaned.

B. Replace all lamps operated during construction period with new lamps prior to final acceptance.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Light poles including concrete foundation shall be measured by the unit or fraction thereof installed in accordance with the Contract Documents and as measured by the Engineer. The quantities as contained on the Schedule of Quantities and Prices or approved Schedule of Values as derived from the plans will be used as the basis for this measurement.

4.2 PAYMENT

A. This price shall be full compensation for furnishing all labor, materials, tools, equipment, supplies, supervision, and incidentals necessary for Light pole assemblies described by the Contract Documents.

Item No.	Description	Pay Unit
16-05000.01	FIXTURE TYPE 'A' - SITE LIGHT/ POLE/FITTER	Each
16-05000.01	FIXTURE TYPE 'B' - SITE LIGHT/FITTER	Each
16-05000.01	METER PED 400A	Each

END OF SECTION