

CITY OF CARLSBAD

San Diego County

California

**CONTRACT DOCUMENTS,
GENERAL PROVISIONS,
SUPPLEMENTAL PROVISIONS, AND
TECHNICAL SPECIFICATIONS**

FOR

**CALAVERA HILLS
COMMUNITY PARK
GATEWAY IMPROVEMENTS**

CONTRACT NO. 4601

BID NO. PWS21-1254PKS (RE-BID)



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INFORMATION TO BIDDERS

Questions on the bid documents during the bid period shall be submitted in writing, via email, solely to:

Graham Jordan, Contract Administrator
pwcontractadmin@carlsbadca.gov

Questions shall be definite and certain and shall reference applicable drawing sheets, notes, details or specification sections.

The cutoff date to submit questions regarding this project is September 24, 2020.

No questions will be entertained after that date.

For additional information concerning questions on the bid documents, refer to Notice Inviting Bids, page 9.

MANDATORY PRE-BID MEETING

A mandatory pre-bid meeting is scheduled for September 17, 2020 at 2 p.m., via the on-line video platform that will be emailed to all planholders registered on the City of Carlsbad Planet Bids portal. Bidders must either attend the live pre-bid meeting or view the recorded meeting or its bid will be declared non-responsive. All Bidders must confirm by signing the Certification Form on page 23 that they attended the meeting or viewed the video of the meeting. A link to the video will be sent to all planholders following the meeting.



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CITY OF CARLSBAD, CALIFORNIA

NOTICE INVITING BIDS

Until 11 a.m. on October 8, 2020, the City shall accept sealed bids, clearly marked as such, at the Faraday Center, 1635 Faraday Avenue, Carlsbad, CA 92008-7314, Attn: Purchasing Officer, by mail, delivery service or by deposit in the Bid Box located in the first floor lobby, at which time they will be opened and read, for performing the work as follows: all labor, materials, equipment and other associated items to complete landscape irrigation, planting of trees, shrubs, and groundcover, erosion and water runoff protection (during construction operations), mulching, installation of lighting, shade structures, fitness equipment, picnic tables, benches, concrete paving and stairs, resilient surfacing, and other park amenities, as specified on plans and in accordance with the contract documents. Work under this contract shall also include installation of two entry monument signs.

CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS

CONTRACT NO. 4601

BID NO. PWS21-1254PKS (RE-BID)

ELECTRONIC FORMAT RECEIPT AND OPENING OF BIDS: Bids will be received in electronic format (eBids) **EXCLUSIVELY** at the City of Carlsbad's electronic bidding (eBidding) site, at: <https://www.carlsbadca.gov/services/depts/finance/contracting/default.asp> and are due by the date and time shown on the cover of this solicitation.

BIDDERS MUST BE PRE-REGISTERED with the City's bidding system and possess a system-assigned Digital ID in order to submit an electronic bid.

The City's electronic bidding (eBidding) system will automatically track information submitted to the site including IP addresses, browsers being used and the URLs from which information was submitted. In addition, the City's bidding system will keep a history of every login instance including the time of login, and other information about the user's computer configuration such as the operating system, browser type, version, and more. Because of these security features, Bidders who disable their browsers' cookies will not be able to log in and use the City's bidding system.

The City's electronic bidding system is responsible for bid tabulations. Upon the bidder's or proposer's entry of their bid, the system will ensure that all required fields are entered. The system will not accept a bid for which any required information is missing. This includes all necessary pricing, subcontractor listing(s) and any other essential documentation and supporting materials and forms requested or contained in these solicitation documents.

BIDS REMAIN SEALED UNTIL DUE DATE AND TIME.

eBids are transmitted into the City's bidding system via hypertext transfer protocol secure (https) mechanism using SSL 128-256-bit security certificates issued from Verisign/Thawte which encrypts data being transferred from client to server. Bids submitted prior to the Due Date and Time are not available for review by anyone other than the submitter, who will have until the Due Date and Time to change, rescind or retrieve its bid should they desire to do so.

BIDS MUST BE SUBMITTED BY DUE DATE AND TIME.

Once the deadline is reached, no further submissions are accepted into the system. Once the Due Date and Time has passed, bidders, proposers, the general public, and City staff are able to



immediately see the results online. City staff may then begin reviewing the submissions for responsiveness, compliance and other issues.

RECAPITULATION OF THE WORK.

Bids shall not contain any recapitulation of the Work. Conditional Bids may be rejected as being non-responsive. Alternative proposals will not be considered unless called for.

BIDS MAY BE WITHDRAWN by the Bidder prior to, but not after, the time set as Due Date and Time.

Important Note: Submission of the electronic bid into the system may not be instantaneous. Due to the speed and capabilities of the user's internet service provider (ISP), bandwidth, computer hardware and other variables, it may take time for the bidder's submission to upload and be received by the City's eBidding system. It is the bidder's sole responsibility to ensure their bids are received on time by the City's eBidding system. The City of Carlsbad is not responsible for bids that do not arrive by the Due Date and Time.

ELECTRONIC SUBMISSIONS CARRY FULL FORCE AND EFFECT.

The Bidder, by submitting their electronic proposal, agrees to and certifies under penalty of perjury under the laws of the State of California, that the certification, forms and affidavits submitted as part of this proposal are true and correct. The bidder, by submitting its electronic bid, acknowledges that doing so carries the same force and full legal effect as a paper submission with a longhand (wet) signature. By submitting an electronic bid, the bidder certifies that the bidder has thoroughly examined and understands the entire Contract Documents (which consist of the plans and specifications, drawings, forms, affidavits and the solicitation documents), and that by submitting the eBid as its bid proposal, the bidder acknowledges, agrees to and is bound by the entire Contract Documents, including any addenda issued thereto, and incorporated by reference in the Contract Documents.

BIDS ARE PUBLIC RECORDS

Upon receipt by the City, bids shall become public records subject to public disclosure. It is the responsibility of the Bidder to clearly identify any confidential, proprietary, trade secret or otherwise legally privileged information contained within the proposal's General references to sections of the California Public Records Act (PRA) will not suffice. If the Bidder does not provide applicable case law that clearly establishes that the requested information is exempt from the disclosure requirements of the PRA, the City shall be free to release the information when required in accordance with the PRA, pursuant to any other applicable law, or by order of any court or government agency, and the Bidder agrees to hold the City harmless for any such release of this information.

This bid and the terms of the Contract Documents and Supplemental Provisions constitute an irrevocable offer that shall remain valid and in full force for a period of 90 days and such additional time as may be mutually agreed upon by the City of Carlsbad and the Bidder.

INSTRUCTIONS TO BIDDERS AND BID REQUIREMENTS

This bid and the terms of the Contract Documents and General Provisions constitute an irrevocable offer that shall remain valid and in full force for a period of 90 days and such additional time as may be mutually agreed upon by the City of Carlsbad and the Bidder.

No bid will be received unless it is made on a proposal form furnished by the Purchasing Department. Each bid must be accompanied by security in a form and amount required by law. The



bidder's security of the second and third next lowest responsive bidders may be withheld until the Contract has been fully executed. The security submitted by all other unsuccessful bidders shall be returned to them, or deemed void, within ten (10) days after the Contract is awarded. Pursuant to the provisions of law (Public Contract Code section 10263), appropriate securities may be substituted for any obligation required by this notice or for any monies withheld by the City to ensure performance under this Contract. Section 10263 of the Public Contract Code requires monies or securities to be deposited with the City or a state or federally chartered bank in California as the escrow agent. The escrow agent shall maintain insurance to cover negligent acts and omissions of the agent in connection with the handling of retentions under this section in an amount not less than \$100,000 per contract.

The City of Carlsbad may disqualify a contractor or subcontractor from participating in bidding when a contractor or subcontractor has been debarred by the City of Carlsbad or another jurisdiction in the State of California as an irresponsible bidder.

The work shall be performed in strict conformity with the plans, provisions, and specifications as approved by the City Council of the City of Carlsbad on file with the City Clerk's Office at 1200 Carlsbad Village Drive, Carlsbad, CA 92008-7314. The specifications for the work include City of Carlsbad Standard Specifications for Public Works Construction; Parts 2, 3 & 6, current edition at time of bid opening and the supplements thereto as published by the "Greenbook" Committee of Public Works Standards, Inc., all hereinafter designated "SSPWC", as amended; and Technical Specifications. Specification Reference is hereby made to the plans and specifications for full particulars and description of the work. The General Provisions (Part 1) to the SSPWC do not apply.

Prebid Substitution Requests. Any Bidder may submit a pre-bid substitution request in accordance with Technical Specifications Section 002600 for items designated below that are not included as a pre-approved manufacturer/vendor.

1. Pre-bid Substitution Request may be submitted for the following item:
 - a. Pre-Engineered Fabric Tension Structures.

The City of Carlsbad encourages the participation of minority and women-owned businesses.

The City of Carlsbad encourages all bidders, suppliers, manufacturers, fabricators and contractors to utilize recycled and recyclable materials when available, appropriate and approved by the Engineer.

BID DOCUMENTS

The bid documents comprise the following documents which must be completed and properly executed including notarization, where indicated.

1. Contractor's Proposal
2. Certification Form for Mandatory Pre-Bid Meeting
3. Bidder's Bond (At Time of Bid Submit PDF Copy via PlanetBids / All Bidders). Bid Bond (Original) Due By 5 PM Next Business Day After Bid Opening/ 5 Apparent Low Bidders.
4. Noncollusion Declaration
5. Designation of Subcontractor and Amount of Subcontractor's Bid
6. Bidder's Statement of Technical Ability and Experience
7. Acknowledgement of Addendum(a)



8. Certificate of Insurance. The riders covering the City, its officials, employees and volunteers may be omitted at the time of bid submittal but shall be provided by the Bidder prior to award of this contract.
9. Bidder's Statement Re Debarment
10. Bidder's Disclosure of Discipline Record
11. Escrow Agreement for Security Deposits - (optional, must be completed if the Bidder wishes to use the Escrow Agreement for Security)

ENGINEER'S ESTIMATE:

All bids will be compared on the basis of the Engineer's Estimate. The estimated quantities are approximate and serve solely as a basis for the comparison of bids. The Engineer's Estimate is \$835,480.

TIME OF COMPLETION:

The contractor shall complete the Work within the time set in the contract as defined in the General Provisions Section 6-7.

SPECIALTY CONTRACTORS:

ACCEPTABLE LICENSE TYPES

Except as provided herein a bid submitted to the City by a Contractor who is not licensed as a contractor pursuant to the Business and Professions Code shall be considered nonresponsive and shall be rejected by the City. In all contracts where federal funds are involved, no bid submitted shall be invalidated by the failure of the bidder to be licensed in accordance with California law. Where federal funds are involved the contractor shall be properly licensed at the time the contract is awarded. In all other cases the contractor shall state their license number, expiration date and classification in the proposal, under penalty of perjury. This invitation to bid does not involve federal funds. The following classifications are acceptable for this contract: A - General Engineering or C-27 – Landscaping.

STATEMENTS OF TECHNICAL ABILITY AND EXPERIENCE FOR CONTRACTOR

Bidder shall demonstrate that they are qualified for the job by providing proof of their experience and technical ability for construction in the disciplines of construction required to complete this job. Proof of Bidder's experience and technical ability (as outlined below) shall be attached to The Bidder's Statements of Technical Ability and Experience to be included with the Contractor's bid. The statement and listing of information shall include but not be limited to the successful construction of the following:

Bidder shall have successfully completed a minimum of three (3) park projects, which are each of a scope equal to or greater than this project, within the last five (5) years. The Bidder's Statements of Technical Ability and Experience shall include a complete list of a minimum of three (3) such previous projects, including for each project:

1. Project Name
2. Location
3. Owner's Representative with telephone number and name to contact
4. Date of completion

The City of Carlsbad reserves the right to disqualify bidders if bidder does not demonstrate the required technical ability and experience.



ESCROW AGREEMENT

If the Contractor intends to utilize the escrow agreement included in the contract documents in lieu of the usual 5% retention from each payment, these documents must be completed and submitted with the signed contract. The escrow agreement may not be substituted at a later date.

OBTAINING PLANS AND SPECIFICATIONS

Bid packages, various supplemental provisions and Contract Documents may be obtained on the City of Carlsbad website at www.carlsbadca.gov. Paper copies will not be sold.

INTENT OF PLANS AND SPECIFICATIONS

Any prospective bidder who is in doubt as to the intended meaning of any part of the drawings, specifications or other contract documents, or finds discrepancies in or omissions from the drawings and specifications may submit to the Engineer a written request for clarification or correction. Any response will be made only by a written addendum duly issued by the Engineer a copy of which will be mailed or delivered to each person receiving a set of the contract documents. No oral response will be made to such inquiry. **Prior to the award of the contract, no addition to, modification of or interpretation of any provision in the contract documents will be given by any agent, employee or contractor of the City of Carlsbad except as hereinbefore specified. No bidder may rely on directions given by any agent, employee or contractor of the City of Carlsbad except as hereinbefore specified.**

REJECTION OF BIDS

The City of Carlsbad reserves the right to reject any or all bids and to waive any minor irregularity or informality in such bids.

PREVAILING WAGE TO BE PAID

The general prevailing rate of wages for each craft or type of worker needed to execute the Contract shall be those as determined by the Director of Industrial Relations pursuant to the sections 1770, 1773, and 1773.1 of the Labor Code. Pursuant to section 1773.2 of the Labor Code, a current copy of applicable wage rates is on file in the Office of the City Engineer. The Contractor to whom the Contract is awarded shall not pay less than the said specified prevailing rates of wages to all workers employed by him or her in the execution of the Contract.

The Prime Contractor shall be responsible for insuring compliance with provisions of section 1777.5 of the Labor Code and section 4100 et seq. of the Public Contracts Code, "Subletting and Subcontracting Fair Practices Act." The City Engineer is the City's "duly authorized officer" for the purposes of section 4107 and 4107.5.

The provisions of Part 7, Chapter 1, of the Labor Code commencing with section 1720 shall apply to the Contract for work.

A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code or engage in the performance of any contract for public work, unless currently registered and qualified to perform public work pursuant to Section 1725.5. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

The Prime Contractor and all subcontractors shall comply with Section 1776 of the Labor Code, which generally requires keeping accurate payroll records, verifying and certifying payroll records, and making them available for inspection. Contractor shall require all subcontractors to comply with Section 1776.



MANDATORY PRE-BID MEETING

A **mandatory** pre-bid meeting is scheduled for September 17, 2020 at 2 p.m., via the on-line video platform that will be emailed to all planholders registered on the City of Carlsbad Planet Bids portal. Bidders must either attend the live pre-bid meeting or view the recorded meeting or its bid will be declared non-responsive. All Bidders must confirm by signing the Certification Form on page 23 that they attended the meeting or viewed the video of the meeting. A link to the video will be sent to all planholders following the meeting.

UNIT PRICES AND COMPUTATION OF BIDS

All bids are to be computed on the basis of the given estimated quantities of work, as indicated in this proposal, times the unit price as submitted by the bidder.

BIDDER'S INQUIRIES

Questions on the bid documents during the bid period shall be submitted in writing, via email, solely to:

Graham Jordan, Contract Administrator

graham.jordan@carlsbadca.gov

Bidders are advised that a Pre-Bid Substitution Request may be submitted for Pre-Engineered Fabric Shade Structures. Pre-bid substitution request shall be submitted to Contract Administrator in accordance with the Instructions to Bidders and Technical Specifications Section 002600 a minimum of 14 calendar days prior to bid opening.

The cutoff date to submit pre-bid substitution requests or questions regarding this project is September 24, 2020. No questions will be entertained after that date.

Questions shall be definite and certain and shall reference applicable drawing sheets, notes, details or specification sheets.

The answers to questions and pre-bid substitution requests submitted during the bidding period will be published in an addendum and provided to those bidding on the project by October 1, 2020.

ADDENDA

Bidders are advised to verify the issuance of all addenda and receipt thereof one day prior to bidding. Submission of bids without acknowledgment of addenda may be cause of rejection of bid.

BOND AND INSURANCE REQUIREMENTS

The Contractor shall provide bonds to secure faithful performance and warranty of the work in an amount equal to one hundred percent (100%) of the Contract price on this project. The Contractor shall provide bonds to secure payment of laborers and materials suppliers, in an amount equal to one hundred percent (100%) of the total amount payable by the terms of the contract. These bonds shall be kept in full force and effect during the course of this project and shall extend in full force and effect and be retained by the City until they are released as stated in the General Provisions section of this contract. All bonds are to be placed with a surety insurance carrier admitted and authorized to transact the business of insurance in California and whose assets exceed their



liabilities in an amount equal to or in excess of the amount of the bond. The bonds are to be accompanied by the following documents:

- 1) An original, or a certified copy, of the unrevoked appointment, power of attorney, by laws, or other instrument entitling or authorizing the person who executed the bond to do so.
- 2) A certified copy of the certificate of authority of the insurer issued by the insurance commissioner.

If the bid is accepted, the City may require copies of the insurer's most recent annual statement and quarterly statement filed with the Department of Insurance pursuant to Article 10 (commencing with section 900) of Chapter 1 of Part 2 of Division 1 of the Insurance Code, within 10 calendar days of the insurer's receipt of a request to submit the statements.

Insurance is to be placed with insurers that:

- 1) Have a rating in the most recent Best's Key Rating Guide of at least A-:VII
- 2) Are admitted and authorized to transact the business of insurance in the State of California by the Insurance Commissioner.

Auto policies offered to meet the specification of this contract must:

- 1) Meet the conditions stated above for all insurance companies.
- 2) Cover any vehicle used in the performance of the contract, used onsite or offsite, whether owned, non-owned or hired, and whether scheduled or non-scheduled.

Workers' compensation insurance required under this contract must be offered by a company meeting the above standards with the exception that the Best's rating condition is waived. The City does accept policies issued by the State Compensation Fund meeting the requirement for workers' compensation insurance.

The Contractor shall be required to maintain insurance as specified in the Contract. Any additional cost of said insurance shall be included in the bid price.

The award of the contract by the City Council is contingent upon the Contractor submitting the required bonds and insurance, as described in the contract, within twenty days of bid opening. If the Contractor fails to comply with these requirements, the City may award the contract to the second or third lowest bidder and the bid security of the lowest bidder may be forfeited.

BUSINESS LICENSE

The prime contractor and all subcontractors are required to have and maintain a valid City of Carlsbad Business License for the duration of the contract.

Approved by the City Council of the City of Carlsbad, California, by Resolution No. 2020-038, adopted on the 25th day of February, 2020.

August 25, 2020

Date

Graham Jordan

Graham Jordan, Deputy Clerk



CITY OF CARLSBAD

CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS CONTRACT NO. 4601

CONTRACTOR'S PROPOSAL

City Council
City of Carlsbad
1200 Carlsbad Village Drive
Carlsbad, California 92008

The undersigned declares he/she has carefully examined the location of the work, read the Notice Inviting Bids, examined the Plans, Specifications, General Provisions, Contract Documents, and addenda thereto, and hereby proposes to furnish all labor, materials, equipment, transportation, and services required to do all the work to complete Contract No. **4601** in accordance with the Plans, Specifications, General Provisions, Contract Documents, and addenda thereto and that he/she will take in full payment therefore the following unit prices for each item complete, to wit:

SCHEDULE 'A'

ITEM NO.	DESCRIPTION	UNIT	ITEM COST
A-1	General Conditions _____ _____ (Lump Sum Price in Words)	LUMP SUM (LS)	
A-2	Traffic Control _____ _____ (Lump Sum Price in Words)	LS	
A-3	Surveying and Construction Staking _____ _____ (Lump Sum Price in Words)	LS	
A-4	Erosion Control, SWPPP Preparation, Implementation and Maintenance _____ _____ (Lump Sum Price in Words)	LS	



ITEM NO.	DESCRIPTION	UNIT	ITEM COST
A-5	Demolition, Clearing & Grubbing <hr/> <hr/> (Lump Sum Price in Words)	LS	
A-6	Grading <hr/> <hr/> (Lump Sum Price in Words)	LS	
A-7	Drainage <hr/> <hr/> (Lump Sum Price in Words)	LS	
A-8	Replace Curb, Gutter & Sidewalk and Pedestrian Ramp <hr/> <hr/> (Lump Sum Price in Words)	LS	
A-9	Colored Concrete Pavement <hr/> <hr/> (Lump Sum Price in Words)	LS	
A-10	Colored Concrete Pavement with Exposed Aggregate Finish <hr/> <hr/> (Lump Sum Price in Words)	LS	
A-11	Natural Color Concrete Pavement <hr/> <hr/> (Lump Sum Price in Words)	LS	
A-12	Concrete Stairs with Railing <hr/> <hr/> (Lump Sum Price in Words)	LS	
A-13	Poured in Place Resilient Surfacing <hr/> <hr/> (Lump Sum Price in Words)	LS	



ITEM NO.	DESCRIPTION	UNIT	ITEM COST
A-14	Pre-Engineered Fabric Shade Structures <hr/> <hr/> (Lump Sum Price in Words)	LS	
A-15	Outdoor Fitness Equipment <hr/> <hr/> (Lump Sum Price in Words)	LS	
A-16	Site Amenities <hr/> <hr/> (Lump Sum Price in Words)	LS	
A-17	Seat Wall with Stone Veneer <hr/> <hr/> (Lump Sum Price in Words)	LS	
A-18	Barbeque Prep Table w/ Poured in Place Concrete Counter Top and Stone Veneer <hr/> <hr/> (Lump Sum Price in Words)	LS	
A-19	Landscape Boulders <hr/> <hr/> (Lump Sum Price in Words)	LS	
A-20	Electrical Improvements <hr/> <hr/> (Lump Sum Price in Words)	LS	
A-21	Irrigation System <hr/> <hr/> (Lump Sum Price in Words)	LS	
A-22	Planting <hr/> <hr/> (Lump Sum Price in Words)	LS	
A-23	120-Day Plant Maintenance Period <hr/> <hr/> (Lump Sum Price in Words)	LS	



ITEM NO.	DESCRIPTION	UNIT	ITEM COST
A-24	Record Drawings <hr/> <hr/> (Lump Sum Price in Words)	LS	

Total amount of bid in WORDS for Schedule 'A': _____

Total amount of bid in NUMBERS for Schedule 'A': \$ _____

ADDITIVE ALTERNATE SCHEDULE 'B'

ITEM	DESCRIPTION	UNIT	COST
B-1	Boulder Monument Signs <hr/> <hr/> (Lump Sum Price in Words)	LS	

Total amount of bid in WORDS for Schedule 'B': _____

Total amount of bid in NUMBERS for Schedule 'B': \$ _____

Total amount of bid in words including Schedule "A" and Schedule "B": _____

Total amount of bid in numbers including Schedule "A" and Schedule "B": \$ _____

The City shall determine the low bid based on Schedule "A" alone. After the low Bid has been determined, the City may, at its sole discretion, award the Contract for Schedule "A" alone or for Schedule "A" and Additive Alternative Schedule "B".

Note: A detailed description of bid items is provided in the General Provisions, Section 9-4 BID ITEMS.

Price(s) given above are firm for 90 days after date of bid opening.

Addendum No(s): _____ has/have been received and is/are included in this proposal.



The Undersigned has carefully checked all of the above figures and understands that the City will not be responsible for any error or omission on the part of the Undersigned in preparing this bid.

The Undersigned agrees that in case of default in executing the required Contract with necessary bonds and insurance policies within twenty (20) days from the date of award of Contract by the City Council of the City of Carlsbad, the City may administratively authorize award of the contract to the second or third lowest bidder and the bid security of the lowest bidder may be forfeited.

The Undersigned bidder declares, under penalty of perjury, that the undersigned is licensed to do business or act in the capacity of a contractor within the State of California, validly licensed under license number _____, classification _____ which expires on _____, and Department of Industrial Relations PWC registration number _____ which expires on _____, and that this statement is true and correct and has the legal effect of an affidavit.

A bid submitted to the City by a Contractor who is not licensed as a contractor pursuant to the Business and Professions Code shall be considered nonresponsive and shall be rejected by the City § 7028.15(e). In all contracts where federal funds are involved, no bid submitted shall be invalidated by the failure of the bidder to be licensed in accordance with California law. However, at the time the contract is awarded, the contractor shall be properly licensed.

The Undersigned bidder hereby represents as follows:

1. That no Council member, officer agent, or employee of the City of Carlsbad is personally interested, directly or indirectly, in this Contract, or the compensation to be paid hereunder; that no representation, oral or in writing, of the City Council, its officers, agents, or employees has inducted him/her to enter into this Contract, excepting only those contained in this form of Contract and the papers made a part hereof by its terms; and
2. That this bid is made without connection with any person, firm, or corporation making a bid for the same work, and is in all respects fair and without collusion or fraud.

Accompanying this proposal is _____ (Cash, Certified Check, Bond or Cashier's Check) for ten percent (10%) of the amount bid.

The Undersigned is aware of the provisions of section 3700 of the Labor Code which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code and agrees to comply with such provisions before commencing the performance of the work of this Contract and continue to comply until the contract is complete.

The Undersigned is aware of the provisions of the Labor Code, Part 7, Chapter 1, Article 2, relative to the general prevailing rate of wages for each craft or type of worker needed to execute the Contract and agrees to comply with its provisions.



IF A SOLE OWNER OR SOLE CONTRACTOR SIGN HERE:

- (1) Name under which business is conducted _____
- (2) Signature (given and surname) of proprietor _____
- (3) Place of Business _____
(Street and Number)
City and State _____
- (4) Zip Code _____ Telephone No. _____
- (5) E-Mail _____

IF A PARTNERSHIP, SIGN HERE:

- (1) Name under which business is conducted _____
- (2) Signature (given and surname and character of partner) (Note: Signature must be made by a general partner)

- (3) Place of Business _____
(Street and Number)
City and State _____
- (4) Zip Code _____ Telephone No. _____
- (5) E-Mail _____



IF A CORPORATION, SIGN HERE:

(1) Name under which business is conducted _____

(2)

(Signature)

(Title)

Impress Corporate Seal here

(3) Incorporated under the laws of the State of _____

(4) Place of Business _____
(Street and Number)
City and State _____

(5) Zip Code _____ Telephone No. _____

(6) E-Mail _____

NOTARIAL ACKNOWLEDGMENT OF EXECUTION BY ALL SIGNATORIES MUST BE ATTACHED

List below names of president, vice president, secretary and assistant secretary, if a corporation; if a partnership, list names of all general partners, and managing partners:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____



CERTIFICATION FORM

(To Accompany Proposal)

CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS CONTRACT NO. 4601

MANDATORY PRE-BID MEETING

All Contractors are required to participate in the Mandatory Pre-Bid Meeting for the Calavera Hills Community Park Gateway Improvements project by attending the live pre-bid video meeting in person or by downloading a recorded video of the meeting.

Any Contractor who does not participate shall have its bid declared non-responsive.

☐ I certify that I attended the live mandatory pre-bid video meeting on _____.

☐ I certify that I viewed the recorded mandatory pre-bid video meeting on _____.

BY CONTRACTOR:

(name of Contractor)

By: _____
(sign here)

(print name/title)



BID SECURITY FORM

(Check to Accompany Bid)

CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS CONTRACT NO. 4601

(NOTE: The following form shall be used if check accompanies bid.)

Accompanying this proposal is a *Certified *Cashiers check payable to the order of CITY OF CARLSBAD, in the sum of _____

_____ dollars (\$_____), this amount being ten percent (10%) of the total amount of the bid. The proceeds of this check shall become the property of the City provided this proposal shall be accepted by the City through action of its legally constituted contracting authorities and the undersigned shall fail to execute a contract and furnish the required Performance, Warranty and Payment Bonds and proof of insurance coverage within the stipulated time; otherwise, the check shall be returned to the undersigned. The proceeds of this check shall also become the property of the City if the undersigned shall withdraw his or her bid within the period of fifteen (15) days after the date set for the opening thereof, unless otherwise required by law, and notwithstanding the award of the contract to another bidder.

BIDDER

*Delete the inapplicable word.

(NOTE: If the Bidder desires to use a bond instead of check, the Bid Bond form on the following pages shall be executed--the sum of this bond shall be not less than ten percent (10%) of the total amount of the bid.)



BIDDER'S BOND TO ACCOMPANY PROPOSAL

CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS CONTRACT NO. 4601

KNOW ALL PERSONS BY THESE PRESENTS:

That we, _____, as Principal, and _____, as Surety are held and firmly bound unto the City of Carlsbad, California, in an amount as follows: (must be at least ten percent (10%) of the bid amount) _____ for which payment, well and truly made, we bind ourselves, our heirs, executors and administrators, successors or assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH that if the proposal of the above-bounden Principal for:

CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS CONTRACT NO. 4601

in the City of Carlsbad, is accepted by the City Council, and if the Principal shall duly enter into and execute a Contract including required bonds and insurance policies within twenty (20) days from the date of award of Contract by the City Council of the City of Carlsbad, being duly notified of said award, then this obligation shall become null and void; otherwise, it shall be and remain in full force and effect, and the amount specified herein shall be forfeited to the said City.

In the event Principal executed this bond as an individual, it is agreed that the death of Principal shall not exonerate the Surety from its obligations under this bond.

SIGNED AND SEALED, this _____ day of _____, 20_____

_____(SEAL) _____(SEAL)
(Principal) (Surety)

By: _____ By: _____
(Signature) (Signature)

_____(Print Name/Title) _____(Print Name/Title)

(SEAL AND NOTARIAL ACKNOWLEDGEMENT OF SURETY – ATTACH ATTORNEY-IN-FACT CERTIFICATE)

APPROVED AS TO FORM:

CELIA A. BREWER
City Attorney

By: _____
Assistant City Attorney



GUIDE FOR COMPLETING THE “DESIGNATION OF SUBCONTRACTORS” FORM

REFERENCES Prior to preparation of the following “Subcontractor Disclosure Form” Bidders are urged to review the definitions in section 1-2 of the General Provisions to this Contract, especially, “Bid”, “Bidder”, “Contract”, “Contractor”, “Contract Price”, “Contract Unit Price”, “Engineer”, “Own Organization”, “Subcontractor”, and “Work”. Bidders are further urged to review sections 2-3 SUBCONTRACTS of the General Provisions.

CAUTIONS This form will be used by the Agency to determine the percentage of work that the Bidder proposes to perform. Bidders are cautioned that failure to provide complete and correct information may result in rejection of the bid as non-responsive. Any bid that proposes performance of more than **75 percent** of the work by subcontractors or otherwise to be performed by forces other than the Bidder’s own organization will be rejected as non-responsive. Specialty items of work that may be so designated by the Engineer on the “Contractor’s Proposal” are not included in computing the percentage of work proposed to be performed by the Bidder.

INSTRUCTIONS The Bidder shall set forth the name and location of business of each and every subcontractor whom the Bidder proposes to perform work or labor or render service in or about the work or improvement, and every subcontractor licensed as a contractor by the State of California whom the Bidder proposes to specially fabricate and install any portion of the work or improvement according to detailed drawings contained in the plans and specifications in excess of one-half of one percent (0.5%) of the Bidder’s total bid or, in the case of bids or offers for the construction of streets and highways, including bridges, in excess of one-half of one percent (0.5%) or ten thousand dollars (\$10,000) whichever is greater. Said name(s) and location(s) of business of subcontractor(s) shall be set forth and included as an integral part of the bid offer.

The Designation of Subcontractors form must be submitted as a part of the Bidder’s sealed bid. Failure to provide complete and correct information may result in rejection of the bid as non-responsive.

Suppliers of materials from sources outside the limits of work are not subcontractors. The value of materials and transport of materials from sources outside the limits of work, as shown on the plans, shall be assigned to the Contractor or the Subcontractor as the case may be, that the Bidder proposes as installer of said materials. The value of material incorporated in any Subcontractor-installed bid item that is supplied by the Bidder shall be included as a part of the work that the Bidder proposes to be performed by the Subcontractor installing said item.

When a Subcontractor has a Carlsbad business license, the number must be entered on the proper form. If the Subcontractor does not have a valid business license, enter “NONE” in the appropriate space.

When the Bidder proposes using a Subcontractor to construct or install less than 100 percent of a bid item, the Bidder shall attach an explanation sheet to the Designation of Subcontractor form. The explanation sheet shall clearly apprise the City of the specific facts that show the Bidder proposes to perform no less than **twenty-five percent (25%)** of the work with its own forces.

Determination of the subcontract amounts for purposes of award of the contract shall be determined by the City Council in conformance with the provisions of the contract documents and the various supplemental provisions. The decision of the City Council shall be final.



Contractor is prohibited from performing any work on this project with a subcontractor who is ineligible to perform work on a public works project pursuant to Labor Code Sections 1771.1 or 1777.7.

Bidders shall make any additional copies of the disclosure forms as may be necessary to provide the required information. The page number and total number of additional form pages shall be entered in the location provided on each type of form so duplicated.



DESIGNATION OF SUBCONTRACTOR AND AMOUNT OF SUBCONTRACTOR'S BID ITEMS

(To Accompany Proposal)

CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS CONTRACT NO. 4601

The Bidder certifies that it has used the sub-bid of the following listed subcontractors in preparing this bid for the Work and that the listed subcontractors will be used to perform the portions of the Work as designated in this list in accordance with applicable provisions of the specifications and section 4100 et seq. of the Public Contract Code, "Subletting and Subcontracting Fair Practices Act." The Bidder further certifies that no additional subcontractor will be allowed to perform any portion of the Work in excess of one-half of one percent (0.5%) of the Bidder's total bid, or in the case of bids or offers for construction of streets and highways, including bridges, in excess of one-half of one percent (0.5%) or ten thousand dollars (\$10,000), whichever is greater, and that no changes in the subcontractors listed work will be made except upon the prior approval of the Agency.

SUBCONTRACTOR'S BID ITEMS

Portion of Work	Subcontractor Name and Location of Business	Phone No. and Email Address	DIR Registration No.	Subcontractor's License No. and Classification	Amount of Work by Subcontractor in Dollars*

Page _____ of _____ pages of this Subcontractor Designation form

* Pursuant to section 4104 (a)(3)(A) California Public Contract Code, receipt of the information preceded by an asterisk may be submitted by the Bidder up to 24 hours after the deadline for submitting bids contained in the "Notice Inviting Bids."



BIDDER'S STATEMENT OF TECHNICAL ABILITY AND EXPERIENCE

(To Accompany Proposal)

CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS CONTRACT NO. 4601

The Bidder is required to state what work of a similar character to that included in the proposed Contract he/she has successfully performed and give references, with telephone numbers, which will enable the City to judge his/her responsibility, experience and skill. An attachment can be used.

Date Contract Com- pleted	Name and Address of the Employer	Name and Phone No. of Person to Contract	Type of Work	Amount of Con- tract



BIDDER'S CERTIFICATE OF INSURANCE FOR GENERAL LIABILITY, EMPLOYERS' LIABILITY, AUTOMOTIVE LIABILITY AND WORKERS' COMPENSATION

(To Accompany Proposal)

CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS CONTRACT NO. 4601

As a required part of the Bidder's proposal the Bidder must attach either of the following to this page.

1) Certificates of insurance showing conformance with the requirements herein for each of:

- ☐ Comprehensive General Liability
- ☐ Automobile Liability
- ☐ Workers Compensation
- ☐ Employer's Liability

2) Statement with an insurance carrier's notarized signature stating that the carrier can, and upon payment of fees and/or premiums by the Bidder, will issue to the Bidder Policies of insurance for Comprehensive General Liability, Automobile Liability, Workers Compensation and Employer's Liability in conformance with the requirements herein and Certificates of insurance to the Agency showing conformance with the requirements herein.

All certificates of insurance and statements of willingness to issue insurance for auto policies offered to meet the specification of this contract must:

- 1) Meet the conditions stated in The Notice Inviting Bids and the General Provisions for this project for each insurance company that the Contractor proposes.
- 2) Cover any vehicle used in the performance of the contract, used onsite or offsite, whether owned, non-owned or hired, and whether scheduled or non-scheduled.



BIDDER'S STATEMENT RE DEBARMENT

(To Accompany Proposal)

CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS CONTRACT NO. 4601

- 1) Have you or any of your subcontractors ever been debarred as an irresponsible bidder by another jurisdiction in the State of California?

yes

no

- 2) If yes, what was/were the name(s) of the agency(ies) and what was/were the period(s) of debarment(s)? Attach additional copies of this page to accommodate more than two debarments.

party debarred

party debarred

agency

agency

period of debarment

period of debarment

BY CONTRACTOR:

(name of Contractor)

By: _____
(sign here)

(print name/title)

Page _____ of _____ pages of this Re Debarment form



BIDDER'S DISCLOSURE OF DISCIPLINE RECORD

(To Accompany Proposal)

CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS CONTRACT NO. 4601

Contractors are required by law to be licensed and regulated by the Contractors' State License Board which has jurisdiction to investigate complaints against contractors if a complaint regarding a patent act or omission is filed within four years of the date of the alleged violation. A complaint regarding a latent act or omission pertaining to structural defects must be filed within 10 years of the date of the alleged violation. Any questions concerning a contractor may be referred to the Registrar, Contractors' State License board, P.O. Box 26000, Sacramento, California 95826.

- 1) Have you ever had your contractor's license suspended or revoked by the California Contractors' State license Board two or more times within an eight year period?

yes

no

- 2) Has the suspension or revocation of your contractor's license ever been stayed?

yes

no

- 3) Have any subcontractors that you propose to perform any portion of the Work ever had their contractor's license suspended or revoked by the California Contractors' State license Board two or more times within an eight year period?

yes

no

- 4) Has the suspension or revocation of the license of any subcontractor's that you propose to perform any portion of the Work ever been stayed?

yes

no

- 5) If the answer to either of 1. or 3. above is yes fully identify, in each and every case, the party disciplined, the date of and violation that the disciplinary action pertain to, describe the nature of the violation and the disciplinary action taken therefore.

(If needed attach additional sheets to provide full disclosure.)

Page ____ of ____ pages of this Disclosure of Discipline form



**NONCOLLUSION DECLARATION TO BE EXECUTED BY
BIDDER AND SUBMITTED WITH BID
PUBLIC CONTRACT CODE SECTION 7106**

**CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS
CONTRACT NO. 4601**

The undersigned declares:

I am the _____ of _____, the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____, 20____ at _____ [city], _____ [state].

Signature of Bidder



CONTRACT PUBLIC WORKS

This agreement is made this _____ day of _____, 2020, by and between the City of Carlsbad, California, a municipal corporation, (hereinafter called "City"), and _____ whose principal place of business is _____ (hereinafter called "Contractor").

City and Contractor agree as follows:

1. Description of Work. Contractor shall perform all work specified in the Contract documents for:

CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS CONTRACT NO. 4601

(hereinafter called "project")

2. Provisions of Labor and Materials. Contractor shall provide all labor, materials, tools, equipment, and personnel to perform the work specified by the Contract Documents.

3. Contract Documents. The Contract Documents consist of this Contract, Notice Inviting Bids, Contractor's Proposal, Bidder's Bond, Noncollusion Declaration, Designation of Subcontractors, Technical Ability and Experience, Bidder's Statement Re Debarment, Escrow Agreement, Release Form, the Plans and Specifications, the General Provisions, addendum(s) to said Plans and Specifications and General Provisions, and all proper amendments and changes made thereto in accordance with this Contract or the Plans and Specifications, and all bonds for the project; all of which are incorporated herein by this reference.

Contractor, her/his subcontractors, and materials suppliers shall provide and install the work as indicated, specified, and implied by the Contract Documents. Any items of work not indicated or specified, but which are essential to the completion of the work, shall be provided at the Contractor's expense to fulfill the intent of said documents. In all instances through the life of the Contract, the City will be the interpreter of the intent of the Contract Documents, and the City's decision relative to said intent will be final and binding. Failure of the Contractor to apprise subcontractors and materials suppliers of this condition of the Contract will not relieve responsibility of compliance.

4. Payment. For all compensation for Contractor's performance of work under this Contract, City shall make payment to the Contractor per section 9-3 PAYMENT of the General Provisions section of this contract. The Engineer will close the estimate of work completed for progress payments on the last working day of each month. The City shall withhold retention as required by Public Contract Code Section 9203.

5. Independent Investigation. Contractor has made an independent investigation of the jobsite, the soil conditions at the jobsite, and all other conditions that might affect the progress of the work and is aware of those conditions. The Contract price includes payment for all work that



may be done by Contractor, whether anticipated or not, in order to overcome underground conditions. Any information that may have been furnished to Contractor by City about underground conditions or other job conditions is for Contractor's convenience only, and City does not warrant that the conditions are as thus indicated. Contractor is satisfied with all job conditions, including underground conditions and has not relied on information furnished by City.

6. Hazardous Waste or Other Unusual Conditions. If the contract involves digging trenches or other excavations that extend deeper than four feet below the surface Contractor shall promptly, and before the following conditions are disturbed, notify City, in writing, of any:

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

B. Differing Conditions. Subsurface or latent physical conditions at the site differing from those indicated.

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

City shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in contractor's costs of, or the time required for, performance of any part of the work shall issue a change order under the procedures described in this contract.

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

7. Immigration Reform and Control Act. Contractor certifies it is aware of the requirements of the Immigration Reform and Control Act of 1986 (8 USC sections 1101-1525) and has complied and will comply with these requirements, including, but not limited to, verifying the eligibility for employment of all agents, employees, subcontractors, and consultants that are included in this Contract.

8. Prevailing Wage. Pursuant to the California Labor Code, the director of the Department of Industrial Relations has determined the general prevailing rate of per diem wages in accordance with California Labor Code, section 1773 and a copy of a schedule of said general prevailing wage rates is on file in the office of the City Engineer and is incorporated by reference herein. Pursuant to California Labor Code, section 1775, Contractor shall pay prevailing wages. Contractor shall post copies of all applicable prevailing wages on the job site. Contractor shall comply with California Labor Code, section 1776, which generally requires keeping accurate payroll records, verifying and certifying payroll records, and making them available for inspection. Contractor shall require all subcontractors to comply with Section 1776.



9. Indemnification. Contractor shall assume the defense of, pay all expenses of defense, and indemnify and hold harmless the City, and its officers and employees, from all claims, loss, damage, injury and liability of every kind, nature and description, directly or indirectly arising from or in connection with the performance of the Contract or work; or from any failure or alleged failure of Contractor to comply with any applicable law, rules or regulations including those relating to safety and health; and from any and all claims, loss, damages, injury and liability, howsoever the same may be caused, resulting directly or indirectly from the nature of the work covered by the Contract, except for loss or damage caused by the sole or active negligence or willful misconduct of the City. The expenses of defense include all costs and expenses including attorneys' fees for litigation, arbitration, or other dispute resolution method.

Contractor shall also defend and indemnify the City against any challenges to the award of the contract to Contractor, and Contractor will pay all costs, including defense costs for the City. Defense costs include the cost of separate counsel for City, if City requests separate counsel.

Contractor shall also defend and indemnify the City against any challenges to the award of the contract to Contractor, arising in whole or in part from alleged inaccuracies or misrepresentation by the Contractor, whether intentional or otherwise, and Contractor will pay all costs, including defense costs for the City. Defense costs include the cost of separate counsel for City, if City requests separate counsel.

10. Insurance. Contractor shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damage to property which may arise from or in connection with the performance of the work hereunder by the Contractor, his or her agents, representatives, employees or subcontractors. Said insurance shall meet the City's policy for insurance as stated in City Council Policy # 70.

(A) Coverages and Limits Contractor shall maintain the types of coverages and minimum limits indicated herein:

a. **Commercial General Liability (CGL) Insurance:** Insurance written on an "occurrence" basis, including products-completed operations, personal & advertising injury, with limits no less than **\$2,000,000** per occurrence. If a general aggregate limit applies, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.

b. **Business Automobile Liability Insurance:** \$2,000,000 combined single limit per accident for bodily injury and property damage. In addition, the auto policy must cover any vehicle used in the performance of the contract, used onsite or offsite, whether owned, non-owned or hired, and whether scheduled or non-scheduled.

c. **Workers' Compensation and Employers' Liability Insurance:** Workers' compensation limits as required by the Labor Code of the State of California and Employers' Liability limits of \$1,000,000 per incident. Workers' compensation offered by the State Compensation Insurance Fund is acceptable to the City.

(B) Additional Provisions: Contractor shall ensure that the policies of insurance required under this agreement with the exception of Workers' Compensation and Business Automobile Liability Insurance contain, or are endorsed to contain, the following provisions.



a. The City, its officials, employees and volunteers are to be covered as additional insured as respects: liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the contractor; premises owned, leased, hired or borrowed by the contractor. The coverage shall contain no special limitations on the scope of protection afforded to the City, its officials, employees or volunteers. All additional insured endorsements must be evidenced using separate documents attached to the certificate of insurance; one for each company affording general liability, and employers' liability coverage.

b. The Contractor's insurance coverage shall be primary insurance as respects the City, its officials, employees and volunteers. Any insurance or self-insurance maintained by the City, its officials, employees or volunteers shall be in excess of the contractor's insurance and shall not contribute with it.

c. Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the City, its officials, employees or volunteers.

d. Coverage shall state that the contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

(C) Notice of Cancellation. Each insurance policy required by this agreement shall be endorsed to state that coverage shall not be nonrenewed, suspended, voided, canceled, or reduced in coverage or limits except after ten (10) days' prior written notice has been sent to the City by certified mail, return receipt requested.

(D) Deductibles and Self-Insured Retention (S.I.R.) Levels. Any deductibles or self-insured retention levels must be declared to and approved by the City. At the option of the City, either: the insurer shall reduce or eliminate such deductibles or self-insured retention levels as respects the City, its officials and employees; or the contractor shall procure a bond guaranteeing payment of losses and related investigation, claim administration and defense expenses.

(E) Waiver of Subrogation. All policies of insurance required under this agreement shall contain a waiver of all rights of subrogation the insurer may have or may acquire against the City or any of its officials or employees.

(F) Subcontractors. Contractor shall include all subcontractors as insured under its policies or shall furnish separate certificates and endorsements for each subcontractor. Coverages for subcontractors shall be subject to all of the requirements stated herein.

(G) Acceptability of Insurers. Insurance is to be placed with insurers that have a rating in Best's Key Rating Guide of at least A-:VII. Insurers must also be authorized to transact the business of insurance by the State of California Insurance Commissioner as admitted carriers as evidenced by a listing in the official publication of the Department of Insurance of the State of California and/or under the standards specified by City Council Policy # 70.

(H) Verification of Coverage. Contractor shall furnish the City with certificates of insurance and original endorsements affecting coverage required by this clause. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The certificates and endorsements are to be in forms approved by the City and are to be received and approved by the City before the Contract is executed by the City.



(I) Cost of Insurance. The Cost of all insurance required under this agreement shall be included in the Contractor's bid.

11. Claims and Lawsuits. All claims by Contractor shall be resolved in accordance with Public Contract Code section 9204, which is incorporated by reference. A copy of Section 9204 is included in Section 3 of the General Provisions. In addition, all claims by Contractor for \$375,000 or less shall be resolved in accordance with the provisions in the Public Contract Code, Division 2, Part 3, Chapter 1, Article 1.5 (commencing with section 20104) which are incorporated by reference. A copy of Article 1.5 is included in Section 3 of the General Provisions. In the event of a conflict between Section 9204 and Article 1.5, Section 9204 shall apply. Notwithstanding the provisions of this section of the contract, all claims shall comply with the Government Tort Claim Act (section 900 et seq., of the California Government Code) for any claim or cause of action for money or damages prior to filing any lawsuit for breach of this agreement.

(A) Assertion of Claims. Contractor hereby agrees that any contract claim submitted to the City must be asserted as part of the contract process as set forth in this agreement and not in anticipation of litigation or in conjunction with litigation.

(B) False Claims. Contractor acknowledges that if a false claim is submitted to the City, it may be considered fraud and the Contractor may be subject to criminal prosecution.

(C) Government Code. Contractor acknowledges that California Government Code sections 12650 et seq., the False Claims Act, provides for civil penalties where a person knowingly submits a false claim to a public entity. These provisions include false claims made with deliberate ignorance of the false information or in reckless disregard of the truth or falsity of the information.

(D) Penalty Recovery. If the City of Carlsbad seeks to recover penalties pursuant to the False Claims Act, it is entitled to recover its litigation costs, including attorney's fees.

(E) Debarment for False Claims. Contractor hereby acknowledges that the filing of a false claim may subject the Contractor to an administrative debarment proceeding wherein the Contractor may be prevented from further bidding on public contracts for a period of up to five years.

(F) Carlsbad Municipal Code. The provisions of Carlsbad Municipal Code sections 3.32.025, 3.32.026, 3.32.027 and 3.32.028 pertaining to false claims are incorporated herein by reference.

(G) Debarment from Other Jurisdictions. Contractor hereby acknowledges that debarment by another jurisdiction is grounds for the City of Carlsbad to disqualify the Contractor or subcontractor from participating in future contract bidding.

(H) Jurisdiction. Contractor agrees and hereby stipulates that the proper venue and jurisdiction for resolution of any disputes between the parties arising out of this agreement is San Diego County, California.

I have read and understand all provisions of Section 11 above. _____ init _____ init

12. Maintenance of Records. Contractor shall maintain and make available at no cost to the City, upon request, records in accordance with sections 1776 and 1812 of Part 7, Chapter 1, Article 2, of the Labor Code. If the Contractor does not maintain the records at Contractor's principal place of business as specified above, Contractor shall so inform the City by certified letter



accompanying the return of this Contract. Contractor shall notify the City by certified mail of any change of address of such records.

13. Labor Code Provisions. The provisions of Part 7, Chapter 1, commencing with section 1720 of the Labor Code are incorporated herein by reference.

14. Security. Securities in the form of cash, cashier's check, or certified check may be substituted for any monies withheld by the City to secure performance of this contract for any obligation established by this contract. Any other security that is mutually agreed to by the Contractor and the City may be substituted for monies withheld to ensure performance under this Contract.

15. Unfair Business Practices. In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the contractor or subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the contractor, without further acknowledgment by the parties.

16. Provisions Required by Law Deemed Inserted. Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein and included herein, and if, through mistake or otherwise, any such provision is not inserted, or is not correctly inserted, then upon application of either party, the Contract shall forthwith be physically amended to make such insertion or correction.

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17. Additional Provisions. Any additional provisions of this agreement are set forth in the "General Provisions" or "Supplemental Provisions" attached hereto and made a part hereof.

NOTARIAL ACKNOWLEDGMENT OF EXECUTION BY ALL SIGNATORIES MUST BE ATTACHED

(CORPORATE SEAL)

CONTRACTOR:

CITY OF CARLSBAD a municipal corporation of the State of California

(name of Contractor)

By: _____
Matt Hall, Mayor

By: _____
(sign here)

ATTEST:

(print name and title)

Barbara Engleson, City Clerk

By: _____
(sign here)

(print name and title)

President or vice-president **and** secretary or assistant secretary must sign for corporations. If only one officer signs, the corporation must attach a resolution certified by the secretary or assistant secretary under the corporate seal empowering that officer to bind the corporation.

APPROVED AS TO FORM:

CELIA A. BREWER
City Attorney

By: _____
Assistant City Attorney



LABOR AND MATERIALS BOND

WHEREAS, the City Council of the City of Carlsbad, State of California, has awarded to _____ (hereinafter designated as the "Principal"), a Contract for:

CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS CONTRACT NO. 4601

in the City of Carlsbad, in strict conformity with the drawings and specifications, and other Contract Documents now on file in the Office of the City Clerk of the City of Carlsbad and all of which are incorporated herein by this reference.

WHEREAS, Principal has executed or is about to execute said Contract and the terms thereof require the furnishing of a bond, providing that if Principal or any of their subcontractors shall fail to pay for any materials, provisions, provender or other supplies or teams used in, upon or about the performance of the work agreed to be done, or for any work or labor done thereon of any kind, the Surety on this bond will pay the same to the extent hereinafter set forth.

NOW, THEREFORE, WE, _____, as Principal, (hereinafter designated as the "Contractor"), and _____ as Surety, are held firmly bound unto the City of Carlsbad in the sum of _____

Dollars (\$_____), said sum being an amount equal to: One hundred percent (100%) of the total amount payable under the terms of the contract by the City of Carlsbad, and for which payment well and truly to be made we bind ourselves, our heirs, executors and administrators, successors, or assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if the Contractor or his/her subcontractors fail to pay for any materials, provisions, provender, supplies, or teams used in, upon, for, or about the performance of the work contracted to be done, or for any other work or labor thereon of any kind, consistent with California Civil Code section 9100, or for amounts due under the Unemployment Insurance Code with respect to the work or labor performed under this Contract, or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of the contractor and subcontractors pursuant to section 13020 of the Unemployment Insurance Code with respect to the work and labor, that the Surety will pay for the same, and, also, in case suit is brought upon the bond, reasonable attorney's fees, to be fixed by the court consistent with California Civil Code section 9554.

This bond shall inure to the benefit of any of the persons named in California Civil Code section 9100, so as to give a right of action to those persons or their assigns in any suit brought upon the bond.

Surety stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract, or to the work to be performed hereunder or the specifications accompanying the same shall affect its obligations on this bond, and it does hereby waive notice of any change, extension of time, alterations or addition to the terms of the contract or to the work or to the specifications.



In the event that Contractor is an individual, it is agreed that the death of any such Contractor shall not exonerate the Surety from its obligations under this bond.

SIGNED AND SEALED, this _____ day of _____, 20____

_____(SEAL)
(Principal)

_____(SEAL)
(Surety)

By: _____
(Signature)

By: _____
(Signature)

(Print Name & Title)

(Print Name & Title)

(SEAL AND NOTARIAL ACKNOWLEDGEMENT OF SURETY – ATTACH ATTORNEY-IN-FACT CERTIFICATE)

APPROVED AS TO FORM:

CELIA A. BREWER
City Attorney

By: _____
Assistant City Attorney



FAITHFUL PERFORMANCE/WARRANTY BOND

WHEREAS, the City Council of the City of Carlsbad, State of California, has awarded to _____ (hereinafter designated as the "Principal"), a Contract for:

CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS CONTRACT NO. 4601

in the City of Carlsbad, in strict conformity with the contract, the drawings and specifications, and other Contract Documents now on file in the Office of the City Clerk of the City of Carlsbad, all of which are incorporated herein by this reference.

WHEREAS, Principal has executed or is about to execute said Contract and the terms thereof require the furnishing of a bond for the faithful performance and warranty of said Contract;

NOW, THEREFORE, WE, _____, as Principal, (hereinafter designated as the "Contractor"), and _____ as Surety, are held firmly bound unto the City of Carlsbad in the sum of _____

Dollars (\$ _____), said sum being an amount equal to: One hundred percent (100%) of the total amount payable under the terms of the contract by the City of Carlsbad, and for which payment well and truly to be made we bind ourselves, our heirs, executors and administrators, successors, or assigns, jointly and severally, firmly by these presents.

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

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

Surety stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract, or to the work to be performed there under or the specifications accompanying the same shall affect its obligations on this bond, and it does hereby waive notice of any change, extension of time, alterations or addition to the terms of the contract or to the work or to the specifications.



In the event that Contractor is an individual, it is agreed that the death of any such Contractor shall not exonerate the Surety from its obligations under this bond.

SIGNED AND SEALED, this _____ day of _____, 20____

_____(SEAL)
(Principal)

_____(SEAL)
(Surety)

By: _____
(Signature)

By: _____
(Signature)

(Print Name & Title)

(Print Name & Title)

(SEAL AND NOTARIAL ACKNOWLEDGEMENT OF SURETY – ATTACH ATTORNEY-IN-FACT CERTIFICATE)

APPROVED AS TO FORM:

CELIA A. BREWER
City Attorney

By: _____
Assistant City Attorney



OPTIONAL ESCROW AGREEMENT FOR SECURITY DEPOSITS IN LIEU OF RETENTION

This Escrow Agreement is made and entered into by and between the City of Carlsbad whose address is 1200 Carlsbad Village Drive, Carlsbad, California, 92008, hereinafter called "City" and _____ whose address is _____ hereinafter called "Contractor" and _____ whose address is _____ hereinafter called "Escrow Agent."

For the consideration hereinafter set forth, the City, Contractor and Escrow Agent agree as follows:

1. Pursuant to section 22300 of the Public Contract Code of the State of California, the Contractor has the option to deposit securities with the Escrow Agent as a substitute for retention earnings required to be withheld by the City pursuant to the Construction Contract entered into between the City and Contractor for

CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS CONTRACT NO. 4601

in the amount of _____ dated _____ (hereinafter referred to as the "Contract"). Alternatively, on written request of the Contractor, the City shall make payments of the retention earnings directly to the Escrow Agent. When the Contractor deposits the securities as a substitute for Contract earnings, the Escrow Agent shall notify the City within 10 days of the deposit. The market value of the securities at the time of the substitution shall be a least equal to the cash amount then required to be withheld as retention under the terms of the contract between the City and Contractor. Securities shall be held in the name of the City and shall designate the Contractor as the beneficial owner.

2. The City shall make progress payments to the Contractor for such funds which otherwise would be withheld from progress payments pursuant to the Contract provisions, provided that the Escrow Agent holds securities in the form and amount specified above.

3. When the City makes payment of retentions earned directly to the Escrow Agent, the Escrow Agent shall hold them for the benefit of the Contractor until such time as the escrow created under this contract is terminated. The Contractor may direct the investment of the payments into securities. All terms and conditions of this agreement and the rights and responsibilities of the parties shall be equally applicable and binding when the City pays the Escrow Agent directly.

4. The Contractor shall be responsible for paying all fees for the expenses incurred by the Escrow Agent in administering the Escrow Account and all expenses of the City. These expenses and payment terms shall be determined by the City, Contractor and Escrow Agent.

5. The interest earned on the securities or the money market accounts held in escrow and all interest earned on that interest shall be for the sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to the City.



6. Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from City to the Escrow Agent that City consents to the withdrawal of the amount sought to be withdrawn by Contractor.

7. The City shall have a right to draw upon the securities in the event of default by the Contractor. Upon seven days' written notice to the Escrow Agent from the City of the default, the Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by the City.

8. Upon receipt of written notification from the City certifying that the Contract is final and complete and that the Contractor has complied with all requirements and procedures applicable to the Contract, the Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all moneys and securities on deposit and payments of fees and charges.

9. The Escrow Agent shall rely on the written notifications from the City and the Contractor pursuant to sections (1) to (8), inclusive, of this agreement and the City and Contractor shall hold Escrow Agent harmless from Escrow Agent's release, conversion and disbursement of the securities and interest as set forth above.

10. The names of the persons who are authorized to give written notices or to receive written notice on behalf of the City and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:

For City: Title FINANCE DIRECTOR

Name _____

Signature _____

Address 1635 Faraday Avenue, Carlsbad, CA 92008

For Contractor: Title _____

Name _____

Signature _____

Address _____

For Escrow Agent: Title _____

Name _____

Signature _____

Address _____

At the time the Escrow Account is opened, the City and Contractor shall deliver to the Escrow Agent a fully executed counterpart of this Agreement.



IN WITNESS WHEREOF, the parties have executed this Agreement by their proper officers on the date first set forth above.

For City:

Title MAYOR

Name _____

Signature _____

Address 1200 Carlsbad Village Drive, Carlsbad, CA 92008

For Contractor:

Title _____

Name _____

Signature _____

Address _____

For Escrow Agent:

Title _____

Name _____

Signature _____

Address _____



**GENERAL PROVISIONS
FOR
CALAVERA HILLS COMMUNITY PARK
GATEWAY IMPROVEMENTS
CONTRACT NO. 4601

CITY OF CARLSBAD**

**BIDDERS ARE ADVISED THAT THIS SECTION REPLACES PART 1,
GENERAL PROVISIONS, OF THE STANDARD SPECIFICATIONS FOR
PUBLIC WORKS CONSTRUCTION**

SECTION 1 -- TERMS, DEFINITIONS, ABBREVIATIONS, AND SYMBOLS

1-1 TERMS – Unless otherwise stated, the words *directed, required, permitted, ordered, instructed, designated, considered necessary, prescribed, approved, acceptable, satisfactory*, or words of like meaning, refer to actions, expressions, and prerogatives of the Engineer.

1-1.1 Reference to Drawings. Where words "shown", "indicated", "detailed", "noted", "scheduled", or words of similar import are used, it shall be understood that reference is made to the plans accompanying these provisions, unless stated otherwise.

1-1.2 Directions. Where words "directed", "designated", "selected", or words of similar import are used, it shall be understood that the direction, designation or selection of the Engineer is intended, unless stated otherwise. The word "required" and words of similar import shall be understood to mean "as required to properly complete the work as required and as approved by the Engineer," unless stated otherwise.

1-1.3 Equals and Approvals. Where the words "equal", "approved equal", "equivalent", and such words of similar import are used, it shall be understood such words are followed by the expression "in the opinion of the Engineer", unless otherwise stated. Where the words "approved", "approval", "acceptance", or words of similar import are used, it shall be understood that the approval, acceptance, or similar import of the Engineer is intended.

1-1.4 Perform. The word "perform" shall be understood to mean that the Contractor, at its expense, shall perform all operations, labor, tools and equipment, and further, including the furnishing and installing of materials that are indicated, specified or required to mean that the Contractor, at its expense, shall furnish and install the work, complete in place and ready to use, including furnishing of necessary labor, materials, tools, equipment, and transportation.

1-2 DEFINITIONS. The following words, or groups of words, shall be exclusively defined by the definitions assigned to them herein.



Addendum – Written or graphic instrument issued prior to the opening of Bids which clarifies, corrects, or changes the bidding or Contract Documents. The term Addendum shall include bulletins and all other types of written notices issued to potential bidders prior to opening of Bids.

Agency – The City of Carlsbad, California.

Agreement – See Contract.

Assessment Act Contract – A Contract financed by special assessments authorized under a State Act or procedural ordinance of a City or County.

Base – A layer of specified material of planned thickness placed immediately below the pavement or surfacing.

Bid – The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work.

Bidder – Any individual, firm, partnership, corporation, or combination thereof, submitting a Bid for the Work, acting directly or through a duly authorized representative.

Board – The officer or body constituting the awarding authority of the Agency, which is the City Council for the City of Carlsbad or the Board of Directors of Carlsbad Municipal Water District.

Bond – Bid, performance, and payment bond or other instrument of security.

City Council – the City Council of the City of Carlsbad.

City Manager – the City Manager of the City of Carlsbad or his/her approved representative.

Cash Contract – A Contract financed by means other than special assessments.

Change Order – A written order to the Contractor signed by the Agency directing an addition, deletion, or revision in the Work, or an adjustment in the Contract Price or the Contract time issued after the effective date of the Contract. A Change Order may or may not also be signed by the Contractor.

Code – The terms *Government Code*, *Labor Code*, etc., refer to codes of the State of California.

Construction Manager– the Project Inspector's immediate supervisor and first level of appeal for informal dispute resolution.

Contract – The written agreement between the Agency and the Contractor covering the Work.

Contract Documents – Including but not limited to; the Contract, any Addendum (which pertain to the contract documents), Notice Inviting Bids, Instructions to Bidders; Bid (including documentation accompanying the Bid and any post-bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Contract, the Bonds, the General Provisions, permits from other agencies, the Technical Specifications, the Supplemental Provisions, the Plans, Standard Plans, Standard Specifications, Reference Specifications, and all Modifications issued after the execution of the Contract.



Contractor – The individual, partnership, corporation, joint venture, or other legal entity having a Contract with the Agency to perform the Work. In the case of work being done under permit issued by the Agency, the permittee shall be constructed to be the Contractor. The term “prime contractor” shall mean Contractor.

Contract Price – The total amount of money for which the Contract is awarded.

Contract Unit Price – The amount stated in the Bid for a single unit of an item of work.

County Sealer – The Sealer of Weights and Measures of the county in which the Contract is let.

Days – Days shall mean consecutive calendar’s days unless otherwise specified.

Deputy City Engineer, Construction Management & Inspection – The Construction Manager’s immediate supervisor and second level of appeal for informal dispute resolution.

Dispute Board – Persons designated by the City Manager of the City of Carlsbad or Executive Manager of the Carlsbad Municipal Water District, to hear and advise the City Manager on claims submitted by the Contractor. The City Manager for the City of Carlsbad or the Executive Manager for the Carlsbad Municipal Water District is the last appeal level for informal dispute resolution.

Electrolier – Street light assembly complete, including foundation, standard, luminaire arm, luminaire, etc.

Engineer – The City Engineer of the City of Carlsbad or his/her approved representative. The Engineer is the third level of appeal for informal dispute resolution.

Geotextile – Synthetic fiber used in civil engineering applications, serving the primary functions of separation and filtration.

House Connection Sewer – A sewer, within a public street or right-of-way, proposed to connect any parcel, lot, or part of a lot with a mainline sewer.

House Sewer – A sewer, wholly within private property, proposed to connect any building to a house connection sewer.

Luminaire – The lamp housing including the optical and socket assemblies (and ballast if so specified).

Luminaire Arm – The structural member, bracket, or mast arm, which, mounted on the standard, supports the luminaire.

Minor Bid Item – A single contract item constituting less than 10 percent (10%) of the original Contract Price bid.

Modification – Includes Change Orders and Supplemental Agreements. A Modification may only be used after the effective date of the Contract.

Notice of Award – The written notice by the Agency to the successful Bidder stating that upon compliance by it with the required conditions, the Agency will execute the Contract.



Notice to Proceed – A written notice given by the Agency to the Contractor fixing the date on which the Contract time will start.

Own Organization - When used in Section 2-3.1 – Employees of the Contractor who are hired, directed, supervised and paid by the Contractor to accomplish the completion of the Work. Further, such employees have their employment taxes, State disability insurance payments, State and Federal income taxes paid and administered, as applicable, by the Contractor. When used in Section 2-3.1 "own organization" means construction equipment that the Contractor owns or leases and uses to accomplish the Work. Equipment that is owner operated or leased equipment with an operator is not part of the Contractor's Own Organization and will not be included for the purpose of compliance with Section 2-3.1.

Person – Any individual, firm, association, partnership, corporation, trust, joint venture, or other legal entity.

Plans – The drawings, profiles, cross sections, working drawings, and supplemental drawings, or reproductions thereof, approved by the Engineer, which show the location, character, dimensions, or details of the Work.

Private Contract – Work subject to Agency inspection, control, and approval, involving private funds, not administered by the Agency.

Project Inspector – The Engineer's designated representative for inspection, contract administration and first level for informal dispute resolution.

Proposal – See Bid.

Reference Specifications – Those bulletins, standards, rules, methods of analysis or test, codes, and specifications of other agencies, engineering societies, or industrial associations referred to in the Contract Documents. These refer to the latest edition, including amendments in effect and published at the time of advertising the project or issuing the permit, unless specifically referred to by edition, volume, or date.

Roadway – The portion of a street reserved for vehicular use.

Service Connection – Service connections are all or any portion of the conduit, cable, or duct, including meter, between a utility distribution line and an individual consumer.

Sewer – Any conduit intended for the reception and transfer of sewage and fluid industrial waste.

Specifications – General Provisions, Standard Specifications, Technical Specifications, Reference Specifications, Supplemental Provisions, and specifications in Supplemental Agreements between the Contractor and the Board.

Standard – The shaft or pole used to support street lighting luminaire, traffic signal heads, mast arms, etc.

Standard Plans – Details of standard structures, devices, or instructions referred to on the Plans or in Specifications by title or number.



Standard Specifications – The Standard Specifications for Public Works Construction (SSPWC), the “Greenbook”.

State – State of California.

Storm Drain – Any conduit and appurtenances intended for the reception and transfer of storm water.

Street – Any road, highway, parkway, freeway, alley, walk, or way.

Subbase – A layer of specified material of planned thickness between a base and the subgrade.

Subcontractor – An individual, firm, or corporation having a direct contract with the Contractor or with any other Subcontractor for the performance of a part of the Work.

Subgrade – For roadways, that portion of the roadbed on which pavement, surfacing, base, sub-base, or a layer of other material is placed. For structures, the soil prepared to support a structure.

Supervision – Supervision, where used to indicate supervision by the Engineer, shall mean the performance of obligations, and the exercise of rights, specifically imposed upon and granted to the Agency in becoming a party to the Contract. Except as specifically stated herein, supervision by the Agency shall not mean active and direct superintendence of details of the Work.

Supplemental Agreement – A written amendment of the Contract Documents signed by both parties.

Supplemental Provisions – Additions and revisions to the Standard Specifications setting forth conditions and requirements peculiar to the work.

Surety – Any individual, firm, or corporation, bound with and for the Contractor for the acceptable performance, execution, and completion of the Work, and for the satisfaction of all obligations incurred.

Tonne – Also referred to as “metric ton”. Represents a unit of measure in the International System of Units equal to 1,000 kilograms.

Utility – Tracks, overhead or underground wires, pipeline, conduits, ducts, or structures, sewers, or storm drains owned, operated, or maintained in or across a public right of way or private easement.

Work – That which is proposed to be constructed or done under the Contract or permit, including the furnishing of all labor, materials, equipment, and services.

1-3 ABBREVIATIONS

1-3.1 General. The abbreviation herein, together with others in general use, are applicable to these Standard Specifications and to project Plans or other Contract Documents.

All abbreviations and symbols used on Plans for structural steel construction shall conform to those given by the “Manual of Steel Construction” published by the American Institute of Steel Construction, Inc.



1-3.2 Common Usage

Abbreviation

Word or Words

ABAN Abandon
 ABAND Abandoned
 ABS Acrylonitrile – butadiene – styrene
 AC Asphalt Concrete
 ACP Asbestos cement pipe
 ACWS Asphalt concrete wearing surface
 ALT Alternate
 APTS Apartment and Apartments
 AMER STD American Standard
 AWG American Wire Gage (nonferrous wire)
 BC Beginning of curve
 BCR Beginning of curb return
 BDRY Boundary
 BF Bottom of footing
 BLDG Building and Buildings
 BM Bench mark
 BVC Beginning of vertical curve
 B/W Back of wall
 C/C Center to center
 CAB Crushed aggregate base
 CAL/OSHA California Occupational Safety and Health Administration
 CalTrans California Department of Transportation
 CAP Corrugated aluminum pipe
 CB Catch Basin
 Cb Curb
 CBP Catch Basin Connection Pipe
 CBR California Bearing Ratio
 CCR California Code of Regulations
 CCTV Closed Circuit TV
 CES Carlsbad Engineering Standards
 CF Curb face
 CF Cubic foot
 C&G Curb and gutter
 CFR Code of Federal Regulations
 CFS Cubic Feet per Second
 CIP Cast iron pipe
 CIPP Cast-in place pipe
 CL Clearance, center line
 CLF Chain link fence
 CMB Crushed miscellaneous base
 CMC Cement mortar-coated
 CML Cement mortar-lined
 CMWD Carlsbad Municipal Water District
 CO Cleanout (Sewer)
 COL Column
 COMM Commercial
 CONC Concrete
 CONN Connection
 CONST Construct, Construction
 COORD Coordinate
 CSP Corrugated steel pipe
 CSD Carlsbad Standard Drawings
 CTB Cement treated base
 CV Check valve
 CY Cubic yard

D Load of pipe
 dB Decibels
 DBL Double
 DF Douglas fir
 DIA Diameter
 DIP Ductile iron pipe
 DL Dead load
 DR Dimension Ratio
 DT Drain Tile
 DWG Drawing
 DWY Driveway
 DWY APPR Driveway approach
 E Electric
 EA Each
 EC End of curve
 ECR End of curb return
 EF Each face
 EG Edge of gutter
 EGL Energy grade line
 EI Elevation
 ELC Electrolier lighting conduit
 ELT Extra long ton
 ENGR Engineer, Engineering
 EP Edge of pavement
 ESMT Easement
 ETB Emulsion-treated base
 EVC End of vertical curb
 EWA Encina Wastewater Authority
 EXC Excavation
 EXP JT Expansion joint
 EXST Existing
 F Fahrenheit
 F&C Frame and cover
 F&I Furnish and install
 FAB Fabricate
 FAS Flashing arrow sign
 FD Floor drain
 FDN Foundation
 FED SPEC Federal Specification
 FG Finished grade
 FH Fire hydrant
 FL Flow line
 FS Finished surface
 FT-LB Foot-pound
 FTG Footing
 FW Face of wall
 G Gas
 GA Gauge
 GAL Gallon and Gallons
 GALV Galvanized
 GAR Garage and Garages
 GIP Galvanized iron pipe
 GL Ground line or grade line
 GM Gas meter
 GNV Ground Not Visible
 GP Guy pole



GPM.....gallons per minute
 GR.....Grade
 GRTG.....Grating
 GSP.....Galvanized steel pipe
 H.....High or height
 HB.....Hose bib
 HC.....House connection
 HDWL.....Headwall
 HGL.....Hydraulic grade line
 HORIZ.....Horizontal
 HP.....Horsepower
 HPG.....High pressure gas
 HPS.....High pressure sodium (Light)
 HYDR.....Hydraulic
 IE.....Invert Elevation
 ID.....Inside diameter
 INCL.....Including
 INSP.....Inspection
 INV.....Invert
 IP.....Iron pipe
 JC.....Junction chamber
 JCT.....Junction
 JS.....Junction structure
 JT.....Joint
 L.....Length
 LAB.....Laboratory
 LAT.....Lateral
 LB.....Pound
 LD.....Local depression
 LF.....Linear foot
 LH.....Lamp hole
 LL.....Live load
 LOL.....Layout line
 LONG.....Longitudinal
 LP.....Lamp post
 LPS.....Low pressure sodium (Light)
 LS.....Lump sum
 LTS.....Lime treated soil
 LWD.....Leucadia Wastewater District
 MAINT.....Maintenance
 MAX.....Maximum
 MCR.....Middle of curb return
 MEAS.....Measure
 MH.....Manhole, maintenance hole
 MIL SPEC.....Military specification
 MISC.....Miscellaneous
 MOD.....Modified, modify
 MON.....Monument
 MSL.....Mean Sea Level (Reg. Standard Drawing M-12)
 MTBM.....Microtunneling Boring Machine
 MULT.....Multiple
 MUTCD.....Manual on Uniform Traffic Control Devices
 MVL.....Mercury vapor light
 NCTD.....North County Transit District
 NRCP.....Nonreinforced concrete pipe
 OBS.....Obsolete
 OC.....On center
 OD.....Outside diameter
 OE.....Outer edge
 OHE.....Overhead Electric
 OMWD.....Olivenhain Municipal Water District
 OPP.....Opposite

ORIG.....Original
 PB.....Pull box
 PC.....Point of curvature
 PCC.....Portland cement concrete or point
 of compound curvature
 PCVC.....Point of compound vertical curve
 PE.....Polyethylene
 PI.....Point of intersection
 PL.....Property line
 PMB.....Processed miscellaneous base
 POC.....Point on curve
 POT.....Point on tangent
 PP.....Power pole
 PRC.....Point of reverse curve
 PRVC.....Point of reverse vertical curve
 PSI.....Pounds per square inch
 PT.....Point of tangency
 PVC.....Polyvinyl chloride
 PVMT.....Pavement
 PVT R/W.....Private right-of-way
 Q.....Rate of flow in cubic feet per second
 QUAD.....Quadrangle, Quadrant
 R.....Radius
 R&O.....Rock and oil
 R/W.....Right-of-way
 RA.....Recycling agent
 RAC.....Recycled asphalt concrete
 RAP.....Reclaimed asphalt pavement
 RBAC.....Rubberized asphalt concrete
 RC.....Reinforced concrete
 RCB.....Reinforced concrete box
 RCE.....Registered civil engineer
 RCP.....Reinforced concrete pipe
 RCV.....Remote control valve
 REF.....Reference
 REINF.....Reinforced or reinforcement
 RES.....Reservoir
 RGE.....Registered geotechnical engineer
 ROW.....Right-of-Way
 RR.....Railroad
 RSE.....Registered structural engineer
 RTE.....Registered traffic engineer
 S.....Sewer or Slope, as applicable
 SCCP.....Steel cylinder concrete pipe
 SD.....Storm drain
 SDNR.....San Diego Northern Railway
 SDR.....Standard thermoplastic pipe dimension ratio
 (ratio of pipe O.D. to minimum wall thickness)
 SDRSD.....San Diego Regional Standard Drawings
 SE.....Sand Equivalent
 SEC.....Section
 SF.....Square foot
 SFM.....Sewer Force Main
 SI.....International System of Units (Metric)
 SPEC.....Specifications
 SPPWC.....Standard Plans for
 Public Works Construction
 ST HWY.....State highway
 STA.....Station
 STD.....Standard
 STR.....Straight
 STR GR.....Straight grade



STRUC..... Structural/Structure
 SW Sidewalk
 SWD..... Sidewalk drain
 SY Square yard
 T Telephone
 TAN..... Tangent
 TC Top of curb
 TEL Telephone
 TF..... Top of footing
 TOPO..... Topography
 TR Tract
 TRANS..... Transition
 TS Traffic signal or transition structure
 TSC..... Traffic signal conduit
 TSS..... Traffic signal standard
 TW Top of wall
 TYP Typical

UE Underground Electric
 USA..... Underground Service Alert
 VAR..... Varies, Variable
 VB Valve box
 VC Vertical curve
 VCP..... Vitrified clay pipe
 VERT Vertical
 VOL..... Volume
 VWD..... Vallecitos Water District
 W..... Water, Wider or Width, as applicable
 WATCH..... Work Area Traffic Control Handbook
 WI..... Wrought iron
 WM..... Water meter
 WPJ Weakened plane joint
 XCONN Cross connection
 XSEC Cross section

1-3.3 Institutions.

Abbreviation

Word or Words

AASHTO American Association of State Highway and Transportation Officials
 AISC..... American Institute of Steel Construction
 ANSI..... American National Standards Institute
 API American Petroleum Institute
 AREA American Railway Engineering Association
 ASTM American Society for Testing and Materials
 AWPA..... American Wood Preservers Association
 AWS..... American Welding Society
 AWWA..... American Water Works Association
 FHWA..... Federal Highway Administration
 GRI..... Geosynthetic Research Institute
 NEMA..... National Electrical Manufacturers Association
 NOAA..... National Oceanic and Atmospheric Administration (Dept. of Commerce)
 UL Underwriters' Laboratories Inc.
 USGS..... United States Geological Survey

1-4 UNITS OF MEASURE.

1-4.1 General. U.S. Standard Measures, also called U.S. Customary System, are the principal measurement system in these specifications. However, certain material specifications and test requirements contained herein use SI units specifically and conversions to U.S. Standard Measures may or may not have been included in these circumstances. When U.S. Standard Measures are not included in parenthesis, then the SI units shall control. S.I. units and U.S. Standard Measures in parenthesis may or may not be exactly equivalent.

Reference is also made to ASTM E 380 for definitions of various units of the SI system and a more extensive set of conversion factors.



1-4.2 Units of Measure and Their Abbreviations.

U.S. Customary Unit (Abbreviations)	(Equal To)	SI Unit (Abbreviations)
1 mil (=0.001 in)		25.4 micrometer (μm)
1 inch (in)		25.4 millimeter (mm)
1 inch (in)		2.54 centimeter (cm)
1 foot (ft)		0.3048 meter (m)
1 yard (yd)		0.9144 meter (m)
1 mile (mi)		1.6093 kilometer (km)
1 square foot (ft ²)		0.0929 square meter (m ²)
1 square yard (yd ²)		0.8361 square meter (m ²)
1 cubic foot (ft ³)		0.0283 cubic meter (m ³)
1 cubic yard (yd ³)		0.7646 cubic meter (m ³)
1 acre		0.4047 hectare (ha)
1 U.S. gallon (gal)		3.7854 Liter (L)
1 fluid ounce (fl. oz.)		29.5735 milliliter (mL)
1 pound mass (lb) (avoirdupois)		0.4536 kilogram (kg)
1 ounce mass (oz)		0.02835 kilogram (kg)
1 Ton (=2000 lb avoirdupois)		0.9072 Tonne (= 907 kg)
1 Poise		0.1 pascal · second (Pa · s)
1 centistoke (cs)		1 square millimeters per second (mm ² /s)
1 pound force (lbf)		4.4482 Newton (N)
1 pounds per square inch (psi)		6.8948 Kilopascal (kPa)
1 pound force per foot (lbf/ft)		1.4594 Newton per meter (N/m)
1 foot-pound force (ft-lbf)		1.3558 Joules (J)
1 foot-pound force per second ([ft-lbf]/s)		1.3558 Watt (W)
1 part per million (ppm)		1 milligram/liter (mg/L)

Temperature Units and Abbreviations

Degree Fahrenheit (°F):	Degree Celsius (°C):
°F = (1.8 x °C) + 32	°C = (°F – 32)/1.8

SI Units (abbreviation) Commonly Used in Both Systems

1 Ampere (A)
 1 Volt (V)
 1 Candela (cd)
 1 Lumen (lm)
 1 second (s)

Common Metric Prefixes

kilo (k)	10 ³
centi (c)	10 ⁻²
milli (m)	10 ⁻³
micro (μ)	10 ⁻⁶
nano (n)	10 ⁻⁹
pico (p)	10 ⁻¹²

1-5 SYMBOLS

Δ	Delta, the central angle or angle between tangents
∠	Angle
%	Percent
'	Feet or minutes
"	Inches or seconds
1	Number
/	per or (between words)
°	Degree
PL	Property line
CL	Centerline
SL	Survey line or station line



SECTION 2 – SCOPE AND CONTROL OF WORK

2-1 AWARD AND EXECUTION OF CONTRACT. Award and execution of Contract will be as provided for in the Specifications, Instruction to Bidders, or Notice Inviting Bids.

2-2 ASSIGNMENT. No Contract or portion thereof may be assigned without consent of the Board, except that the Contractor may assign money due or which will accrue to it under the Contract. If given written notice, such assignment will be recognized by the Board to the extent permitted by law. Any assignment of money shall be subject to all proper withholdings in favor of the Agency and to all deductions provided for in the Contract. All money withheld, whether assigned or not, shall be subject to being used by the Agency for completion of the Work, should the Contractor be in default.

2-3 SUBCONTRACTS.

2-3.1 General. Each Bidder shall comply with the Chapter of the Public Contract Code including Sections 4100 through 4113. The following excerpts or summaries of some of the requirements of this Chapter are included below for information:

The Bidder shall set forth in the Bid, as provided in 4104:

“(a) The name and location of the place of business of each subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvements, or a subcontractor licensed by the State of California who, under subcontract to the prime contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of 1 percent of the prime contractor’s total bid, or, in the case of bids or offers for the construction of streets or highways, including bridges, in excess of one-half of 1 percent of the prime contractor’s total bid or ten thousand dollars (\$10,000), whichever is greater.”

“(b) The portion of the work which will be done by each such subcontractor under this act. The prime contractor shall list only one subcontractor for each such portion as is defined by the prime contractor in his bid.”

If the Contractor fails to specify a Subcontractor or specifies more than one Subcontractor for the same portion of the work to be performed under the Contract (in excess of one-half of 1 percent of the Contractor’s total Bid), the Contractor shall be qualified to perform that portion itself, and shall perform that portion itself, except as otherwise provided in the Code.

As provided in Section 4107, no Contractor whose Bid is accepted shall substitute any person as Subcontractor in place of the Subcontractor listed in the original Bid, except for causes and by procedures established in Section 4107.5. This section provides procedures to correct a clerical error in the listing of a Subcontractor.

Section 4110 provides that a Contractor violating any of the provisions of the Chapter violates the Contract and the Board may exercise the option either to cancel the Contract or assess the Contractor a penalty in an amount of not more than 10 percent of the subcontract involved, after a public hearing.



Should the Contractor fail to adhere to the provisions requiring the Contractor to complete **25 percent** of the contract price with its own organization, the Agency may at its sole discretion elect to cancel the contract or deduct an amount equal to 10 percent of the value of the work performed in excess of **25 percent** of the contract price by other than the Contractor's own organization. The Board shall be the sole body for determination of a violation of these provisions. In any proceedings under this section, the prime contractor shall be entitled to a public hearing before the Board and shall be notified ten (10) days in advance of the time and location of said hearing. The determination of the City Council shall be final.

2-3.2 Additional Responsibility. The Contractor shall give personal attention to the fulfillment of the Contract and shall keep the Work under its control.

The Contractor shall perform, with its own organization, Contract work amounting to at least **25 percent** of the Contract Price except that any designated "Specialty Items" may be performed by subcontract, and the amount of any such "Specialty Items" so performed may be deducted from the Contract Price before computing the amount required to be performed by the Contractor with its own organization. "Specialty Items" will be identified by the Agency in the Bid or Proposal. Where an entire item is subcontracted, the value of work subcontracted will be based on the Contract Unit Price. When a portion of an item is subcontracted, the value of work subcontracted will be based on the estimated percentage of the Contract Unit Price. This will be determined from information submitted by the Contractor, and subject to approval by the Engineer.

Before the work of any Subcontractor is started, the Contractor shall submit to the Engineer for approval a written statement showing the work to be subcontracted giving the name and business of each Subcontractor and description and value of each portion of the work to be so subcontracted.

2-3.3 Status of Subcontractors. Subcontractors shall be considered employees of the Contractor, and the Contractor shall be responsible for their work.

2-4 CONTRACT BONDS. Before execution of the Contract, the Bidder shall file surety bonds with the Agency to be approved by the Board in the amounts and for the purposes noted below. Bonds issued by a surety, who is authorized to issue bonds in California, and whose bonding limitation shown in said circular is sufficient to provide bonds in the amount required by the Contract shall be deemed to be approved unless specifically rejected by the Agency. Bonds from all other sureties shall be accompanied by all of the documents enumerated in Code of Civil Procedure 995.660 (a). The Bidder shall pay all bond premiums, costs, and incidentals.

Each bond shall incorporate, by reference, the Contract and be signed by both the Bidder and Surety and the signature of the authorized agent of the Surety shall be notarized.

The Contractor shall provide a faithful performance/warranty bond and payment bond (labor and materials bond) for this contract. The faithful performance/warranty bond shall be in a sum not less than one hundred percent of the total amount payable by the terms of this contract. The Contractor shall provide bonds to secure payment of laborers and materials suppliers in a sum not less than one hundred percent of the total amount payable by the terms of this contract.

Both bonds shall extend in full force and effect and be retained by the Agency during this project until they are released according to the provisions of this section.



The faithful performance/warranty bond will be reduced to 25 percent of the original amount 30 days after recordation of the Notice of Completion and will remain in full force and effect for the one year warranty period and until all warranty repairs are completed to the satisfaction of the Engineer. The bonds to secure payment of laborers and materials suppliers shall be released six months plus 30 days after recordation of the Notice of Completion if all claims have been paid.

All bonds are to be placed with a surety insurance carrier admitted and authorized to transact the business of insurance in California and whose assets exceed their liabilities in an amount equal to or in excess of the amount of the bond. The bonds are to contain the following documents:

- 1) An original, or a certified copy, of the un-revoked appointment, power of attorney, by laws, or other instrument entitling or authorizing the person who executed the bond to do so.
- 2) A certified copy of the certificate of authority of the insurer issued by the insurance commissioner.

If the bid is accepted, the Agency may require a financial statement of the assets and liabilities of the insurer at the end of the quarter calendar year prior to 30 days next preceding the date of the execution of the bond. The financial statement shall be made by an officer's certificate as defined in Section 173 of the Corporations Code. In the case of a foreign insurer, the financial statement may be verified by the oath of the principal officer or manager residing within the United States.

Should any bond become insufficient, the Contractor shall renew the bond within 10 days after receiving notice from the Agency.

Should any Surety at any time be unsatisfactory to the Board, notice will be given the Contractor to that effect. No further payments shall be deemed due or will be made under the contract until a new Surety shall qualify and be accepted by the Board.

Changes in the Work or extensions of time, made pursuant to the Contract, shall in no way release the Contractor or Surety from its obligations. Notice of such changes or extensions shall be waived by the Surety.

2-5 PLANS AND SPECIFICATIONS.

2-5.1 General. The Contractor shall keep at the Work site a copy of the Plans and Specifications, to which the Engineer shall have access at all times.

The specifications for the work include the General Provisions; project Technical Specifications; Carlsbad Engineering Standards (CES), and the Standard Specifications for Public Works Construction, (SSPWC), Part 2 & 3, and the latest supplements thereto, current edition at the time of bid opening as published by the "Greenbook" Committee of Public Works Standards, Inc., hereinafter designated "SSPWC", as amended.

The construction plans consist of Calavera Hills Community Park Gateway Improvements plans, City Project No. 4601, 1 set. If applicable, the standard drawings used for this project are the latest edition of the San Diego Area Regional Standard Drawings, hereinafter designated SDRSD, as issued by the San Diego County Department of Public Works, together with the most recent editions of the City of Carlsbad Engineering Standards and Carlsbad Standard Drawings, as issued by the City of Carlsbad and the Carlsbad Municipal Water District, hereinafter designated as CES and CSD, respectively. Copies of some of the pertinent standard drawings are enclosed as an appendix to these General Provisions.



The Plans, Specifications, and other Contract Documents shall govern the Work. The Contract Documents are intended to be complementary and cooperative. Anything specified in the Specifications and not shown on the Plans or shown on the Plans and not specified in the Specifications, shall be as though shown on or specified in both.

The Plans shall be supplemented by such working drawings and shop drawings as are necessary to adequately control the Work.

The Contractor shall ascertain the existence of any conditions affecting the cost of the Work through a reasonable examination of the Work site prior to submitting the Bid.

Existing improvements visible at the Work site, for which no specific disposition is made on the Plans, but which interfere with the completion of the Work, shall be removed and disposed of by the Contractor.

The Contractor shall, upon discovering any error or omission in the Plans or Specifications, immediately call it to the attention of the Engineer.

2-5.2 Precedence of Contract Documents.

If there is a conflict between Contract Documents, the document highest in precedence shall control. The precedence shall be the most recent edition of the following documents listed in order of highest to lowest precedence:

- 1) Permits from other agencies as may be required by law.
- 2) Change orders, whichever occurs last.
- 3) CSI Formatted Technical Specifications
- 4) Contract addenda, whichever occurs last.
- 5) Contract
- 6) Project Plans
- 7) Carlsbad General Provisions, Technical Specifications, and Supplemental Provisions.
- 8) Standards plans.
 - a) City of Carlsbad Standard Drawings.
 - b) Carlsbad Municipal Water District Standard Drawings.
 - c) City of Carlsbad modifications to the San Diego Area Regional Standard Drawings.
 - d) San Diego Area Regional Standard Drawings.
- 9) Standard Specifications for Public Works Construction, as amended.
- 10) Reference Specifications.
- 11) Manufacturer's Installation Recommendations

Detail drawings shall take precedence over general drawings.

Change Orders, Supplemental Agreements and approved revisions to Plans and Specifications will take precedence over items 2) through 9) above. Detailed plans and plan views shall have precedence over general plans.

2-5.3 Submittals.

2-5.3.1 General. Submittals shall be provided, at the Contractor's expense, as required in 2-5.3.2, 2-5.3.3 and 2-5.3.4, when required by the Plans or Special Provisions, or when requested by the Engineer.



Materials shall neither be furnished nor fabricated, nor shall any work for which submittals are required be performed, before the required submittals have been reviewed and accepted by the Engineer. Neither review nor acceptance of submittals by the Engineer shall relieve the Contractor from responsibility for errors, omissions, or deviations from the Contract Documents, unless such deviations were specifically called to the attention of the Engineer in the letter of transmittal. The Contractor shall be responsible for the correctness of the submittals.

The Contractor shall allow a minimum of 20 working days for review of submittals unless otherwise specified in the Special Provisions. Each submittal shall be accompanied by a letter of transmittal.

Each submittal shall be consecutively numbered. Resubmittals shall be labeled with the number of the original submittal followed by an ascending alphabetical designation (e.g. The label '4-C' would indicate the third instance that the fourth submittal had been given to the Engineer). Each sheet of each submittal shall be consecutively numbered. Each set of shop drawings and submittals shall be accompanied by a letter of transmittal on the Contractor's letterhead. The Letter of Transmittal shall contain the following:

- 1) Project title and Agency contract number.
- 2) Number of complete sets.
- 3) Contractor's certification statement.
- 4) Specification section number(s) pertaining to material submitted for review.
- 5) Submittal number (Submittal numbers shall be consecutive including subsequent submittals for the same materials.)
- 6) Description of the contents of the submittal.
- 7) Identification of deviations from the contract documents.

When submitted for the Engineer's review, Shop Drawings shall bear the Contractor's certification that the Contractor has reviewed, checked, and approved the Shop Drawings and that they are in conformance with the requirements of the Contract Documents. The Contractor shall subscribe to and shall place the following certification on all submittals:

"I hereby certify that the (equipment, material) shown and marked in this submittal is that proposed to be incorporated into this Project, is in compliance with the Contract Documents, can be installed in the allocated spaces, and is submitted for approval."

By: _____ Title: _____

Date: _____

Company Name: _____

2-5.3.2 Working Drawings. Working drawings are drawings showing details not shown on the Plans which are required to be designed by the Contractor. Working drawings shall be of a size and scale to clearly show all necessary details.

Six copies and one reproducible shall be submitted. If no revisions are required, three of the copies will be returned to the Contractor. If revisions are required, the Engineer will return one copy along with the reproducible for resubmission. Upon acceptance, the Engineer will return two of the copies to the Contractor and retain the remaining copies and the reproducible.



Working drawings are required in the following sections:

TABLE 2-5.3.2 (A)

Item	Section Number	Title	Subject
1	7-10.4.1	Safety Orders	Trench Shoring
2	207-2.5	Joints	Reinforced Concrete Pipe
3	207-8.4	Joints	Vitrified Clay Pipe
4	207-10.2.1	General	Fabricated Steel Pipe
5	300-3.2	Cofferdams	Structure Excavation & Backfill
6	303-1.6.1	General	Falsework
7	303-1.7.1	General	Placing Reinforcement
8	303-3.1	General	Prestressed Concrete Construction
9	304-1.1.1	Shop Drawings	Structural Steel
10	304-1.1.2	Falsework Plans	Structural Steel
11	304-2.1	General	Metal Hand Railings
12	306-2.1	General	Jacking Operations
13	306-3.1	General	Tunneling Operations
14	306-3.4	Tunnel Supports	Tunneling Operations
15	306-6	Remodeling Existing Sewer Facilities	Polyethylene Liner Installation
16	306-8	Microtunneling	Microtunneling Operations
17	307-4.3	Controller Cabinet Wiring Diagrams	Traffic Signal Construction

Working drawings listed above as Items 5, 6, 8, 9, 10, 12, 13, 14 and 16 shall be prepared by a Civil or Structural Engineer registered by the State of California.

2-5.3.3 Shop Drawings. Shop drawings are drawings showing details of manufactured or assembled products proposed to be incorporated into the Work. Shop drawings required shall be as specified in the Special Provisions.

2-5.3.4 Supporting Information. Supporting information is information required by the Specifications for the purposes of administration of the Contract, analysis for verification of conformance with the Specifications, the operation and maintenance of a manufactured product or system to be constructed as part of the Work, and other information as may be required by the Engineer. Six copies of the supporting information shall be submitted to the Engineer prior to the start of the Work unless otherwise specified in the Special Provisions or directed by the Engineer. Supporting information for systems shall be bound together and include all manufactured items for the system. If resubmittal is not required, three copies will be returned to the Contractor. Supporting information shall consist of the following and is required unless otherwise specified in the Special Provisions:

- 1) List of Subcontractors per 2-3.2.
- 2) List of Materials per 4-1.4.
- 3) Certifications per 4-1.5.
- 4) Construction Schedule per 6-1.
- 5) Confined Space Entry Program per 7-10.4.4.
- 6) Concrete mix designs per 201-1.1.
- 7) Asphalt concrete mix designs per 203-6.1.
- 8) Data, including, but not limited to, catalog sheets, manufacturer's brochures, technical bulletins, specifications, diagrams, product samples, and other information necessary to describe a system, product or item. This information is required for irrigation systems, street lighting systems, and traffic signals, and may also be required for any product, manufactured item, or system.



2-5.4 Record Drawings. The Contractor shall provide and keep up-to-date a complete "as-built" record set of blue-line prints, which shall be corrected in red daily and show every change from the original drawings and specifications and the exact "as-built" locations, sizes and kinds of equipment, underground piping, valves, and all other work not visible at surface grade. The red-lined as-built record set shall be made available for monthly inspections by the City. Prints for this purpose may be obtained from the Agency at cost. This set of drawings shall be kept on the job and shall be used only as a record set and shall be delivered to the Engineer within ten (10) days of completion of the work. Payment for performing the work required by Section 2-5.4 shall be included in the contract **lump sum** price as shown in the bid schedule and shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals to accomplish the work as specified herein and no additional compensation shall be allowed.

2-6 WORK TO BE DONE. The Contractor shall perform all work necessary to complete the Contract in a satisfactory manner. Unless otherwise provided, the Contractor shall furnish all materials, equipment, tools, labor, and incidentals necessary to complete the Work.

2-7 SUBSURFACE DATA. All soil and test hole data, water table elevations, and soil analyses shown on the drawings or included in the Specifications apply only at the location of the test holes and to the depths indicated. Soil test reports for test holes which have been drilled are available for inspection at the office of the Engineer. Any additional subsurface exploration shall be done by Bidders or the Contractor at their own expense.

The indicated elevation of the water table is that which existed on the date when test hole data was determined. It is the Contractor's responsibility to determine and allow for the elevation of groundwater at the date of project construction. A difference in elevation between groundwater shown in soil boring logs and groundwater actually encountered during construction will not be considered as a basis for extra work.

2-8 RIGHT-OF-WAY. Rights-of-way, easements, or rights-of-entry for the Work will be provided by the Agency. Unless otherwise provided, the Contractor shall make arrangements, pay for, and assume all responsibility for acquiring, using, and disposing of additional work areas and facilities temporarily required. The Contractor shall indemnify and hold the Agency harmless from all claims for damages caused by such actions.

2-9 SURVEYING.

2-9.1 Permanent Survey Markers. The Contractor shall not cover or disturb permanent survey monuments or benchmarks without the consent of the Engineer. Where the Engineer concurs, in writing, with the Contractor that protecting an existing monument in place is impractical, the Contractor shall employ a licensed land surveyor or a registered civil engineer authorized to practice land surveying within the State of California, hereinafter Surveyor, to establish the location of the monument before it is disturbed. The Contractor shall have the monument replaced by the Surveyor no later than thirty (30) days after construction at the site of the replacement is completed. The Surveyor shall file corner record(s) as required by §§ 8772 and 8773, et seq. of the California Business and Professions Code.

When a change is made in the finished elevation of the pavement of any roadway in which a permanent survey monument is located, the Contractor shall adjust the monument frame and cover to the new grade within 7 days of paving unless the Engineer shall approve otherwise.



Monument frames and covers shall be protected during street sealing or painting projects or be cleaned to the satisfaction of the Engineer.

2-9.2 Survey Service. The Contractor shall hire and pay for the services of a Surveyor, hereinafter Surveyor to perform all work necessary for establishing control, construction staking, records research and all other surveying work necessary to construct the work, provide surveying services as required herein and provide surveying, drafting and other professional services required to satisfy the requirements of the Land Surveyors Act. Surveyor shall be resident on the site during all surveying operations and shall personally supervise and certify the surveying work.

2-9.2.1 Submittal of Surveying Data. All surveying data submittals shall conform to the requirements of Section 2-5.3.3, "Submittals", herein. The Contractor shall submit grade sheets to the Engineer before commencing work in the area affected by the grade sheets. The Contractor shall submit field notes for all surveying required herein to the Engineer within ten days of performing the survey. All surveying field notes, grade sheets and survey calculations shall be submitted in bound form on 215mm by 280 mm (8½" by 11") paper. The field notes, calculations and supporting data shall be clear and complete. Supporting data shall include all maps, affidavits, plats, field notes from earlier surveys and all other evidence used by the Surveyor to determine the location of the monuments set. The field notes and calculations will be labeled with name of the Surveyor, the party chief, the field crewmembers and the author of the field notes or calculations. They shall be annotated with the date of observation or calculation, be numbered with consecutive page numbers and shall be readable without resort to any electronic aid, computer program or documentation for any computer program. The field notes shall be prepared in conformance with the CALTRANS "Surveys Manual". The Contractor shall have a Record of Survey prepared by the Surveyor and file it in conformance with §§ 8700 - 8805 of the State of California Business and Professions Code when the Surveyor performs any surveying that such map is required under §§ 8762 of the State of California Business and Professions Code and whenever the Surveyor shall establish, set or construct any permanent survey monument. SDRS drawing M-10 type monuments, bolts, spikes, leaded tacks and nails (when set in concrete), iron pipes, reinforcing steel and all monuments and marks that are at, or accessory to, property corners and street centerlines are permanent survey monuments. The Record of Survey shall show all monuments set, control monuments used, the basis of bearings and all other data needed to determine the procedure of survey and the degree of accuracy attained by the field surveying including the unadjusted ratio of closure. The unadjusted ratio of closure shall not exceed 1 part in 40,000. The record of survey shall show the location and justification of location of all permanent monuments set and their relation to the street right-of-way. Record(s) of Survey(s) shall be submitted for the Engineer's review and approval before submittal to the County Surveyor and before submittal to the County Recorder.

2-9.2.2 Survey Requirements, Stakes shall be set at offsets approved by the Engineer at no greater intervals than specified in TABLE 2-9.2.2(A) as measured along the project stationing. Stakes shall be set to show the location and grade of future curbs adjacent to traffic signal locations where the curb is not being built as a part of this contract. Staking and marking shall be completed by the Surveyor and inspected and approved by the Engineer before the start of construction in the area marked. Centerline monument shall have the disk stamped with the date the monument was set and the registration number of the Surveyor. Habitat mitigation sites and other areas to be preserved that are shown on the plans shall be staked and flagged prior to the start of any other activities within the limits of the work. When curb and gutter does not exist, and is not being installed as a part of the project the location of adjacent facilities being constructed as a part of the contract the Contractor shall place stakes defining the horizontal and vertical location



of such adjacent utility vaults, poles or other facilities that are being installed as parts of, or adjunct to, the project either by the Contractor and/or those noted on the plans as to be installed by others.

TABLE 2-9.2.2(A)
Survey Requirements for Construction Staking

Feature Staked	Stake Description ②	Centerline or Parallel to Centerline Spacing④, ⑥	Lateral Spacing ③, ⑥	Setting Tolerance (Within)
Street Centerline	SDRS M-10 Monument	≤1000', Street Intersections, Begin and end of curves, only when shown on the plans	on street centerline	0.02' Horizontal, also see Section 2-9.2.1 herein
Clearing	Lath in soil, painted line on PCC & AC surfaces	lath - Intervisible, ≤ 50' on tangents & ≤ 25' on curves, Painted line - continuous	at clearing line	1' Horizontal
Slope	RP + Marker Stake	Intervisible and ≤ 50'	Grade Breaks & ≤ 25'	0.1' Vertical & Horizontal
Fence	RP + Marker Stake	≤ 200' on tangents, ≤ 50' on curves when R ≥ 1000' & 25' on curves when R ≤ 1000'	N/A (constant off-set)	0.1' Horizontal
Rough Grade Cuts or Fills ≥ 10 m (33')	RP + Marker Stake	≤ 50'	N/A	0.1' Vertical & Horizontal
Final Grade (includes top of: Basement soil, subbase and base)	RP + Marker Stake, Blue-top in grading area	≤ 50' on tangents & curves when R ≥ 1000' & ≤ 25' on curves when R ≤ 1000'	≤ 22'	3/8" Horizontal & 1/4" Vertical
Asphalt Pavement Finish Course	RP, paint on previous course	≤ 25' or as per the intersection grid points shown on the plan whichever provides the denser information	edge of pavement, paving pass width, crown line & grade breaks	3/8" Horizontal & 1/4" Vertical
Drainage Structures, Pipes & similar Facilities①, ⑦	RP + Marker Stake	intervisible & ≤ 25', beginning and end, BC & EC of facilities, Grade breaks, Alignment breaks, Junctions, Inlets & similar facilities, Risers & similar facilities (except plumbing), Skewed cut-off lines	as appropriate	3/8" Horizontal & 1/4" Vertical
Curb	RP + Marker Stake	≤ 25', BC & EC, at 1/4Δ, 1/2Δ & 3/4Δ on curb returns & at beginning & end	(constant off-set)	3/8" Horizontal & 1/4" Vertical
Conduit ①	RP + Marker Stake	≤ 50' on tangents & curves when R ≥ 1000' & ≤ 25' on curves when R ≤ 1000' or where grade ≤ 0.30%	as appropriate	3/8" Horizontal & when depth cannot be measured from existing pavement 1/4" Vertical
Minor Structure ①	RP + Marker Stake + Line Stake	for catch basins: at centerline of box, ends of box & wings & at each end of the local depression ⑤	as appropriate	3/8" Horizontal & 1/4" Vertical (when vertical data needed)
Wall ①	RP + Marker Stake + Line Point + Guard Stake	≤ 50' and at beginning & end of: each wall, BC & EC, layout line angle points, changes in footing dimensions &/or elevation & wall height	as appropriate	1/4" Horizontal & 1/4" Vertical
Miscellaneous ⑤				
Contour Grading ①	RP + Marker Stake	≤ 50'	along contour line	0.1' Vertical & Horizontal
Utilities ①, ⑦	RP + Marker Stake	≤ 50' on tangents & curves when R ≥ 1000' & ≤ 25' on curves when R ≤ 1000' or where grade ≤ 0.30%	as appropriate	3/8" Horizontal & 1/4" Vertical



- ① Staking for feature may be omitted when adjacent marker stakes reference the offset and elevation of those features and the accuracy requirements of the RP meet the requirements for the feature
- ② Reference points shall be sufficiently durable and set securely enough to survive with accuracy intact throughout the installation & inspection of the features or adjacent facilities for which they provide control. RP means reference point for the purposes of this table
- ③ Perpendicular to centerline.
- ④ Some features are not necessarily parallel to centerline but are referenced thereto
- ⑤ Multi-plane surfaced features shall be staked so as to provide line & grade information for each plane of the feature
- ⑥ \geq means greater than, or equal to, the number following the symbol. \leq means less than, or equal to, the number following the symbol.
- ⑦ The cut datum for storm drainage & sanitary sewer pipes & similar structures shall be their invert. The cut datum for all other utilities shall be the top of their pipe or conduit.

All guard stakes, line stakes and lath shall be flagged. Unless otherwise approved by the Engineer flagging, paint and marking cards shall be the color specified in TABLE 2-9.2.2(B)

TABLE 2-9.2.2(B)
Survey Stake Color Code for Construction Staking

Type of Stake	Description	Color*
Horizontal Control	Coordinated control points, control lines, control reference points, centerline, alignments, etc.	White/Red
Vertical Control	Bench marks	White/Orange
Clearing	Limits of clearing	Yellow/Black
Grading	Slope, intermediate slope, abutment fill, rough grade, contour grading, final grade, etc.	Yellow
Structure	Bridges, sound and retaining walls, box culverts, etc.	White
Drainage, Sewer, Curb	Pipe culverts, junction boxes, drop inlets, headwalls, sewer lines, storm drains, slope protection, curbs, gutters, etc.	Blue
Right-of-Way	Fences, R/ W lines, easements, property monuments, etc.	White/Yellow
Miscellaneous	Signs, railings, barriers, lighting, etc.	Orange

* Flagging and marking cards, if used.

2-9.2.3 Payment for Survey, Payment for work performed to satisfy the requirements of Sections 2-9.1 through 2-9.2.2 shall be included in the contract **lump sum** price as shown in the bid schedule and shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals to accomplish the work as specified herein and no additional compensation shall be allowed. Extension of unit prices for extra work shall include full compensation for attendant survey work and no additional payment will be made. Payment for the replacement of disturbed monuments and the filing of records of survey and/or corner records, including filing fees, shall be incidental to the work necessitating the disturbance of said monuments and no additional payment will be made.

2-9.3 Private Engineers. Surveying by private engineers on the Work shall conform to the quality and practice required by the Engineer.

2-9.4 Line and Grade. All work shall conform to the lines, elevations, and grades shown on the Plans.

Three consecutive points set on the same slope shall be used together so that any variation from a straight grade can be detected. Any such variation shall be reported to the Engineer. In the absence of such report, the Contractor shall be responsible for any error in the grade of the finished work.



Grades for underground conduits will be set at the surface of the ground. The Contractor shall transfer them to the bottom of the trench.

2-10 AUTHORITY OF BOARD AND ENGINEER. The Board has the final authority in all matters affecting the Work. Within the scope of the Contract, the Engineer has the authority to enforce compliance with the Plans and Specifications. The Contractor shall promptly comply with instructions from the Engineer or an authorized representative.

The decision of the Engineer is final and binding on all questions relating to: quantities; acceptability of material, equipment, or work; execution, progress or sequence of work; and interpretation of the Plans, Specifications, or other drawings. This shall be precedent to any payment under the Contract, unless otherwise ordered by the Board.

2-10.1 Availability of Records, The Contractor shall, at no charge to the Agency, provide copies of all records in the Contractor's or subcontractor's possession pertaining to the work that the Engineer may request.

2-10.2 Audit and Inspection, Contractor agrees to maintain and/or make available, to the Engineer, within San Diego County, accurate books and accounting records relative to all its activities and to contractually require all subcontractors to this Contract to do the same. The Engineer shall have the right to monitor, assess, and evaluate Contractor's and its subcontractors' performance pursuant to this Agreement, said monitoring, assessments, and evaluations to include, but not be limited to, audits, inspection of premises, reports, contracts, subcontracts and interviews of Contractor's staff and the staff of all subcontractors to this contract. At any time during normal business hours and as often as the Engineer may deem necessary, upon reasonable advance notice, Contractor shall make available to the Engineer for examination, all of its, and all subcontractors to this contract, records with respect to all matters covered by this Contract and will permit the Engineer to audit, examine, copy and make excerpts or transcripts from such data and records, and to make audits of all invoices, materials, payrolls, records of personnel, and other data relating to all matters covered by this Contract. However, any such activities shall be carried out in a manner so as to not unreasonably interfere with Contractor's ongoing business operations. Contractor and all subcontractors to this contract shall maintain such data and records for as long as may be required by applicable laws and regulations.

2-11 INSPECTION. The Work is subject to inspection and approval by the Engineer. The Contractor shall notify the Engineer before noon of the working day before inspection is required. Work shall be done only in the presence of the Engineer, unless otherwise authorized. Any work done without proper inspection will be subject to rejection. The Engineer and any authorized representatives shall at all times have access to the Work during its construction at shops and yards as well as the project site. The Contractor shall provide every reasonable facility for ascertaining that the materials and workmanship are in accordance with these specifications. Inspection of the Work shall not relieve the Contractor of the obligation to fulfill all conditions of the Contract.



SECTION 3 – CHANGES IN WORK

3-1 CHANGES REQUESTED BY THE CONTRACTOR.

3-1.1 General. Changes in the Plans and Specifications, requested in writing by the Contractor, which do not materially affect the Work and which are not detrimental to the Work or to the interests of the Agency, may be granted by the Engineer. Nothing herein shall be construed as granting a right to the Contractor to demand acceptance of such changes.

3-1.2 Payment for Changes Requested by the Contractor. If such changes are granted, they shall be made at a reduction in cost or no additional cost to the Agency.

3-2 CHANGES INITIATED BY THE AGENCY.

3-2.1 General. The Agency may change the Plans, Specifications, character of the work, or quantity of work provided the total arithmetic dollar value of all such changes, both additive and deductive, does not exceed 25 percent of the Contract Price. Should it become necessary to exceed this limitation, the change shall be by written Supplemental Agreement between the Contractor and Agency, unless both parties agree to proceed with the change by Change Order.

Change Orders shall be in writing and state the dollar value of the change or established method of payment, any adjustment in contract time of completion, and when negotiated prices are involved, shall provide for the Contractor's signature indicating acceptance.

3-2.2 Payment.

3-2.2.1 Contract Unit Prices. If a change is ordered in an item of work covered by a Contract Unit Price, and such change does not involve substantial change in character of the work from that shown on the Plans or specified in the Specifications, then an adjustment in payment will be made. This adjustment will be based upon the increase or decrease in quantity and the Contract Unit Price.

If the actual quantity of an item of work covered by a Contract Unit Price and constructed in conformance with the Plans and Specifications varies from the Bid quantity by 50 percent or less, payment will be made at the Contract Unit Price. If the actual quantity of said item of work varies from the Bid quantity by more than 50 percent, payment will be made per Section 3-2.2.2 or 3-2.2.3 as appropriate.

If a change is ordered in an item of work covered by a Contract Unit Price, and such change does involve a substantial change in the character of the work from that shown on the Plans or specified in the Specifications, an adjustment in payment will be made per Section 3-2.4.

3-2.2.2 Increases of More Than 50 Percent. Should the actual quantity of an item of work covered by a Contract Unit Price and constructed in conformance with the Plans and Specifications, exceed the Bid quantity by more than 50 percent, payment for the quantity in excess of 150 percent of the Bid quantity will be made on the basis of an adjustment in the Contract Unit Price mutually agreed to by the Contractor and the Agency, or at the option of the Engineer, on the basis of Extra Work per Section 3-3. The Extra Work per Section 3-3, basis of payment, shall not include fixed costs. Fixed costs shall be deemed to have been recovered by the Contractor through payment for 150 percent of the Bid quantity at the Contract Unit Price.



3-2.2.3 Decreases of More Than 50 Percent. Should the actual quantity of an item of work covered by a Contract Unit Price, and constructed in conformance with the Plans and Specifications, be less than 50 percent of the Bid quantity, an adjustment in payment will not be made unless so requested in writing by the Contractor. If the Contractor so requests, payment will be made on the basis of an adjustment in the Contract Unit Price mutually agreed to by the Contractor and the Agency, or at the option of the Engineer, on the basis of Extra Work per Section 3-3; however, in no case will payment be less than would be made for the actual quantity at the Contract Unit Price nor more than would be made for 50 percent of the Bid quantity at the Contract Unit Price.

3-2.3 Stipulated Unit Prices. Stipulated Unit Prices are unit prices established by the Agency in the Contract Documents as distinguished from Contract Unit Prices submitted by the Contractor. Stipulated Unit Prices may be used for the adjustment of Contract changes when so specified in the Special Provisions.

3-2.4 Agreed Prices. Agreed Prices are prices for new or unforeseen work, or adjustments in Contract Unit Prices per Section 3-2.2, established by mutual agreement between the Contractor and the Agency. If mutual agreement cannot be reached, the Engineer may direct the Contractor to proceed on the basis of Extra Work in accordance per Section 3-3, except as otherwise specified in Sections 3-2.2.2 and 3-2.2.3.

3.2.4.1 Schedule of Values. Prior to construction, Contractor shall provide a schedule of values for all lump sum bid items that shall be used for the purpose of progress payments. The prices shall be valid for the purpose of change orders to the project.

3.2.5 Eliminated Items. Should any Bid item be eliminated in its entirety, payment will be made to the Contractor for its actual costs incurred in connection with the eliminated item prior to notification in writing from the Engineer so stating its elimination. If material conforming to the Plans and Specifications is ordered by the Contractor for use in the eliminated item prior to the date of notification of elimination by the Engineer, and if the order for that material cannot be canceled, payment will be made to the Contractor for the actual cost of the material. In this case, the material shall become the property of the Agency. Payment will be made to the Contractor for its actual costs for any further handling. If the material is returnable, the material shall be returned and payment will be made to the Contractor for the actual cost of charges made by the supplier for returning the material and for handling by the Contractor. Actual costs, as used herein, shall be computed on the basis of Extra Work per Section 3-3.

3-3 EXTRA WORK.

3-3.1 General. New or unforeseen work will be classified as “extra work” when the Engineer determines that it is not covered by Contract Unit Prices or stipulated unit prices.

3-3.2 Payment.

3-3.2.1 General. When the price for the extra work cannot be agreed upon, the Agency will pay for the extra work based on the accumulation of costs as provided herein.



3-3.2.2 Basis for Establishing Costs.

(a) **Labor.** The costs of labor will be the actual cost for wages of workers performing the extra work at the time the extra work is done, plus employer payments of payroll taxes, workers compensation insurance, liability insurance, health and welfare, pension, vacation, apprenticeship funds, and other direct costs, resulting from Federal, State, or local laws, as well as assessments or benefits required by lawful collective bargaining agreements.

The use of a labor classification which would increase the extra work cost will not be permitted unless the Contractor establishes the necessity for such additional costs. Labor costs for equipment operators and helpers shall be reported only when such costs are not included in the invoice for equipment rental. The labor cost for foremen shall be proportioned to all of their assigned work and only that applicable to extra work will be paid.

Nondirect labor costs, including superintendence, shall be considered part of the markup of Section 3-3.2.3 (a).

(b) **Materials.** The cost of materials reported shall be at invoice or lowest current price at which such materials are locally available and delivered to the job site in the quantities involved, plus sales tax, freight, and delivery.

The Agency reserves the right to approve materials and sources of supply, or to supply materials to the Contractor if necessary for the progress of the Work. No markup shall be applied to any material provided by the Agency.

(c) **Tool and Equipment Rental.** No payment will be made for the use of tools which have a replacement value of \$200 or less.

Regardless of ownership, the rates and right-of-way delay factors to be used in determining rental and delay costs shall be the edition of the, "Labor Surcharge and Equipment Rental Rates" published by CALTRANS, current at the time of the actual use of the tool or equipment. The right-of-way delay factors therein shall be used as multipliers of the rental rates for determining the value of costs for delay to the Contractor and subcontractors, if any. The labor surcharge rates published therein are not a part of this contract.

The rental rates paid shall include the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals. Necessary loading and transportation costs for equipment used on the extra work shall be included.

If equipment is used intermittently and, when not in use, could be returned to its rental source at less expense to the Agency than holding it at the Work site, it shall be returned, unless the Contractor elects to keep it at the Work site, at no expense to the Agency.

All equipment shall be acceptable to the Engineer, in good working condition, and suitable for the purpose for which it is to be used. Manufacturer's ratings and approved modifications shall be used to classify equipment and it shall be powered by a unit of at least the minimum rating recommended by the manufacturer.



The reported rental time for equipment already at the Work site shall be the duration of its use on the extra work. This time begins when equipment is first put into actual operation on the extra work, plus the time required to move it from its previous site and back, or to a closer site.

(d) **Other Items.** The Agency may authorize other items which may be required on the extra work, including labor, services, material, and equipment. These items must be different in their nature from those required for the Work and be of a type not ordinarily available from the Contractor or Subcontractors.

Invoices covering all such items in detail shall be submitted with the request for payment.

(e) **Invoices.** Vendors' invoices for material, equipment rental and other expenditures shall be submitted with the request for payment. If the request for payment is not substantiated by invoices or other documentation, the Agency may establish the cost of the item involved at the lowest price which was current at the time of the report.

3-3.2.3 Markup.

(a) **Work by Contractor.** The following percentages shall be added to the Contractor's costs and shall constitute the markup for all overhead and profits:

- 1) Labor 20
- 2) Materials 15
- 3) Equipment Rental 15
- 4) Other Items and Expenditures ... 15

To the sum of the costs and markups provided for in this section, 1 percent shall be added as compensation for bonding.

(b) **Work by Subcontractor.** When all or any part of the extra work is performed by a Subcontractor, the markup established in Section 3-3.2.3(a) shall be applied to the Subcontractor's actual cost of such work. A markup of 10 percent on the first \$5,000 of the subcontracted portion of the extra work and a markup of 5 percent on work added in excess of \$5,000 of the subcontracted portion of the extra work may be added by the Contractor.

3-3.3 Daily Reports by Contractor. When the price for the extra work cannot be agreed upon, the Contractor shall submit a daily report to the Engineer on forms approved by the Agency. Included are applicable delivery tickets, listing all labor, materials, and equipment involved for that day, and other services and expenditures when authorized. Payment for extra work will not be made until such time that the Contractor submits completed daily reports and all supporting documents to the Engineer. Failure to submit the daily report by the close of the next working day may waive any rights for that day. An attempt shall be made to reconcile the report daily, and it shall be signed by the Engineer and the Contractor. In the event of disagreement, pertinent notes shall be entered by each party to explain points which cannot be resolved immediately. Each party shall retain a signed copy of the report. Reports by Subcontractors or others shall be submitted through the Contractor.

The report shall:

1. Show names of workers, classifications, and hours worked.
2. Describe and list quantities of materials used.
3. Show type of equipment, size, identification number, and hours of operation, including loading and transportation, if applicable.



4. Describe other services and expenditures in such detail as the Agency may require.

3-4 CHANGED CONDITIONS. The Contractor shall promptly notify the Engineer of the following Work site conditions (hereinafter called changed conditions), in writing, upon their discovery and before they are disturbed:

1. Subsurface or latent physical conditions differing materially from those represented in the Contract;
2. Unknown physical conditions of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in work of the character being performed; and
3. Material differing from that represented in the Contract which the Contractor believes may be hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

The Engineer will promptly investigate conditions which appear to be changed conditions. If the Engineer determines that conditions are changed conditions and they will materially affect performance time, the Contractor, upon submitting a written request, will be granted an extension of time subject to the provisions of 6-6.

If the Engineer determines that the conditions do not justify an adjustment in compensation, the Contractor will be notified in writing. This notice will also advise the Contractor of its obligation to notify the Engineer in writing if the Contractor disagrees.

The Contractor's failure to give notice of changed conditions promptly upon their discovery and before they are disturbed shall constitute a waiver of all claims in connection therewith.

The Contractor shall not be entitled to the payment of any additional compensation for any act, or failure to act, by the Engineer, including failure or refusal to issue a change order, or for the happening of any event, thing, occurrence, or other cause, unless the Contractor shall have first given the Engineer due written notice of potential claim as hereinafter specified. Compliance with this section shall not be required as a prerequisite to notice provisions in Section 6-7.3 Contract Time Accounting, nor to any claim that is based on differences in measurement or errors of computation as to contract quantities. The written notice of potential claim for changed conditions shall be submitted by the Contractor to the Engineer upon their discovery and prior to the time that the Contractor performs the work giving rise to the potential claim. The Contractor's failure to give written notice of potential claim for changed conditions to the agency upon their discovery and before they are disturbed shall constitute a waiver of all claims in connection therewith.

The Contractor shall provide the City with a written document containing a description of the particular circumstances giving rise to the potential claim, the reasons for which the Contractor believes additional compensation may be due and nature of any and all costs involved within 20 working days of the date of service of the written notice of potential claim for changed conditions. Verbal notifications are disallowed.

The potential claim shall include the following certification relative to the California False Claims Act, Government Code Sections 12650-12655.

"The undersigned certifies that the above statements are made in full cognizance of the California



False Claims Act, Government Code Sections 12650-12655. The undersigned further understands and agrees that this potential claim, unless resolved, must be restated as a claim in response to the City's proposed final estimate in order for it to be further considered."

By: _____ Title: _____

Date: _____

Company Name: _____

The Contractor's estimate of costs may be updated when actual costs are known. The Contractor shall submit substantiation of its actual costs to the Engineer within 20 working days after the affected work is completed. Failure to do so shall be sufficient cause for denial of any claim subsequently filed on the basis of said notice of potential claim.

It is the intention of this section that differences between the parties arising under and by virtue of the contract be brought to the attention of the Engineer at the earliest possible time in order that such matters be settled, if possible, or other appropriate action promptly taken.

3-5 DISPUTED WORK. The Contractor shall give the agency written notice of potential claim prior to commencing any disputed work. Failure to give said notice shall constitute a waiver of all claims in connection therewith. If the contractor and the agency are unable to reach agreement on disputed work, the Agency may direct the contractor to proceed with the work.

Prior to proceeding with dispute resolution pursuant to Public Contract Code provisions specified hereinafter, the contractor shall attempt to resolve all disputes informally through the following dispute resolution chain of command:

1. Project Inspector
2. Construction Manager
3. Deputy City Engineer, Construction Management & Inspection
4. City Engineer
5. City Manager

The Contractor shall submit a complete report within 20 working days after completion of the disputed work stating its position on the claim, the contractual basis for the claim, along with all documentation supporting the costs and all other evidentiary materials. At each level of claim or appeal of claim the City will, within 10 working days of receipt of said claim or appeal of claim, review the Contractor's report and respond with a position, request additional information or request that the Contractor meet and present its report. When additional information or a meeting is requested the City will provide its position within 10 working days of receipt of said additional information or Contractor's presentation of its report. The Contractor may appeal each level's position up to the City Manager after which the Contractor may proceed under the provisions of the Public Contract Code.



The authority within the dispute resolution chain of command is limited to recommending a resolution to a claim to the City Manager. Actual approval of the claim is subject to the change order provisions in the contract.

All claims by the Contractor shall be resolved in accordance with Public Contract Code section 9204, which is set forth below:

9204. (a) The Legislature finds and declares that it is in the best interests of the state and its citizens to ensure that all construction business performed on a public works project in the state that is complete and not in dispute is paid in full and in a timely manner.

(b) Notwithstanding any other law, including, but not limited to, Article 7.1 (commencing with Section 10240) of Chapter 1 of Part 2, Chapter 10 (commencing with Section 19100) of Part 2, and Article 1.5 (commencing with Section 20104) of Chapter 1 of Part 3, this section shall apply to any claim by a contractor in connection with a public works project.

(c) For purposes of this section:

(1) "Claim" means a separate demand by a contractor sent by registered mail or certified mail with return receipt requested, for one or more of the following:

(A) A time extension, including, without limitation, for relief from damages or penalties for delay assessed by a public entity under a contract for a public works project.

(B) Payment by the public entity of money or damages arising from work done by, or on behalf of, the contractor pursuant to the contract for a public works project and payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled.

(C) Payment of an amount that is disputed by the public entity.

(2) "Contractor" means any type of contractor within the meaning of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code who has entered into a direct contract with a public entity for a public works project.

(3) (A) "Public entity" means, without limitation, except as provided in subparagraph (B), a state agency, department, office, division, bureau, board, or commission, the California State University, the University of California, a city, including a charter city, county, including a charter county, city and county, including a charter city and county, district, special district, public authority, political subdivision, public corporation, or nonprofit transit corporation wholly owned by a public agency and formed to carry out the purposes of the public agency.

(B) "Public entity" shall not include the following:

(i) The Department of Water Resources as to any project under the jurisdiction of that department.

(ii) The Department of Transportation as to any project under the jurisdiction of that department.

(iii) The Department of Parks and Recreation as to any project under the jurisdiction of that department.

(iv) The Department of Corrections and Rehabilitation with respect to any project under its jurisdiction pursuant to Chapter 11 (commencing with Section 7000) of Title 7 of Part 3 of the Penal Code.

(v) The Military Department as to any project under the jurisdiction of that department.

(vi) The Department of General Services as to all other projects.

(vii) The High-Speed Rail Authority.

(4) "Public works project" means the erection, construction, alteration, repair, or improvement of any public structure, building, road, or other public improvement of any kind.



(5) "Subcontractor" means any type of contractor within the meaning of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code who either is in direct contract with a contractor or is a lower tier subcontractor.

(d) (1) (A) Upon receipt of a claim pursuant to this section, the public entity to which the claim applies shall conduct a reasonable review of the claim and, within a period not to exceed 45 days, shall provide the claimant a written statement identifying what portion of the claim is disputed and what portion is undisputed. Upon receipt of a claim, a public entity and a contractor may, by mutual agreement, extend the time period provided in this subdivision.

(B) The claimant shall furnish reasonable documentation to support the claim.

(C) If the public entity needs approval from its governing body to provide the claimant a written statement identifying the disputed portion and the undisputed portion of the claim, and the governing body does not meet within the 45 days or within the mutually agreed to extension of time following receipt of a claim sent by registered mail or certified mail, return receipt requested, the public entity shall have up to three days following the next duly publicly noticed meeting of the governing body after the 45-day period, or extension, expires to provide the claimant a written statement identifying the disputed portion and the undisputed portion.

(D) Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the public entity issues its written statement. If the public entity fails to issue a written statement, paragraph (3) shall apply.

(2) (A) If the claimant disputes the public entity's written response, or if the public entity fails to respond to a claim issued pursuant to this section within the time prescribed, the claimant may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the public entity shall schedule a meet and confer conference within 30 days for settlement of the dispute.

(B) Within 10 business days following the conclusion of the meet and confer conference, if the claim or any portion of the claim remains in dispute, the public entity shall provide the claimant a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the public entity issues its written statement. Any disputed portion of the claim, as identified by the contractor in writing, shall be submitted to nonbinding mediation, with the public entity and the claimant sharing the associated costs equally. The public entity and claimant shall mutually agree to a mediator within 10 business days after the disputed portion of the claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator. If mediation is unsuccessful, the parts of the claim remaining in dispute shall be subject to applicable procedures outside this section.

(C) For purposes of this section, mediation includes any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this section.

(D) Unless otherwise agreed to by the public entity and the contractor in writing, the mediation conducted pursuant to this section shall excuse any further obligation under Section 20104.4 to mediate after litigation has been commenced.

(E) This section does not preclude a public entity from requiring arbitration of disputes under private arbitration or the Public Works Contract Arbitration Program, if mediation under this section does not resolve the parties' dispute.



(3) Failure by the public entity to respond to a claim from a contractor within the time periods described in this subdivision or to otherwise meet the time requirements of this section shall result in the claim being deemed rejected in its entirety. A claim that is denied by reason of the public entity's failure to have responded to a claim, or its failure to otherwise meet the time requirements of this section, shall not constitute an adverse finding with regard to the merits of the claim or the responsibility or qualifications of the claimant.

(4) Amounts not paid in a timely manner as required by this section shall bear interest at 7 percent per annum.

(5) If a subcontractor or a lower tier subcontractor lacks legal standing to assert a claim against a public entity because privity of contract does not exist, the contractor may present to the public entity a claim on behalf of a subcontractor or lower tier subcontractor. A subcontractor may request in writing, either on his or her own behalf or on behalf of a lower tier subcontractor, that the contractor present a claim for work which was performed by the subcontractor or by a lower tier subcontractor on behalf of the subcontractor. The subcontractor requesting that the claim be presented to the public entity shall furnish reasonable documentation to support the claim. Within 45 days of receipt of this written request, the contractor shall notify the subcontractor in writing as to whether the contractor presented the claim to the public entity and, if the original contractor did not present the claim, provide the subcontractor with a statement of the reasons for not having done so.

(e) The text of this section or a summary of it shall be set forth in the plans or specifications for any public works project that may give rise to a claim under this section.

(f) A waiver of the rights granted by this section is void and contrary to public policy, provided, however, that (1) upon receipt of a claim, the parties may mutually agree to waive, in writing, mediation and proceed directly to the commencement of a civil action or binding arbitration, as applicable; and (2) a public entity may prescribe reasonable change order, claim, and dispute resolution procedures and requirements in addition to the provisions of this section, so long as the contractual provisions do not conflict with or otherwise impair the timeframes and procedures set forth in this section.

(g) This section applies to contracts entered into on or after January 1, 2017.

(h) Nothing in this section shall impose liability upon a public entity that makes loans or grants available through a competitive application process, for the failure of an awardee to meet its contractual obligations.

(i) This section shall remain in effect only until January 1, 2020, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2020, deletes or extends that date.

In addition, all claims by Contractor for \$375,000 or less shall be resolved in accordance with the procedures in the Public Contract Code, Division 2, Part 3, Chapter 1, Article 1.5 (commencing with Section 20104) which is set forth below

ARTICLE 1.5 RESOLUTION OF CONSTRUCTION CLAIMS

20104. (a)(1) This article applies to all public works claims of three hundred seventy-five thousand dollars (\$375,000) or less which arise between a contractor and a local agency.

(2) This article shall not apply to any claims resulting from a contract between a contractor and a public agency when the public agency has elected to resolve any disputes pursuant to Article 7.1



(commencing with Section 10240) of Chapter 1 of Part 2.

(b)(1) "Public work" has the same meaning as in Sections 3100 and 3106 of the Civil Code, except that "public work" does not include any work or improvement contracted for by the state or the Regents of the University of California.

(2) "Claim" means a separate demand by the contractor for (A) a time extension, (B) payment of money or damages arising from work done by, or on behalf of, the contractor pursuant to the contract for a public work and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (C) an amount the payment of which is disputed by the local agency.

(c) The provisions of this article or a summary thereof shall be set forth in the plans or specifications for any work which may give rise to a claim under this article.

(d) This article applies only to contracts entered into on or after January 1, 1991.

20104.2. For any claim subject to this article, the following requirements apply:

(a) The claim shall be in writing and include the documents necessary to substantiate the claim. Claims must be filed on or before the date of final payment. Nothing in this subdivision is intended to extend the time limit or supersede notice requirements otherwise provided by contract for the filing of claims.

(b)(1) For claims of less than fifty thousand dollars (\$50,000), the local agency shall respond in writing to any written claim within 45 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the local agency may have against the claimant.

(2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.

(3) The local agency's written response to the claim, as further documented, shall be submitted to the claimant within 15 days after receipt of the further documentation or within a period of time no greater than that taken by the claimant in producing the additional information, whichever is greater.

(c)(1) For claims of over fifty thousand dollars (\$50,000) and less than or equal to three hundred seventy-five thousand dollars (\$375,000), the local agency shall respond in writing to all written claims within 60 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the local agency may have against the claimant.

(2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.

(3) The local agency's written response to the claim, as further documented, shall be submitted to the claimant within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by the claimant in producing the additional information or requested documentation, whichever is greater.

(d) If the claimant disputes the local agency's written response, or the local agency fails to respond within the time prescribed, the claimant may so notify the local agency, in writing, either within 15 days of receipt of the local agency's response or within 15 days of the local agency's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the local agency shall schedule a meet and confer conference within 30 days for settlement of the dispute.

(e) Following the meet and confer conference, if the claim or any portion remains in dispute, the claimant may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time the claimant submits his or her written claim pursuant to subdivision (a) until the time that claim is denied as a result of the meet and confer process, including any



period of time utilized by the meet and confer process.

(f) This article does not apply to tort claims and nothing in this article is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code.

20104.4. The following procedures are established for all civil actions filed to resolve claims subject to this article:

(a) Within 60 days, but no earlier than 30 days, following the filing or responsive pleadings, the court shall submit the matter to non-binding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide for the selection within 15 days by both parties of a disinterested third person as mediator, shall be commenced within 30 days of the submittal, and shall be concluded within 15 days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court or by stipulation of both parties. If the parties fail to select a mediator within the 15-day period, any party may petition the court to appoint the mediator.

(b)(1) If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1141.11 of that code. The Civil Discovery Act of 1986 (Article 3 (commencing with Section 2016) of Chapter 3 of Title 3 of Part 4 of the Code of Civil procedure) shall apply to any proceeding brought under the subdivision consistent with the rules pertaining to judicial arbitration.

(2) Notwithstanding any other provision of law, upon stipulation of the parties, arbitrators appointed for purposes of this article shall be experienced in construction law, and, upon stipulation of the parties, mediators and arbitrators shall be paid necessary and reasonable hourly rates of pay not to exceed their customary rate, and such fees and expenses shall be paid equally by the parties, except in the case of arbitration where the arbitrator, for good cause, determines a different division. In no event shall these fees or expenses be paid by state or county funds.

(3) In addition to Chapter 2.5 (commencing with Section 1141.10) Title 3 of Part 3 of the Code of Civil Procedure, any party who after receiving an arbitration award requests a trial de novo but does not obtain a more favorable judgment shall, in addition to payment of costs and fees under that chapter, pay the attorney's fees of the other party arising out of the trial de novo.

(c) The court may, upon request by any party, order any witnesses to participate in the mediation or arbitration process.

20104.6. (a) No local agency shall fail to pay money as to any portion of a claim which is undisputed except as otherwise provided in the contract.

(b) In any suit filed under Section 20104.4, the local agency shall pay interest at the legal rate on any arbitration award or judgment. The interest shall begin to accrue on the date the suit is filed in a court of law.

Although not to be construed as proceeding under extra work provisions, the Contractor shall keep and furnish records of disputed work in accordance with Section 3-3.



SECTION 4 – CONTROL OF MATERIALS

4-1 MATERIALS AND WORKMANSHIP.

4-1.1. General. All materials, parts, and equipment furnished by the Contractor in the Work shall be new, high grade, and free from defects. Quality of work shall be in accordance with the generally accepted standards. Material and work quality shall be subject to the Engineer's approval.

Materials and work quality not conforming to the requirements of the Specifications shall be considered defective and will be subject to rejection. Defective work or material, whether in place or not, shall be removed immediately from the site by the Contractor, at its expense, when so directed by the Engineer.

If the Contractor fails to replace any defective or damaged work or material after reasonable notice, the Engineer may cause such work or materials to be replaced. The replacement expense will be deducted from the amount to be paid to the Contractor.

Used or secondhand materials, parts, and equipment may be used only if permitted by the Specifications.

4-1.2 Protection of Work and Materials. The Contractor shall provide and maintain storage facilities and employ such measures as will preserve the specified quality and fitness of materials to be used in the Work. Stored materials shall be reasonably accessible for inspection. The Contractor shall also adequately protect new and existing work and all items of equipment for the duration of the Contract.

The Contractor shall not, without the Agency's consent, assign, sell, mortgage, hypothecate, or remove equipment or materials which have been installed or delivered and which may be necessary for the completion of the Contract.

4-1.3 Inspection Requirements.

4-1.3.1 General. Unless otherwise specified, inspection is required at the source for such typical materials and fabricated items as bituminous paving mixtures, structural concrete, metal fabrication, metal casting, welding, concrete pipe manufacture, protective coating application, and similar shop or plant operations.

Steel pipe in sizes less than 18 inches and vitrified clay and cast iron pipe in all sizes are acceptable upon certification as to compliance with the Specifications, subject to sampling and testing by the Agency. Standard items of equipment such as electric motors, conveyors, elevators, plumbing fixtures, etc., are subject to inspection at the job site only. Special items of equipment such as designed electrical panel boards, large pumps, sewage plant equipment, etc., are subject to inspection at the source, normally only for performance testing. The Specifications may require inspection at the source for other items not typical of those listed in this section.

The Contractor shall provide the Engineer free and safe access to any and all parts of work at any time. Such free and safe access shall include means of safe access and egress, ventilation, lighting, shoring, dewatering and all elements pertaining to the safety of persons as contained in the State of California, California Code of Regulations, Title 8, Industrial Relations, Chapter 4, Division of Industrial Safety, Subchapter 4, Construction Safety Orders and such other safety



regulations as may apply. Contractor shall furnish Engineer with such information as may be necessary to keep the Engineer fully informed regarding progress and manner of work and character of materials. Inspection or testing of the whole or any portion of the work or materials incorporated in the work shall not relieve Contractor from any obligation to fulfill this Contract.

4-1.3.2 Inspection of Materials Not Locally Produced. When the Contractor intends to purchase materials, fabricated products, or equipment from sources located more than 50 miles outside the geographical limits of the Agency, an inspector or accredited testing laboratory (approved by the Engineer), shall be engaged by the Contractor at its expense, to inspect the materials, equipment or process. This approval shall be obtained before producing any material or equipment. The inspector or representative of the testing laboratory shall judge the materials by the requirements of the Plans and Specifications. The Contractor shall forward reports required by the Engineer. No material or equipment shall be shipped nor shall any processing, fabrication or treatment of such materials be done without proper inspection by the approved agent. Approval by said agent shall not relieve the Contractor of responsibility for complying with the Contract requirements.

4-1.3.3 Inspection by the Agency. The Agency will provide all inspection and testing laboratory services within 50 miles of the geographical limits of the Agency. For private contracts, all costs of inspection at the source, including salaries and mileage costs, shall be paid by the permittee.

4-1.4 Test of Material. Before incorporation in the Work, the Contractor shall submit samples of materials, as the Engineer may require, at no cost to the Agency. The Contractor, at its expense, shall deliver the materials for testing to the place and at the time designated by the Engineer. Unless otherwise provided, all initial testing will be performed under the direction of the Engineer, and at no expense to the Contractor. If the Contractor is to provide and pay for testing, it will be stated in the Specifications. For private contracts, the testing expense shall be borne by the permittee.

The Contractor shall notify the Engineer in writing, at least 15 days in advance, of its intention to use materials for which tests are specified, to allow sufficient time to perform the tests. The notice shall name the proposed supplier and source of material.

If the notice of intent to use is sent before the materials are available for testing or inspection or is sent so far in advance that the materials on hand at the time will not last but will be replaced by a new lot prior to use on the Work, it will be the Contractor's responsibility to renotify the Engineer when samples which are representative may be obtained.

Except as specified in these Provisions, the Agency will bear the cost of testing of locally produced materials and/or on-site workmanship where the results of such tests meet or exceed the requirements indicated in the Standard Specifications, Technical Specification, and any Supplemental Provisions. The cost of all other tests shall be borne by the Contractor.

At the option of the Engineer, the source of supply of each of the materials shall be approved by the Engineer before the delivery is started. All materials proposed for use may be inspected or tested at any time during their preparation and use. If, after incorporating such materials into the Work, it is found that sources of supply that have been approved do not furnish a uniform product, or if the product from any source proves unacceptable at any time, the Contractor shall furnish approved material from other approved sources. If any product proves unacceptable after improper storage, handling or for any other reason it shall be rejected, not incorporated into the work and shall be removed from the project site all at the Contractor's expense.



Compaction tests may be made by the Engineer and all costs for tests that meet or exceed the requirements of the specifications shall be borne by the Agency. Said tests may be made at any place along the work as deemed necessary by the Engineer. The costs of any retests made necessary by noncompliance with the specifications shall be borne by the Contractor.

4-1.5 Certification. The Engineer may waive materials testing requirements of the Specifications and accept the manufacturer's written certification that the materials to be supplied meet those requirements. Material test data may be required as part of the certification.

4-1.6 Trade Names or Equals. The Contractor may supply any of the materials specified or offer an equivalent. The Engineer shall determine whether the material offered is equivalent to that specified. Adequate time shall be allowed for the Engineer to make this determination.

Whenever any particular material, process, or equipment is indicated by patent, proprietary or brand name, or by name of manufacturer, such wording is used for the purpose of facilitating its description and shall be deemed to be followed by the words **or equal**. A listing of materials is not intended to be comprehensive, or in order of preference. The Contractor may offer any material, process, or equipment considered to be equivalent to that indicated. The substantiation of offers shall be submitted as provided in the contract documents.

The Contractor shall, at its expense, furnish data concerning items offered by it as equivalent to those specified. The Contractor shall have the material tested as required by the Engineer to determine that the quality, strength, physical, chemical, or other characteristics, including durability, finish, efficiency, dimensions, service, and suitability are such that the item will fulfill its intended function.

Test methods shall be subject to the approval of the Engineer. Test results shall be reported promptly to the Engineer, who will evaluate the results and determine if the substitute item is equivalent. The Engineer's findings shall be final. Installation and use of a substitute item shall not be made until approved by the Engineer.

If a substitute offered by the Contractor is not found to be equal to the specified material, the Contractor shall furnish and install the specified material.

The specified Contract completion time shall not be affected by any circumstance developing from the provisions of this section.

The Contractor is responsible for the satisfactory performance of substituted items. If, in the sole opinion of the Engineer, the substitution is determined to be unsatisfactory in performance, appearance, durability, compatibility with associated items, availability of repair parts and suitability of application the Contractor shall remove the substituted item and replace it with the originally specified item at no cost to the Agency.

4-1.7 Weighing and Metering Equipment. All scales and metering equipment used for proportioning materials shall be inspected for accuracy and certified within the past 12 months by the State of California Bureau of Weights and Measures, by the County Director or Sealer of Weights and Measures, or by a scale mechanic registered with or licensed by the County.



The accuracy of the work of a scale service agency, except as stated herein, shall meet the standards of the California Business and Professions Code and the California Code of Regulations pertaining to weighing devices. A certificate of compliance shall be presented, prior to operation, to the Engineer for approval and shall be renewed whenever required by the Engineer at no cost to the Agency.

All scales shall be arranged so they may be read easily from the operator's platform or area. They shall indicate the true net weight without the application of any factor. The figures of the scales shall be clearly legible. Scales shall be accurate to within 1 percent when tested with the plant shut down. Weighing equipment shall be so insulated against vibration or moving of other operating equipment in the plant area that the error in weighing with the entire plant running will not exceed 2 percent for any setting nor 1.5 percent for any batch.

4-1.8 Calibration of Testing Equipment. Testing equipment, such as, but not limited to pressure gages, metering devices, hydraulic systems, force (load) measuring instruments, and strain-measuring devices shall be calibrated by a testing agency acceptable to the Engineer at intervals not to exceed 12 months and following repairs, modification, or relocation of the equipment. Calibration certificates shall be provided when requested by the Engineer.

4-1.9 Construction Materials Dispute Resolution (Soils, Rock Materials, Concrete, Mortar and Related Materials, Masonry Materials, Bituminous Materials, Rock Products, and Modified Asphalts). In the interest of safety and public value, whenever credible evidence arises to contradict the test values of materials, the Agency and the Contractor will initiate an immediate and cooperative investigation. Test values of materials are results of the materials' tests, as defined by these Specifications or by the special provisions, required to accept the Work. Credible evidence is process observations or test values gathered using industry accepted practices. A contradiction exists whenever test values or process observations of the same or similar materials are diverse enough such that the work acceptance or performance becomes suspect. The investigation shall allow access to all test results, procedures, and facilities relevant to the disputed work and consider all available information and, when necessary, gather new and additional information in an attempt to determine the validity, the cause, and if necessary, the remedy to the contradiction. If the cooperative investigation reaches any resolution mechanism acceptable to both the Agency and the Contractor, the contradiction shall be considered resolved and the cooperative investigation concluded. Whenever the cooperative investigation is unable to reach resolution, the investigation may then either conclude without resolution or continue by written notification of one party to the other requesting the implementation of a resolution process by committee. The continuance of the investigation shall be contingent upon recipient's agreement and acknowledged in writing within 3 calendar days after receiving a request. Without acknowledgement, the investigation shall conclude without resolution. The committee shall consist of three State of California Registered Civil Engineers. Within 7 calendar days after the written request notification, the Agency and the Contractor will each select one engineer. Within 14 calendar days of the written request notification, the two selected engineers will select a third engineer. The goal in selection of the third member is to complement the professional experience of the first two engineers. Should the two engineers fail to select the third engineer, the Agency and the Contractor shall each propose 2 engineers to be the third member within 21 calendar days after the written request notification. The first two engineers previously selected shall then select one of the four proposed engineers in a blind draw. The committee shall be a continuance of the cooperative investigation and will re-consider all available information and if necessary gather new and additional information to determine the validity, the cause, and if necessary, the remedy to the contradiction. The committee will focus upon the performance adequacy of the material(s) using standard engineering principles and practices and to ensure public value, the committee may



provide engineering recommendations as necessary. Unless otherwise agreed, the committee will have 30 calendar days from its formation to complete their review and submit their findings. The final resolution of the committee shall be by majority opinion, in writing, stamped and signed. Should the final resolution not be unanimous, the dissenter may attach a written, stamped, and signed minority opinion. Once started, the resolution process by committee shall continue to full conclusion unless:

1. Within 7 days of the formation of the committee, the Agency and the Contractor reach an acceptable resolution mechanism; or
2. Within 14 days of the formation of the committee, the initiating party withdraws its written notification and agrees to bear all investigative related costs thus far incurred; or
3. At any point by the mutual agreement of the Agency and the Contractor. Unless otherwise agreed, the Contractor shall bear and maintain a record for all the investigative costs until resolution. Should the investigation discover assignable causes for the contradiction, the assignable party, the Agency or the Contractor, shall bear all costs associated with the investigation. Should assignable causes for the contradiction extended to both parties, the investigation will assign costs cooperatively with each party or when necessary, equally. Should the investigation substantiate a contradiction without assignable cause, the investigation will assign costs cooperatively with each party or when necessary, equally. Should the investigation be unable to substantiate a contradiction, the initiator of the investigation shall bear all investigative costs. All claim notification requirements of the contract pertaining to the contradiction shall be suspended until the investigation is concluded.

4-2 MATERIALS TRANSPORTATION, HANDLING AND STORAGE. The Contractor shall order, purchase, transport, coordinate delivery, accept delivery, confirm the quantity and quality received, prepare storage area(s), store, handle, protect, move, relocate, remove and dispose excess of all materials used to accomplish the Work. Materials shall be delivered to the site of the work only during working hours, as defined in Section 6-7.2, and shall be accompanied by bills of lading that shall clearly state for each delivery: the name of the Contractor as consignee, the project name and number, address of delivery and name of consignor and a description of the material(s) shipped. Prior to storage of any materials which have been shipped to or by the Contractor to any location within the Agency's boundaries the Contractor shall provide the Engineer a copy of lease agreements for each property where such materials are stored. The lease agreement shall clearly state the term of the lease, the description of materials allowed to be stored and shall provide for the removal of the materials and restoration of the storage site within the time allowed for the Work. All such storage shall conform to all laws and ordinances that may pertain to the materials stored and to preparation of the storage site and the location of the site on which the materials are stored. Loss, damage or deterioration of all stored materials shall be the Contractor's responsibility. Conformance to the requirements of this section, both within and outside the limits of work are a part of the Work. The Engineer shall have the right to verify the suitability of materials and their proper storage at any time during the Work.



SECTION 5 – UTILITIES

5-1 LOCATION. The Agency and affected utility companies have, by a search of known records, endeavored to locate and indicate on the Plans, all utilities which exist within the limits of the work. However, the accuracy and/or completeness of the nature, size and/or location of utilities indicated on the Plans is not guaranteed.

Where underground main distribution conduits such as water, gas, sewer, electric power, telephone, or cable television are shown on the Plans, the Contractor shall assume that every property parcel will be served by a service connection for each type of utility.

As provided in Section 4216 of the California Government Code, at least 2 working days prior to commencing any excavation, the Contractor shall contact the regional notification center (Underground Service Alert of Southern California) and obtain an inquiry identification number.

The California Department of Transportation is not required by Section 4216 to become a member of the regional notification center. The Contractor shall contact it for location of its subsurface installations.

The Contractor shall determine the location and depth of all utilities, including service connections, which have been marked by the respective owners and which may affect or be affected by its operations. If no pay item is provided in the Contract for this work, full compensation for such work shall be considered as included in the prices bid for other items of work.

5-2 PROTECTION. The Contractor shall not interrupt the service function or disturb the support of any utility without authority from the owner or order from the Agency. All valves, switches, vaults, and meters shall be maintained readily accessible for emergency shutoff.

Where protection is required to ensure support of utilities located as shown on the Plans or in accordance with Section 5-1, the Contractor shall, unless otherwise provided, furnish and place the necessary protection at its expense.

Upon learning of the existence and location of any utility omitted from or shown incorrectly on the Plans, the Contractor shall immediately notify the Engineer in writing. When authorized by the Engineer, support or protection of the utility will be paid for as provided in Section 3-2.2.3 or 3-3.

The Contractor shall immediately notify the Engineer and the utility owner if any utility is disturbed or damaged. The Contractor shall bear the costs of repair or replacement of any utility damaged if located as noted in Section 5-1.

When placing concrete around or contiguous to any non-metallic utility installation, the Contractor shall at its expense:

1. Furnish and install a 2 inch cushion of expansion joint material or other similar resilient material; or
2. Provide a sleeve or other opening which will result in a 2 inch minimum-clear annular space between the concrete and the utility; or
3. Provide other acceptable means to prevent embedment in or bonding to the concrete.



Where concrete is used for backfill or for structures which would result in embedment, or partial embedment, of a metallic utility installation; or where the coating, bedding or other cathodic protection system is exposed or damaged by the Contractor's operations, the Contractor shall notify the Engineer and arrange to secure the advice of the affected utility owner regarding the procedures required to maintain or restore the integrity of the system.

5-3 REMOVAL. Unless otherwise specified, the Contractor shall remove all interfering portions of utilities shown on the Plans or indicated in the Bid documents as "abandoned" or "to be abandoned in place". Before starting removal operations, the Contractor shall ascertain from the Agency whether the abandonment is complete, and the costs involved in the removal and disposal shall be included in the Bid for the items of work necessitating such removals.

5-4 RELOCATION. When feasible, the owners responsible for utilities within the area affected by the Work will complete their necessary installations, relocations, repairs, or replacements before commencement of work by the Contractor. When the Plans or Specifications indicate that a utility installation is to be relocated, altered, or constructed by others, the Agency will conduct all negotiations with the owners and work will be done at no cost to the Contractor as provided in the Standard Specifications for Public Works Construction, Section 301-1.6, **2018 Edition**, and any supplements thereto. Utilities which are relocated in order to avoid interference shall be protected in their position and the cost of such protection shall be included in the Bid for the items of work necessitating such relocation.

After award of the Contract, portions of utilities which are found to interfere with the Work will be relocated, altered or reconstructed by the owners, or the Engineer may order changes in the Work to avoid interference. Such changes will be paid for in accordance with Section 3-2.

When the Plans or Specifications provide for the Contractor to alter, relocate, or reconstruct a utility, all costs for such work shall be included in the Bid for the items of work necessitating such work. Temporary or permanent relocation or alteration of utilities requested by the Contractor for its convenience shall be its responsibility and it shall make all arrangements and bear all costs.

The utility owner will relocate service connections as necessary within the limits of the Work or within temporary construction or slope easements. When directed by the Engineer, the Contractor shall arrange for the relocation of service connections as necessary between the meter and property line, or between a meter and the limits of temporary construction or slope easements. The relocation of such service connections will be paid for in accordance with provisions of Section 3-3. Payment will include the restoration of all existing improvements which may be affected thereby. The Contractor may agree with the owner of any utility to disconnect and reconnect interfering service connections. The Agency will not be involved in any such agreement.

In conformance with Section 5-6 the Contractor shall coordinate the work with utility agencies and companies. Prior to the installation of any and all utility structures within the limits of work by any utility agency or company, or its contractor, the Contractor shall place all curb or curb and gutter that is a part of the work and adjacent to the location where such utility structures are shown on the plans and are noted as being located, relocated or are otherwise shown as installed by others. In order to minimize delays to the Contractor caused by the failure of other parties to relocate utilities that interfere with the construction, the Contractor, upon the Engineer's approval, may be permitted to temporarily omit the portion of work affected by the utility. If such temporary omission is approved by the Engineer the Contractor shall place survey or other physical control markers sufficient to locate the curb or curb and gutter to the satisfaction of the utility agency or company.



Such temporary omission shall be for the Contractor's convenience and no additional compensation will be allowed therefore or for additional work, materials or delay associated with the temporary omission. The portion thus omitted shall be constructed by the Contractor immediately following the relocation of the utility involved unless otherwise directed by the Engineer.

5-5 DELAYS. The Contractor shall notify the Engineer of its construction schedule insofar as it affects the protection, removal, or relocation of utilities. Said notification shall be included as a part of the construction schedule required in Section 6-1. The Contractor shall notify the Engineer in writing of any subsequent changes in the construction schedule which will affect the time available for protection, removal, or relocation of utilities.

The Contractor will not be entitled to damages or additional payment for delays attributable to utility relocations or alterations if correctly located, noted, and completed in accordance with Section 5-1.

The Contractor may be given an extension of time for unforeseen delays attributable to unreasonably protracted interference by utilities in performing work correctly shown on the Plans.

The Agency will assume responsibility for the timely removal, relocation, or protection of existing main or trunkline utility facilities within the area affected by the Work if such utilities are not identified in the Contract Documents. The Contractor will not be assessed liquidated damages for any delay caused by failure of Agency to provide for the timely removal, relocation, or protection of such existing facilities.

If the Contractor sustains loss due to delays attributable to interferences, relocations, or alterations not covered by Section 5-1, which could not have been avoided by the judicious handling of forces, equipment, or plant, there shall be paid to the Contractor such amount as the Engineer may find to be fair and reasonable compensation for such part of the Contractor's actual loss as was unavoidable and the Contractor may be granted an extension of time.

5-6 COOPERATION. When necessary, the Contractor shall so conduct its operations as to permit access to the Work site and provide time for utility work to be accomplished during the progress of the Work.

SECTION 6 – PROSECUTION, PROGRESS, AND ACCEPTANCE OF THE WORK

6-1 CONSTRUCTION SCHEDULE AND COMMENCEMENT OF WORK. Except as otherwise provided herein and unless otherwise prohibited by permits from other agencies as may be required by law the Contractor shall begin work within fourteen (14) calendar days after receipt of the "Notice to Proceed".

6-1.1 Pre-Construction Meeting. After, or upon, notification of contract award, the Engineer will set the time and location for the Preconstruction Meeting. Attendance of the Contractor's management personnel responsible for the management, administration, and execution of the project is mandatory for the meeting to be convened. Failure of the Contractor to have the Contractor's responsible project personnel attend the Preconstruction Meeting will be grounds for default by Contractor per Section 6-4. No separate payment will be made for the Contractor's attendance at the meeting. The notice to proceed will only be issued on or after the completion of the preconstruction meeting.

6-1.1.1 Baseline Construction Schedule Submittal. The Contractor shall submit the Baseline Construction Schedule per the submittal requirements of Section 2-5.3. The submittal of the Baseline Construction Schedule shall include each item and element of Sections 6-1.2 through 6-1.2.9 and shall be on hard (paper) copy and electronic media conforming to Section 6-1.3.3 Electronic Media.

6-1.2 Preparation and Review of the Baseline Construction Schedule. The Contractor shall prepare the Baseline Construction Schedule as a Critical Path Method (CPM) Schedule in the precedence diagram method (activity-on-node) format. The Baseline Construction Schedule shall depict a workable plan showing the sequence, duration, and interdependence of all activities required to represent the complete performance of all project work as well as periods where work is precluded. The Baseline Construction Schedule shall begin with the projected date of issuance of the notice to proceed and conclude with the date of final completion per the contract duration. The Baseline Construction Schedule shall include detail of all project phasing, staging, and sequencing, including all milestones necessary to define beginning and ending of each phase or stage.

6-1.2.1 Time-Scaled Network Diagram. As a part of the Baseline Construction Schedule the Contractor shall prepare and submit to the Engineer a complete time-scaled network diagram showing all of the activities, logic relationships, and milestones comprising the schedule.

6-1.2.2 Tabular Listing. As a part of the Baseline Construction Schedule the Contractor shall prepare and submit to the Engineer a tabular listing of all of the activities, showing for each activity the identification number, the description, the duration, the early start, the early finish, the late start, the late finish, the total float, and all predecessor and successor activities for the activity described.

6-1.2.3 Bar Chart. As a part of the Baseline Construction Schedule the Contractor shall prepare and submit to the Engineer a chart showing individual tasks and their durations arranged with the tasks on the vertical axis and duration on the horizontal axis. The bar chart shall use differing texture patterns or distinctive line types to show the critical path. A three-week look ahead version of the bar chart schedule showing activities for the upcoming three week period shall be provided to the City on a weekly basis.



6-1.2.4 Schedule Software. The Contractor shall use commercially available software equal to the Windows 2000 compatible "Suretrak" program by Primavera or "Project" program by Microsoft Corporation to prepare the Baseline Construction Schedule and all updates thereto. The Contractor shall submit to the Agency a CD-ROM data disk with all network information contained thereon, in a format readable by a Microsoft Windows 2000 system. The Agency will use a "Suretrak", "Project" or equal software program for review of the Contractor's schedule. Should the Contractor elect to use a scheduling program other than the "Suretrak" program by Primavera or "Project" program by Microsoft Corporation the Contractor shall provide the Engineer three copies of the substituted program that are fully licensed to the Agency and 32 class hours of on-site training by the program publisher for up to eight Agency staff members. The classes shall be presented on Mondays through Thursdays, inclusive, between the hours of 8:00 a.m. and 5:00 p.m. The on-site training shall be held at 1635 Faraday Avenue, Carlsbad, California. The dates and times of the on-site training shall be submitted to the Engineer for approval five working days before the start of the on-site training. The on-site training shall be completed prior to the submittal of the first Baseline Construction Schedule.

6-1.2.5 Schedule Activities. Except for submittal activities, activity durations shall not be shorter than 1 working day nor longer than 15 working days, unless specifically and individually allowed by the Engineer. The Baseline Construction Schedule shall include between 100 and 500 activities, including submittals, interfaces between utility companies and other agencies, project milestones and equipment and material deliveries. The number of activities will be sufficient, in the judgment of the Engineer, to communicate the Contractor's plan for project execution, to accurately describe the project work, and to allow monitoring and evaluation of progress and of time impacts. Each activity's description shall accurately define the work planned for the activity and each activity shall have recognizable beginning and end points.

6-1.2.6 Float. Float or slack time within the schedule is available without charge or compensation to whatever party or contingency first exhausts it.

6-1.2.7 Restraints to Activities. Any submittals, utility interfaces, or any furnishing of Agency supplied materials, equipment, or services, which may impact any activity's construction shall be shown as a restraint to those activities. Time periods to accommodate the review and correction of submittals shall be included in the schedule.

6-1.2.8 Late Completion. A Baseline Construction Schedule showing a project duration longer than the specified contract duration will not be acceptable and will be grounds for determination of default by Contractor, per Section 6-4.

6-1.2.9 Early Completion. The Baseline Construction Schedule will show the Contractor's plan to support and maintain the project for the entire contractual time span of the project. Should the Contractor propose a project duration shorter than contract duration, a complete Baseline Construction Schedule must be submitted, reflecting the shorter duration, in complete accordance with all schedule requirements of Section 6-1. The Engineer may choose to accept the Contractor's proposal of a project duration shorter than the duration specified; provided the Agency is satisfied the shortened Baseline Construction Schedule is reasonable and the Agency and all other entities, public and private, which interface with the project are able to support the provisions of the shortened Baseline Construction Schedule. The Agency's acceptance of a shortened duration project will be confirmed through the execution of a contract change order revising the project duration and implementing all contractual requirements including liquidated damages in accordance with the revised duration.



6-1.2.10 Engineer's Review. The Construction Schedule is subject to the review of the Engineer. The Engineer's determination that the Baseline Construction Schedule proposed by the Contractor complies with the requirements of these supplemental provisions shall be a condition precedent to issuance of the Notice to Proceed by the Engineer. If the Engineer determines that the Construction Schedule does not meet the requirements of these specifications the Contractor shall correct the Construction Schedule to meet these specifications and resubmit it to the Engineer. Failure of the Contractor to obtain the Engineer's determination that the initial Construction Schedule proposed by the Contractor complies with the requirements of these supplemental provisions within thirty (30) working days after the date of the preconstruction meeting shall be grounds for termination of the contract per Section 6-4. Days used by the Engineer to review the initial Construction Schedule will not be included in the 30 working days.

The Engineer will review and return to the Contractor, with any comments, the Baseline Construction Schedule within 15 working days of submittal. The Baseline Construction Schedule will be returned marked as per Sections 6-1.2.10.1 through 6-1.2.10.3.

6-1.2.10.1 "Accepted." The Contractor may proceed with the project work upon issuance of the Notice to Proceed and will receive payment for the schedule in accordance with Section 6-1.8.1.

6-1.2.10.2 "Accepted with Comments." The Contractor may proceed with the project work upon issuance of the Notice to Proceed. The Contractor must resubmit the schedule incorporating the comments prior to receipt of payment per Section 6-1.8.1.

6-1.2.10.3 "Not Accepted." The Contractor must resubmit the schedule incorporating the corrections and changes of the comments prior to receipt of payment per Section 6-1.8.1. The Notice to Proceed will not be issued by the Engineer if the changes of the comments are not submitted as required hereinbefore and marked "Accepted" or "Accepted with Comments" by the Engineer. The Contractor, at the sole option of the Engineer, may be considered as having defaulted the contract under the provisions of Section 6-4 DEFAULT BY CONTRACTOR if the changes of the comments are not submitted as required hereinbefore and marked "Accepted" by the Engineer.

6-1.3 Preparation of Schedule Updates and Revisions. The Contractor shall meet with the Engineer during the last week of each month to agree upon each activity's schedule status and shall submit monthly updates of the Baseline Construction Schedule confirming the agreements no later than the fifth working day of the following month. The monthly update will be submitted on hard (paper) copy and electronic media conforming to Section 6-1.3.3 Electronic Media per the submittal requirements of Section 2-5.3 and will include each item and element of Sections 6-1.2 through 6-1.2.9 and 6-1.3.1 through 6-1.3.7.

6-1.3.1 Actual Activity Dates. The actual dates each activity was started and/or completed during the month. After first reporting an actual date, the Contractor shall not change that actual date in later updates without specific notification to the Engineer with the update.

6-1.3.2 Activity Percent Complete. For each activity underway at the end of the month, the Contractor shall report the percentage determined by the Engineer as complete for the activity.

6-1.3.3 Electronic Media. The schedule data disk shall be a CD-ROM, labeled with the project name and number, the Contractor's name and the date of preparation of the schedule data disk. The schedule data disk shall be readable by the software specified in Section 6-1.2.4 "Schedule



Software” and shall be free of file locking, encryption or any other protocol that would impede full access of all data stored on it.

6-1.3.4 List of Changes. A list of all changes made to the activities or to the interconnecting logic, with an explanation for each change.

6-1.3.5 Change Orders. Each monthly update will include the addition of the network revisions reflecting the change orders approved in the previous month. The network revisions will be as agreed upon during the review and acceptance of the Contractor’s change orders.

6-1.3.6 Bar Chart. Each monthly update will include a chart showing individual tasks and their durations arranged with the tasks on the vertical axis and duration on the horizontal axis. The bar chart shall use differing texture patterns or distinctive line types to show the critical path.

6-1.4 Engineer’s Review of Updated Construction Schedule. The Engineer will review and return the Updated Construction Schedule to the Contractor, with any comments, within 5 working days of submittal. The Updated Construction Schedule will be returned marked as per Sections 6-1.4.1 through 6-1.4.3. Any Updated Construction Schedule marked “Accepted with Comments” or “Not Accepted” by the Engineer will be returned to the Contractor for correction. Upon resubmittal the Engineer will review and return the resubmitted Updated Construction Schedule to the Contractor, with any comments, within 5 working days. Failure of the Contractor to submit a monthly updated construction schedule will invoke the same consequences as the Engineer returning a monthly updated construction schedule marked “Not Accepted”.

6-1.4.1 “Accepted.” The Contractor may proceed with the project work and will receive payment for the schedule in accordance with Section 6-1.8.2.

6-1.4.2 “Accepted with Comments.” The Contractor may proceed with the project work. The Contractor must resubmit the Updated Construction Schedule to the Engineer incorporating the corrections and changes noted in the Engineer’s comments prior to receipt of payment per Section 6-1.8.2.

6-1.4.3 “Not Accepted.” The Contractor must resubmit the Updated Construction Schedule to the Engineer incorporating the corrections and changes noted in the Engineer’s comments prior to receipt of payment per Section 6-1.8.2. The Contractor, at the sole option of the Engineer, may be considered as having defaulted the contract under the provisions of Section 6-4 DEFAULT BY CONTRACTOR if the changes of the comments are not submitted and marked “Accepted” by the Engineer before the last day of the month in which the Updated Construction Schedule is due. If the Contractor fails to submit the corrected Updated Construction Schedule as required herein the Contractor may elect to proceed with the project at its own risk. Should the Contractor elect not to proceed with the project, any resulting delay, impact, or disruption to the project will be the Contractor’s responsibility.

6-1.5 Late Completion or Milestone Dates. Should the Schedule Update indicate a completion or contractually required milestone date later than the properly adjusted contract or milestone duration, the Agency may withhold Liquidated Damages for the number of days late. Should a subsequent “Accepted” Schedule Update remove all or a portion of the delay, all or the allocated portion of the previously held Liquidated Damages shall be released in the monthly payment to the Contractor immediately following the “Accepted” schedule.



6-1.6 Interim Revisions. Should the actual or projected progress of the work become substantially different from that depicted in the Project Schedule, independently of and prior to the next monthly update, the Contractor will submit a revised Baseline Construction Schedule, with a list and explanation of each change made to the schedule. The Revised Construction Schedule will be submitted per the submittal requirements of Section 2-5.3 and per the schedule review and acceptance requirements of Section 6-1, including but not limited to the acceptance and payment provisions. As used in this section “substantially different” means a time variance greater than 5 percent of the number of days of duration for the project.

6-1.7 Final Schedule Update. The Contractor shall prepare and submit a final schedule update when one hundred percent of the construction work is completed. The Contractor’s Final Schedule Update must accurately represent the actual dates for all activities. The final schedule update shall be prepared and reviewed per Sections 6-1.3 Preparation of Schedule Updates and Revisions and 6-1. 4 Engineer’s Review of Updated Construction Schedule. Acceptance of the final schedule update is required for completion of the project and release of any and all funds retained per Section 9-3.2.

6-1.8 Measurement and Payment of Construction Schedule. The Contractor’s preparation, revision and maintenance of the Construction Schedule are incidental to the work and no separate payment will be made therefore.

6-2 PROSECUTION OF WORK. To minimize public inconvenience and possible hazard and to restore street and other work areas to their original condition and state of usefulness as soon as practicable, the Contractor shall diligently prosecute the Work to completion. If the Engineer determines that the Contractor is failing to prosecute the Work to the proper extent, the Contractor shall, upon orders from the Engineer, immediately take steps to remedy the situation. All costs of prosecuting the Work as described herein shall be included in the Contractor’s Bid. Should the Contractor fail to take the necessary steps to fully accomplish said purposes, after orders of the Engineer, the Engineer may suspend the work in whole or part, until the Contractor takes said steps.

As soon as possible under the provisions of the Specifications, the Contractor shall backfill all excavations and restore to usefulness all improvements existing prior to the start of the Work.

If Work is suspended through no fault of the Agency, all expenses and losses incurred by the Contractor during such suspensions shall be borne by the Contractor. If the Contractor fails to properly provide for public safety, traffic, and protection of the Work during periods of suspension, the Agency may elect to do so, and deduct the cost thereof from monies due the Contractor. Such actions will not relieve the Contractor from liability.

6-2.1 Order of Work. The work to be done shall consist of furnishing all labor, equipment and materials, and performing all operations necessary to complete the Project Work as shown on the Project Plans and as specified in the Specifications. The work includes all labor, materials, equipment and other associated items to complete landscape irrigation; planting of trees, shrubs and groundcovers; erosion and water runoff protection (during construction operations); mulching; installation of lighting, shade structures, fitness equipment, picnic tables, benches, and other park amenities as specified on plans and in accordance with contract documents. Work under this contract shall also include installation of two entry monuments.



6-2.3 Project Meetings. The Engineer will establish the time and location of weekly Project Meetings. The Contractor's Representative shall attend each Project Meeting. The Project Representative shall be the individual determined under Section 7-6, "The Contractor's Representative". No separate payment for attendance of the Contractor, the Contractor's Representative or any other employee or subcontractor or subcontractor's employee at these meetings will be made.

6-3 SUSPENSION OF WORK.

6-3.1 General. The Work may be suspended in whole or in part when determined by the Engineer that the suspension is necessary in the interest of the Agency. The Contractor shall comply immediately with any written order of the Engineer. Such suspension shall be without liability to the Contractor on the part of the Agency except as otherwise specified in Section 6-6.3.

6-3.2 Archaeological and Paleontological Discoveries. If discovery is made of items of archaeological or paleontological interest, the Contractor shall immediately cease excavation in the area of discovery and shall not continue until ordered by the Engineer. When resumed, excavation operations within the area of discovery shall be as directed by the Engineer.

Discoveries which may be encountered may include, but not be limited to, dwelling sites, stone implements or other artifacts, animal bones, human bones, and fossils.

The Contractor shall be entitled to an extension of time and compensation in accordance with the provisions of Section 6-6.

6-4 DEFAULT BY CONTRACTOR. If the Contractor fails to begin delivery of material and equipment, to commence the Work within the time specified, to maintain the rate of delivery of material, to execute the Work in the manner and at such locations as specified, or fails to maintain the Work schedule which will insure the Agency's interest, or, if the Contractor is not carrying out the intent of the Contract, the Agency may serve written notice upon the Contractor and the Surety on its Faithful Performance Bond demanding satisfactory compliance with the Contract.

The Contract may be canceled by the Board without liability for damage, when in the Board's opinion the Contractor is not complying in good faith, has become insolvent, or has assigned or subcontracted any part of the Work without the Board's consent. In the event of such cancellation, the Contractor will be paid the actual amount due based on Contract Unit Prices or lump sums bid and the quantity of the Work completed at the time of cancellation, less damages caused to the Agency by acts of the Contractor. The Contractor, in having tendered a Bid, shall be deemed to have waived any and all claims for damages because of cancellation of Contract for any such reason. If the Agency declares the Contract canceled for any of the above reasons, written notice to that effect shall be served upon the Surety. The Surety shall, within five (5) days, assume control and perform the Work as successor to the Contractor.

If the Surety assumes any part of the Work, it shall take the Contractor's place in all respects for that part and shall be paid by the Agency for all work performed by it in accordance with the Contract. If the Surety assumes the entire Contract, all money due the Contractor at the time of its default shall be payable to the Surety as the Work progresses, subject to the terms of the Contract.

If the Surety does not assume control and perform the Work within 5 days after receiving notice of cancellation, or fails to continue to comply, the Agency may exclude the Surety from the premises. The Agency may then take possession of all material and equipment and complete the Work



by Agency forces, by letting the unfinished Work to another Contractor, or by a combination of such methods. In any event, the cost of completing the Work shall be charged against the Contractor and its Surety and may be deducted from any money due or becoming due from the Agency. If the sums due under the Contract are insufficient for completion, the Contractor or Surety shall pay to the Agency within 5 days after the completion, all costs in excess of the sums due.

The provisions of this section shall be in addition to all other rights and remedies available to the Agency under law.

6-5 TERMINATION OF CONTRACT. The Board may terminate the Contract at its own discretion or when conditions encountered during the Work make it impossible or impracticable to proceed, or when the Agency is prevented from proceeding with the Contract by act of God, by law, or by official action of a public authority.

6-6 DELAYS AND EXTENSIONS OF TIME.

6-6.1 General. If delays are caused by unforeseen events beyond the control of the Contractor, such delays will entitle the Contractor to an extension of time as provided herein, but the Contractor will not be entitled to damages or additional payment due to such delays, except as provided in 6-6.3. Such unforeseen events may include: war, government regulations, labor disputes, strikes, fires, floods, adverse weather or elements necessitating cessation of work, inability to obtain materials, labor or equipment, required extra work, or other specific events as may be further described in the Specifications.

No extension of time will be granted for a delay caused by the Contractor's inability to obtain materials unless the Contractor furnishes to the Engineer documentary proof. the proof must be provided in a timely manner in accordance with the sequence of the Contractor's operations and the approved construction schedule.

If delays beyond the Contractor's control are caused by events other than those mentioned above, the Engineer may deem an extension of time to be in the best interests of the Agency. The Contractor will not be entitled to damages or additional payment due to such delays, except as provided in Section 6-6.3.

If delays beyond the Contractor's control are caused solely by action or inaction by the Agency, such delays will entitle the Contractor to an extension of time as provided in Section 6-6.2.

6-6.2 Extensions of Time. Extensions of time, when granted, will be based upon the effect of delays to the Work. They will not be granted for noncontrolling delays to minor portions of the Work unless it can be shown that such delays did or will delay the progress of the Work.

6-6.3 Payment for Delays to Contractor. The Contractor will be compensated for damages incurred due to delays for which the Agency is responsible. Such actual costs will be determined by the Engineer. The Agency will not be liable for damages which the Contractor could have avoided by any reasonable means, such as judicious handling of forces, equipment, or plant. The determination of what damages the Contractor could have avoided will be made by the Engineer.

6-6.4 Written Notice and Report. The Contractor shall provide written notice to the Engineer within two hours of the beginning of any period that the Contractor has placed any workers or equipment on standby for any reason that the Contractor has determined to be caused by the



Agency or by any organization that the Agency may otherwise be obligated by. The Contractor shall provide continuing daily written notice to the Engineer, each working day, throughout the duration of such period of delay. The initial and continuing written notices shall include the classification of each workman and supervisor and the make and model of each piece of equipment placed on standby, the cumulative duration of the standby, the Contractor's opinion of the cause of the delay and a cogent explanation of why the Contractor could not avoid the delay by reasonable means. Should the Contractor fail to provide the notice(s) required by this section the Contractor agrees that no delay has occurred and that it will not submit any claim(s) therefore.

6-7 TIME OF COMPLETION.

6-7.1 General. The Contractor shall complete the Work within the time set forth in the Contract. The Contractor shall complete each portion of the Work within such time as set forth in the Contract for such portion. The time of completion of the Contract shall be expressed in **working days**. The Contractor shall diligently prosecute the work to completion within **145** working days after the starting date specified in the Notice to Proceed.

6-7.2 Working Day. A working day is any day within the period between the start of the Contract time as defined in Section 6-1 and the date provided for completion, or upon field acceptance by the Engineer for all work provided for in the Contract, whichever occurs first, other than:

1. Saturday,
2. Sunday,
3. any day designated as a holiday by the Agency,
4. any other day designated as a holiday in a Master Labor Agreement entered into by the Contractor or on behalf of the Contractor as an eligible member of a contractor association,
5. any day the Contractor is prevented from working at the beginning of the workday for cause as defined in Section 6-6.1,
6. any day the Contractor is prevented from working during the first 5 hours with at least 60 percent of the normal work force for cause as defined in Section 6-6.1.

Unless otherwise approved in writing by the Engineer, the hours of work shall be between the hours of **7:00 a.m. and 4:00 p.m.** on Mondays through Fridays, excluding Agency holidays. The Contractor shall obtain the written approval of the Engineer if the Contractor desires to work outside said hours or at any time during weekends and/or holidays. This written permission must be obtained at least 48 hours prior to such work. The Engineer may approve work outside the hours and/or days stated herein when, in his/her sole opinion, such work conducted by the Contractor is beneficial to the best interests of the Agency. The Contractor shall pay the inspection costs of such work.

The Contractor shall incorporate the dates, areas and types of work prohibited in this section in the Construction Schedule required by Section 6.1. No additional payment, adjustment of bid prices or adjustment of contract time of completion will be allowed as a consequence of the prohibition of work being performed within the dates, areas and/or types of work prohibited in this section.

6-7.2.1 Construction-related Noise. Construction noise created during the general breeding season (January 15 to September 15) that could affect the breeding of the coastal California gnatcatcher, migratory songbirds, and other bird species associated with adjacent undeveloped areas shall be avoided. No loud construction noise (exceeding 60dBA hourly average, adjusted



for ambient noise levels, at the nesting site) may take place within 500 feet of active nesting sites during the general breeding season (January 15 through September 15).

If it is confirmed that the project could result in construction-related noise impacts to breeding birds during the general breeding season, the City shall retain a qualified biologist to monitor the construction operations. The biological monitor shall be present to monitor construction activities that occur adjacent to the undeveloped open space potentially supporting breeding birds. The monitor shall verify that construction noise levels do not exceed 60dBA hourly average and shall have the ability to halt construction work, if necessary, and confer with the City, USFWS, and CDFG to ensure the proper implementation of additional protection measures during construction. The biologist shall report any violation to the USFWS and/or CDFG within 24 hours of its occurrence. Contractor is encouraged to complete all grading activities outside of the general breeding season. All costs associated with implementation of noise protection measures shall be the responsibility of the Contractor.

The Contractor shall incorporate the dates, areas and types of work prohibited in this section in the Construction Schedule required by Section 6.1. No additional payment, adjustment of bid prices or adjustment of contract time of completion will be allowed as a consequence of the prohibition of work being performed within the dates, areas and/or types of work prohibited in this section.

6-7.3 Contract Time Accounting. The Engineer will make a daily determination of each working day to be charged against the Contract time. These determinations will be discussed and the Contractor will be furnished a periodic statement showing allowable number of working days of Contract time, as adjusted, at the beginning of the reporting period. The statement will also indicate the number of working days charged during the reporting period and the number of working days of Contract time remaining. If the Contractor does not agree with the statement, it shall file a written protest within 15 days after receipt, setting forth the facts of the protest. Otherwise, the statement will be deemed to have been accepted.

6-8 COMPLETION, ACCEPTANCE, AND WARRANTY. The Work will be inspected by the Engineer for acceptance upon receipt of the Contractor's written assertion that the Work has been completed.

The Engineer will not accept the Work or any portion of the Work before all of the Work is completed and all outstanding deficiencies that may exist are corrected by the Contractor and the Engineer is satisfied that all the materials and workmanship, and all other features of the Work, meet the requirements of all of the specifications for the Work. Use, temporary, interim or permanent, of all, or portions of, the Work does not constitute acceptance of the Work. If, in the Engineer's judgment, the Work has been completed and is ready for acceptance the Engineer will so certify to the Board. Upon such certification by the Engineer the Board may accept the completed Work. Upon the Board's acceptance of the Work the Engineer will cause a "Notice of Completion" to be filed in the office of the San Diego County Recorder. The date of recordation shall be the date of completion of the Work.

All work shall be warranted for one (1) year after recordation of the "Notice of Completion" and any faulty work or materials discovered during the warranty period shall be repaired or replaced by the Contractor, at its expense. Twenty-five percent of the faithful performance bond shall be retained as a warranty bond for the one-year warranty period. The Contractor shall replace or repair any such defective work in a manner satisfactory to the Engineer, after notice to do so from the Engineer, and within the time specified in the notice. If the Contractor fails to make such



replacement or repairs within the time specified in the notice, the Agency may perform this work and the Contractor's sureties shall be liable for the cost thereof.

6-9 LIQUIDATED DAMAGES. Failure of the Contractor to complete the Work within the time allowed will result in damages being sustained by the Agency. For each consecutive calendar day in excess of the time specified for completion of Work, as adjusted in accordance with Section 6-6, the Contractor shall pay the Agency, or have withheld monies due it, the sum of **two thousand dollars (\$2,000) per day**. Such sum is liquidated damages and shall not be construed as a penalty and may be deducted from payments due the Contractor if such delay occurs.

Execution of the Contract shall constitute agreement by the Agency and Contractor that **\$2,000** per day is the minimum value of costs and actual damages caused by the Contractor to complete the Work within the allotted time. Any progress payments made after the specified completion date shall not constitute a waiver of this paragraph or of any damages.

6-10 USE OF IMPROVEMENT DURING CONSTRUCTION. The Agency reserves the right to take over and utilize all or part of any completed facility or appurtenance. The Contractor will be notified in writing in advance of such action. Such action by the Agency will relieve the Contractor of responsibility for injury or damage to said completed portions of the improvement resulting from use by public traffic or from the action of the elements or from any other cause, except Contractor operations or negligence. The Contractor will not be required to reclean such portions of the improvement before field acceptance, except for cleanup made necessary by its operations. Nothing in this section shall be construed as relieving the Contractor from full responsibility for correcting defective work or materials.

In the event the Agency exercises its right to place into service and utilize all or part of any completed facility or appurtenance, the Agency will assume the responsibility and liability for injury to persons or property resulting from the utilization of the facility or appurtenance so placed into service, except for any such injury to persons or property caused by any willful or negligent act or omission by the Contractor, Subcontractor, their officers, employees, or agents.



SECTION 7 – RESPONSIBILITIES OF THE CONTRACTOR

7-1 CONTRACTOR'S EQUIPMENT AND FACILITIES. The Contractor shall furnish and maintain in good condition all equipment and facilities as required for the proper execution and inspection of the Work. Such equipment and facilities shall meet all requirements of applicable ordinances and laws.

7-2 LABOR.

7-2.1 General. Only competent workers shall be employed on the Work. Any person employed who is found to be incompetent, intemperate, troublesome, disorderly, or otherwise objectionable, or who fails or refuses to perform work properly and acceptably, shall be immediately removed from the Work by the Contractor and not be reemployed on the Work.

7-2.2 Laws. The Contractor, its agents, and employees shall be bound by and comply with applicable provisions of the Labor Code and Federal, State, and local laws related to labor.

The Contractor shall strictly adhere to the provisions of the Labor Code regarding minimum wages; the 8-hour day and 40-hour week; overtime; Saturday, Sunday, and holiday work; and nondiscrimination because of race, color, national origin, sex, or religion. The Contractor shall forfeit to the Agency the penalties prescribed in the Labor Code for violations.

In accordance with the Labor Code, the Board has on file and will publish a schedule of prevailing wage rates for the types of work to be done under the Contract. The Contractor shall not pay less than these rates.

Each worker shall be paid subsistence and travel as required by the collective bargaining agreement on file with the State of California Department of Industrial Relations.

The Contractor's attention is directed to Section 1776 of the Labor Code which imposes responsibility upon the Contractor for the maintenance, certification, and availability for inspection of such records for all persons employed by the Contractor or Subcontractor in connection with the project. The Contractor shall agree through the Contract to comply with this Section and the remaining provisions of the Labor Code.

7-3 LIABILITY INSURANCE. Insurance shall be required as specified in section 10 of the Public Works Contract.

The cost of this insurance shall be included in the Contractor's Bid.

7-4 WORKERS' COMPENSATION INSURANCE. Before execution of the Contract by the Board, the Contractor shall file with the Engineer the following signed certification:

"I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract."



The Contractor shall also comply with Section 3800 of the Labor Code by securing, paying for, and maintaining in full force and effect for the duration of the contract, complete Workers' Compensation Insurance, and shall furnish a Certificate of Insurance to the Engineer before execution of the Contract. The Agency, its officers, or employees, will not be responsible for any claims in law or equity occasioned by failure of the Contractor to comply with this paragraph.

All compensation insurance policies shall bear an endorsement or shall have attached a rider whereby it is provided that, in the event of expiration or proposed cancellation of such policies for any reason whatsoever, the Agency shall be notified by registered mail not less than 30 days before expiration or cancellation is effective.

All insurance is to be placed with insurers that are admitted and authorized to conduct business in the state of California and are listed in the official publication of the Department of Insurance of the State of California. Policies issued by the State Compensation Fund meet the requirement for workers' compensation insurance.

7-5 PERMITS. Except as specified herein the Contractor will obtain, at no cost to the Contractor all City of Carlsbad encroachment, right-of-way, grading and building permits necessary to perform work for this contract on Agency property, streets, or other rights-of-way. Contractor shall not begin work until all permits incidental to the work are obtained. The Contractor shall obtain and pay for all permits for the disposal of all materials removed from the project. The cost of said permit(s) shall be included in the price bid for the appropriate bid item and no additional compensation will be allowed therefore. The Contractor shall obtain and pay for all costs incurred for permits necessitated by its operations such as, but not limited to, those permits required for night work, overload, blasting, and demolition. For private contracts, the Contractor shall obtain all permits incidental to the Work or made necessary by its operations, and pay all costs incurred by the permit requirements.

The Contractor shall pay all business taxes or license fees that are required for the work.

7-6 THE CONTRACTOR'S REPRESENTATIVE. Before starting work, the Contractor shall designate in writing a representative who shall have complete authority to act for it. An alternative representative may be designated as well. The representative or alternate shall be present at the Work site whenever work is in progress or whenever actions of the elements necessitate its presence to take measures necessary to protect the Work, persons, or property. Any order or communication given to this representative shall be deemed delivered to the Contractor. A joint venture shall designate only one representative and alternate. In the absence of the Contractor or its representative, instructions or directions may be given by the Engineer to the superintendent or person in charge of the specific work to which the order applies. Such order shall be complied with promptly and referred to the Contractor or its representative.

In order to communicate with the Agency, the Contractor's representative, superintendent, or person in charge of specific work shall be able to speak, read, and write the English language. Additionally, the Contractor shall use proprietary construction management software (Virtual Project Manager, Submittal Exchange, ProCore, etc.) at the direction of the Agency for project communications and document management including, but not limited to, submittals, daily logs, requests for information (RFI), certified payroll records, and change order requests (COR).

7-7 COOPERATION AND COLLATERAL WORK. The Contractor shall be responsible for ascertaining the nature and extent of any simultaneous, collateral, and essential work by others.



The Agency, its workers and contractors and others, shall have the right to operate within or adjacent to the Work site during the performance of such work.

The Agency, the Contractor, and each of such workers, contractors and others, shall coordinate their operations and cooperate to minimize interference.

The Contractor shall include in its Bid all costs involved as a result of coordinating its work with others. the Contractor will not be entitled to additional compensation from the Agency for damages resulting from such simultaneous, collateral, and essential work. If necessary to avoid or minimize such damage or delay, the Contractor shall redeploy its work force to other parts of the Work.

Should the Contractor be delayed by the Agency, and such delay could not have been reasonably foreseen or prevented by the Contractor, the Engineer will determine the extent of the delay, the effect on the project, and any extension of time.

7-7.1 Coordination. The Contractor shall coordinate and cooperate with all the utility companies during the relocation or construction of their lines. The Contractor may be granted a time extension if, in the opinion of the Engineer, a delay is caused by the utility company. No additional compensation will be made to the Contractor for any such delay.

7-8 PROJECT SITE MAINTENANCE.

7-8.1 Cleanup and Dust Control. Throughout all phases of construction, including suspension of work, and until the final acceptance, the Contractor shall keep the site clean and free from rubbish and debris. The Contractor shall also abate dust nuisance by cleaning, sweeping and sprinkling with water, or other means as necessary. The use of water resulting in mud on public streets will not be permitted as a substitute for sweeping or other methods.

When required by the Plans or Specifications, the Contractor shall furnish and operate a self-loading motor sweeper with spray nozzles at least once each working day for the purpose of keeping paved areas acceptably clean wherever construction, including restoration, is incomplete.

Materials and equipment shall be removed from the site as soon as they are no longer necessary. Before the final inspection, the site shall be cleared of equipment, unused materials, and rubbish so as to present a satisfactory clean and neat appearance. All cleanup costs shall be included in the Contractor's Bid.

Care shall be taken to prevent spillage on haul routes. Any such spillage shall be removed immediately and the area cleaned.

Excess excavation material from catch basins or similar structures shall be removed from the site immediately. Sufficient material may remain for use as backfill if permitted by the Specifications. Forms and form lumber shall be removed from the site as soon as practicable after stripping.

Failure of the Contractor to comply with the Engineer's cleanup orders may result in an order to suspend work until the condition is corrected. No additional compensation will be allowed as a result of such suspension.



Cleanup and dust control required herein shall also be executed on weekends and other non-working days when needed to preserve the health safety or welfare of the public. The Contractor shall conduct effective cleanup and dust control throughout the duration of the Contract. The Engineer may require increased levels of cleanup and dust control that, in his/her sole discretion, are necessary to preserve the health, safety and welfare of the public. Cleanup and dust control shall be considered incidental to the items of work that they are associated with and no additional payment will be made therefore.

7-8.2 Air Pollution Control. The Contractor shall not discharge smoke, dust, or any other air contaminants into the atmosphere in such quantity as will violate the regulations of any legally constituted authority.

7-8.3 Vermin Control. At the time of acceptance, structures entirely constructed under the Contract shall be free of rodents, insects, vermin, and pests. Necessary extermination work shall be arranged and paid for by the Contractor as part of the Work within the Contract time and shall be performed by a licensed exterminator in accordance with requirements of governing authorities. The Contractor shall be liable for injury to persons or property and responsible for the elimination of offensive odors resulting from extermination operations.

7-8.4 Sanitation. The Contractor shall provide and maintain enclosed toilets for the use of employees engaged in the Work. These accommodations shall be maintained in a neat and sanitary condition. They shall also comply with all applicable laws, ordinances, and regulations pertaining to public health and sanitation of dwellings and camps.

Wastewater shall not be interrupted. Should the Contractor disrupt existing sewer facilities, sewage shall be conveyed in closed conduits and disposed of in a sanitary sewer system. Sewage shall not be permitted to flow in trenches or be covered by backfill.

7-8.5 Temporary Light, Power, and Water. The Contractor shall furnish, install, maintain, and remove all temporary light, power, and water at its own expense. These include piping, wiring, lamps, and other equipment necessary for the Work. The Contractor shall not draw water from any fire hydrant (except to extinguish a fire), without obtaining permission from the water agency concerned. The Contractor shall obtain a construction meter for water used for the construction, plant establishment, maintenance, cleanup, testing and all other work requiring water related to this contract. The Contractor shall contact the appropriate water agency for requirements. The Contractor shall pay all costs of temporary light, power and water including hookup, service, meter and any, and all, other charges, deposits and/or fees therefore. Said costs shall be considered incidental to the items of work that they are associated with and no additional payment will be made therefore.

7-8.6 Water Pollution Control. The Contractor shall exercise every reasonable precaution to protect channels, storm drains, and bodies of water from pollution. It shall conduct and schedule operations so as to minimize or avoid muddying and silting of said channels, drains, and waters. Water pollution control work shall consist of constructing those facilities which may be required to provide prevention, control, and abatement of water pollution.

The Contractor shall comply with the California State Water Resources Control Board (SWRCB) Order Number **2009-009-DWQ**, National Pollutant Discharge Elimination System (NPDES) General Permit Number CAS000002, Waste Discharge Requirements (WDR's) for Discharges of Stormwater Runoff associated with Construction Activity (General Permit) and subsequent



adopted modifications and with all requirements of the Storm Water Pollution Prevention and Monitoring Plans for this project in accordance with these regulations.

To obtain coverage under general permit of Order Number 2009-009-DWQ, **the City will file a Notice of Intent (NOI) with the SWRCB.** A copy of this NOI is to be included in the Project SWPPP.

The project requires the preparation of a **Tier 2 SWPPP. The Contractor shall prepare the Project SWPPP.**

A model Storm Water Pollution Prevention Plan (SWPPP) is available in **Appendix "A"** or on line at <https://www.carlsbadca.gov/civicax/filebank/blobdload.aspx?BlobID=22759>, for use in preparing the Project SWPPP for approval by the City. The Contractor shall be responsible for the preparation and implementation of the SWPPP and coordination with the City and the Regional Water Quality Control Board. All costs for preparing and implementing the Storm Water Pollution Prevention and Monitoring Plans and coordination with the City and the Regional Water Quality Control Board shall be included as part of the contract price bid.

The Notice of Intent (NOI) **shall** be filed for the project. The NOI shall be filed by **City of Carlsbad** per requirements of the latest NPDES Construction Permit before a Notice to Proceed is issued. **Contractor shall be responsible to pay the annual permit fee.**

7-8.7 Drainage Control. The Contractor shall maintain drainage within and through the work areas. Earth dams will not be permitted in paved areas. Temporary dams of sandbags, asphaltic concrete, or other acceptable material will be permitted when necessary. Such dams shall be removed from the site as soon as their use is no longer necessary.

7-8.8 Noise Control. All internal combustion engines used in the construction shall be equipped with mufflers in good repair when in use on the project with special attention to the City Noise Control Ordinance, Carlsbad Municipal Code Chapter 8.48.

7-9 PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS. The Contractor shall be responsible for the protection of public and private property adjacent to the Work and shall exercise due caution to avoid damage to such property.

The Contractor shall repair or replace all existing improvements within the right-of-way which are not designated for removal (e.g., curbs, sidewalks, driveways, fences, walls, signs, utility installations, pavement, structures, etc.) which are damaged or removed as a result of its operations. When a portion of a sprinkler system within the right-of-way must be removed, the remaining lines shall be capped. Repairs and replacements shall be at least equal to existing improvements and shall match them in finish and dimension.

Maintenance of street and traffic signal systems that are damaged, temporarily removed or relocated shall be done in conformance with 307-1.5.

Trees, lawns, and shrubbery that are not to be removed shall be protected from damage or injury. If damaged or removed due to Contractor's operations, they shall be restored or replaced in as nearly the original condition and location as is reasonably possible. Lawns shall be reseeded and covered with suitable mulch.



The Contractor shall give reasonable notice to occupants or owners of adjacent property to permit them to salvage or relocate plants, trees, fences, sprinklers, and other improvements, within the right-of-way which are designated for removal and would be destroyed because of the Work.

All costs to the Contractor for protecting, removing, and restoring existing improvements shall be included in the Bid.

7-10 PUBLIC CONVENIENCE AND SAFETY.

7-10.1 Park Access. Calavera Hills Community Park will remain open to the public during construction of this project. All equipment and tools shall not be a nuisance or hazard to the general public and shall be removed at the end of the working day. Equipment left on the property overnight and unattended shall be the sole responsibility of the Contractor. Contractor shall protect the work site from other ongoing park operations and activities and for public protection and safety. Contractor shall keep the work site picked up and free of litter, tools, equipment and all other construction related materials. Contractor will only be allowed to stockpile materials on site in fenced designated areas as directed by the Parks Services Manager. City will not be responsible for materials or equipment contractor stockpiles or leaves at the site unattended.

7-10.1.1 Special Events. No work shall be performed by the contractor after 2:00 p.m. on Friday when TGIF Concerts in the Park are scheduled at Calavera Hills Community Park. TGIF Concerts occur up to four times during the summer months.

7-10.2 Traffic and Access. The Contractor's operations shall cause no unnecessary inconvenience. The access rights of the public shall be considered at all times. Unless otherwise authorized, traffic shall be permitted to pass through the Work, or an approved detour shall be provided.

Safe and adequate pedestrian and vehicular access shall be provided and maintained to: fire hydrants; commercial and industrial establishments; churches, schools and parking lots; service stations and motels; hospitals; police and fire stations; and establishments of similar nature. Access to these facilities shall be continuous and unobstructed unless otherwise approved by the Engineer.

Safe and adequate pedestrian zones and public transportation stops, as well as pedestrian crossings of the Work at intervals not exceeding 90 m (300 feet), shall be maintained unless otherwise approved by the Engineer.

Vehicular access to residential driveways shall be maintained to the property line except when necessary construction precludes such access for reasonable periods of time. If backfill has been completed to the extent that safe access may be provided, and the street is opened to local traffic, the Contractor shall immediately clear the street and driveways and provide and maintain access.

The Contractor shall cooperate with the various parties involved in the delivery of mail and the collection and removal of trash and garbage to maintain existing schedules for these services.

Grading operations, roadway excavation and fill construction shall be conducted by the Contractor in a manner to provide a reasonably satisfactory surface for traffic. When rough grading is completed, the roadbed surface shall be brought to a smooth, even condition satisfactory for traffic.



Unless otherwise authorized, work shall be performed in only one-half the roadway at one time. One half shall be kept open and unobstructed until the opposite side is ready for use. If one-half a street only is being improved, the other half shall be conditioned and maintained as a detour.

The Contractor shall schedule the work so as to prevent damage by all traffic, including but not limited to mail delivery. The Contractor shall not schedule work so as to conflict with trash pickup. The trash hauling schedule can be obtained by calling the City's contracted waste disposal company, Coast Waste Management at 929-9417.

During overlay operations, the Contractors schedule for overlay application shall be designated to provide residents and business owners whose streets are to be overlaid sufficient paved parking within an 800 foot distance from their homes or businesses.

Seventy-two hours prior to the start of any construction in the public right-of-way that affects vehicular traffic and/or parking or pedestrian routes, the Contractor shall give written notification of the impending disruption. For a full street closure, all residences and/or businesses on the affected street or alley shall be notified. For partial street closures, or curb, sidewalk and driveway repairs, the residences and/or businesses directly affected by the work shall be notified.

The notification shall be hand delivered and shall state the date and time the work will begin and its anticipated duration. The notification shall list two telephone numbers that may be called to obtain additional information. One number shall be the Contractor's permanent office or field office and the other number shall be a 24-hour number answered by someone who is knowledgeable about the project. At least one of the phone numbers shall be in the (760) area code. An answering machine shall not be connected to either number. The notification shall also give a brief description of the work and simple instructions to the home or business owner on what they need to do to facilitate the construction. The Contractor shall submit the contents of the notification to the Engineer for approval. Notices shall not be distributed until approved by the Engineer.

For residences, the notification shall be pre-cut in a manner that enables it to be affixed to a doorknob without adhesives. It shall be a minimum size of 3-1/2 inches by 8-1/2 inches and shall be brightly colored with contrasting printing. The material shall be equivalent in strength and durability to 65 lb. card stock. The printing on the notice shall be no smaller than 12 point.

In addition to the notifications, the contractor shall post no parking signs 72 hours in advance of the work being performed. The no parking signs shall state the date and time of parking restriction for a duration not to exceed the time necessary to complete the work at that location. Failure of the contractor to meet the posted date requires re-posting the no parking signs 72 hours in advance of the rescheduled work. If the work is delayed or rescheduled the no parking signs shall be removed and re-posted 72 hours in advance of the rescheduled work.

The preparation, materials, printing and distribution of the notifications shall be included in the contract price bid for traffic control and the Contractor will not be entitled to any additional compensation for printing and distributing these notices.

The contractor shall replace all street markings and striping damaged by construction activities.

The Contractor shall include in its Bid all costs for the above requirements.

7-10.3 Storage of Equipment and Materials in Public Streets. Construction materials shall not be stored in streets, roads, or highways for more than 5 days after unloading. All materials or



equipment not installed or used in construction within 5 days after unloading shall be stored elsewhere by the Contractor at its expense unless authorized additional storage time.

Construction equipment shall not be stored at the Work site before its actual use on the Work nor for more than 5 days after it is no longer needed. Time necessary for repair or assembly of equipment may be authorized by the Engineer.

Excavated material, except that which is to be used as backfill in the adjacent trench, shall not be stored in public streets unless otherwise permitted. After placing backfill, all excess material shall be removed immediately from the site.

7-10.4 Street Closures, Detours, Barricades. The Contractor shall comply with all applicable State, County, and City requirements for closure of streets. The Contractor shall provide barriers, guards, lights, signs, temporary bridges, flagpersons, and watchpersons. The Contractor shall be responsible for compliance with additional public safety requirements which may arise. The Contractor shall furnish and install signs and warning devices and promptly remove them upon completion of the Work.

After obtaining the Engineers approval and at least 5 working days before closing, detouring, partially closing or reopening any street, alley or other public thoroughfare the Contractor shall notify the following:

- | | |
|--|--------------|
| 1) The Engineer..... | 760-602-2720 |
| 2) Carlsbad Fire Department Dispatch | 760-931-2197 |
| 3) Carlsbad Police Department Dispatch..... | 760-931-2197 |
| 4) Carlsbad Traffic Signals Maintenance (extension 2937) | 760-438-2980 |
| 5) Carlsbad Traffic Signals Operations | 760-602-2752 |
| 6) North County Transit District..... | 760-967-2828 |
| 7) Waste Management | 760-929-9400 |

The Contractor shall comply with their requirements. The Contractor shall obtain the Engineer's written approval prior to deviating from the requirements of 2) through, and including, 7) above. The Contractor shall obtain the written approval no less than five working days prior to placing any traffic control that affects bus stops.

The Contractor shall secure approval, in advance, from authorities concerned for the use of any bridges proposed by it for public use. Temporary bridges shall be clearly posted as to load limit, with signs and posting conforming to current requirements covering "signs" as set forth in the Traffic Manual published by the California Department of Transportation. This manual shall also apply to the street closures, barricades, detours, lights, and other safety devices required.

All costs involved shall be included in the Bid.

Traffic controls shall be in accordance with the plans, The California Manual on Uniform Traffic Control Devices (FHWA MUTCD 2003 Revision 1, as amended for use in California) and these provisions. If any component in the traffic control system is damaged, displaced, or ceases to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair said component to its original condition or replace said component and shall restore the component to its original location. In the event that the Contractor fails to install and/or maintain barricades or such other traffic signs, markings, delineation or devices as may be



required herein, the Engineer may, at his/her sole option, install the traffic signs, markings, delineation or devices and charge the Contractor twenty-five dollars (\$25.00) per day per traffic sign or device, or the actual cost of providing such traffic control facility, whichever is the greater.

7-10.4.1 Construction Area Signs and Control Devices. All construction traffic signs and control devices shall be maintained throughout the duration of work in good order and according to the approved traffic control plan. All construction area signs shall conform to the provisions of Section 206-7.2 et seq. All temporary reflective pavement markers shall conform to the provisions of Section 214-5.1 et seq. All temporary reflective channelizers shall conform to the provisions of Section 214-5.2 et seq. All paint for temporary traffic striping, pavement marking, and curb marking shall conform to the provisions of Section 210-1.6 et seq. except that all temporary paint shall be rapid dry water borne conforming to Section 210-1.6 for materials and Section 310-5 et seq. For workmanship. Warning and advisory signs, lights and devices installed or placed to provide traffic control, direction and/or warning shall be furnished, installed and maintained by the Contractor. Warning and advisory signs, lights and devices shall be promptly removed by the Contractor when no longer required. Warning and advisory signs that remain in place overnight shall be stationary mounted signs. Stationary signs that warn of non-existent conditions shall be removed from the traveled way and from the view of motorists in the traveled way or shielded from the view of the traveling public during such periods that their message does not pertain to existing conditions. Care shall be used in performing excavation for signs in order to protect underground facilities. All excavation required to install stationary construction area signs shall be performed by hand methods without the use of power equipment. Warning and advisory signs that are used only during working hours may be portable signs. Portable signs shall be removed from the traveled way and shielded from the view of the traveling public during non-working hours. During the hours of darkness, as defined in Division 1, Section 280, of the California Vehicle Code, portable signs shall be illuminated or, at the option of the Contractor, shall be in conformance with the provisions in Section 206-7.2 et seq. If illuminated traffic cones rather than post-type delineators are used during the hours of darkness, they shall be affixed or covered with reflective cone sleeves as specified in CALTRANS "Standard Specifications", except the sleeves shall be 7" long. Personal vehicles of the Contractor's employees shall not be parked within the traveled way, including any Section closed to public traffic. Whenever the Contractor's vehicles or equipment are parked on the shoulder within 6' of a traffic lane, the shoulder area shall be closed with fluorescent traffic cones or portable delineators placed on a taper in advance of the parked vehicles or equipment and along the edge of the pavement at not less than 25' intervals to a point not less than 25' past the last vehicle or piece of equipment. A minimum of nine (9) cones or portable delineators shall be used for the taper. A W20-1 (Road Work Ahead) or C24 (Shoulder Work Ahead) sign shall be mounted, as required herein, on a signpost or telescoping flag tree with flags. The signpost or flag tree shall be placed where directed by the Engineer.

7-10.4.2 Maintaining Traffic. The Contractor's personnel shall not work closer than 6 feet, nor operate equipment 2 feet from any traffic lane occupied by traffic. For equipment the minimum acceptable shy distance of 2 feet shall be measured from the closest approach of any part of the equipment as it is operated and/or maneuvered in performing the work. This requirement may be waived when the Engineer has given written authorization to the reduction in clearance that is specific to the time, duration and location of such waiver, when such reduction is shown on the traffic control plans included in these contract documents, when such reduction is shown on the traffic control plans prepared by the Contractor and approved by the Engineer or for the work of installing, maintaining and removing traffic control devices. As a condition of such waiver the Engineer may require the Contractor to detour traffic, adjust the width of, or realign the adjacent traffic lane, close the adjacent traffic lane or provide barriers.



During the entire construction, a minimum of one paved traffic lane, not less than 12 feet wide, shall be open for use by public traffic in each direction of travel.

7-10.4.7 Payment. The Contractor shall provide traffic control at the contract lump sum price bid. The contract lump sum price paid for "traffic control" shall include full compensation for furnishing all labor (including flagging costs), materials (including signs), tools, equipment and incidentals, and for doing all the work involved in preparation, reproduction and changing of traffic control plans, placing, applying traffic stripes and pavement markers with bituminous adhesive, removing, storing, maintaining, moving to new locations, replacing, and disposing of the components of the traffic control system as shown on the plans and approved additions and modifications, as specified in these supplemental provisions, and as directed by the Engineer. All expenses and time to prepare and review modifications, additions, supplements and/or new TCP designs shall be included in the lump sum bid for traffic control and no additional payment will be made therefore. Flagging costs will be paid for as a part of the Lump Sum Amount for "Traffic Control." The cost of labor and material for portable concrete barriers will be paid for at the unit price bid. When there is no bid item the cost of labor and material for portable concrete barriers they will be paid as an incidental to the work being performed and no additional payment will be made therefore. Progress payments for "Traffic Control" will be based on the percentage of the improvement work completed.

7-10.5 Safety.

7-10.5.1 Safety Orders. The Contractor shall have at the Work site, copies or suitable extracts of: Construction Safety Orders, Tunnel Safety Orders and General Industry Safety Orders issued by the State Division of Industrial Safety. The Contractor shall comply with provisions of these and all other applicable laws, ordinances, and regulations.

Before excavating any trench 5 feet or more in depth, the Contractor shall submit a detailed plan to the Agency showing the design of shoring, bracing, sloping, or other provisions to be made for the workers' protection from the hazard of caving ground during the excavation of such trench. If the plan varies from the shoring system standards, the plan shall be prepared by a registered Civil Engineer. No excavation shall start until the Engineer has accepted the plan and the Contractor has obtained a permit from the State Division of Industrial Safety. A copy of the permit shall be submitted to the Engineer.

Payment for performing all work necessary to provide safety measures shall be included in the prices bid for other items of work except where separate bid items for excavation safety are provided or required by law.

7-10.5.2 Use of Explosives. Explosives may be used only when authorized in writing by the Engineer, or as otherwise stated in the Specifications. Explosives shall be handled, used, and stored in accordance with all applicable regulations.

The Engineer's approval of the use of explosives shall not relieve the Contractor from liability for claims caused by blasting operations.

7-10.5.3 Special Hazardous Substances and Processes. Materials that contain hazardous substances or mixtures may be required on the Work. A Material Safety Data Sheet as described in Section 5194 of the California Code of Regulations shall be requested by the Contractor from the manufacturer of any hazardous products used.



Material usage shall be accomplished with strict adherence to California Division of Industrial Safety requirements and all manufacturer warnings and application instructions listed on the Material Safety Data Sheet and on the product container label.

The Contractor shall notify the Engineer if a specified product cannot be used under safe conditions.

7-10.5.4 Confined Spaces.

(a) Confined Space Entry Program. The Contractor shall be responsible for implementing, administering and maintaining a confined space entry program (CSEP) in accordance with Sections 5156, 5157 and 5158, Title 8, CCR.

Prior to starting the Work, the Contractor shall prepare and submit its comprehensive CSEP to the Engineer. The CSEP shall address all potential physical and environmental hazards and contain procedures for safe entry into confined spaces, including, but not limited to the following:

1. Training of personnel
2. Purging and cleaning the space of materials and residue
3. Potential isolation and control of energy and material inflow
4. Controlled access to the space
5. Atmospheric testing of the space
6. Ventilation of the space
7. Special hazards consideration
8. Personal protective equipment
9. Rescue plan provisions

The Contractor's submittal shall include the names of its personnel, including subcontractor personnel, assigned to the project who will have CSEP responsibilities, their CSEP training, and their specific assignment and responsibility in carrying out the CSEP.

(b) Permit-Required Confined Spaces. Entry into permit-required confined spaces as defined in Section 5157, Title 8, CCR may be required as a part of the Work. All manholes, tanks, vaults, pipelines, excavations, or other enclosed or partially enclosed spaces shall be considered permit-required confined spaces until the pre-entry procedures demonstrate otherwise. The Contractor shall implement a permit space program prior to performing any work in a permit-required confined space. A copy of the permit shall be available at all times for review by Contractor and Agency personnel at the Work site.

(c) Payment. Payment for implementing, administering, and providing all equipment and personnel to perform the CSEP shall be included in the bid items for which the CSEP is required.

7-10.5.5 Safety and Protection of Workers and Public. The Contractor shall take all necessary precautions for the safety of employees on the work and shall comply with all applicable provisions of Federal, State and Municipal safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the premises where the work is being performed. The Contractor shall erect and properly maintain at all times, as required by the conditions and progress of the work, all necessary safeguards for the protection of workers and public and shall use danger signs warning against hazards created by such features of construction as protruding nails, hoists, well holes, and falling materials.



7-11 PATENT FEES OR ROYALTIES. The Contractor shall absorb in its Bid the patent fees or royalties on any patented article or process furnished or used in the Work. The Contractor shall indemnify and hold the Agency harmless from any legal action that may be brought for infringement of patents.

7-12 ADVERTISING. The names, addresses and specialties of Contractors, Subcontractors, architects, or engineers may be displayed on removable signs. The size and location shall be subject to the Engineer's approval.

Commercial advertising matter shall not be attached to or painted on the surfaces of buildings, fences, canopies, or barricades.

7-13 LAWS TO BE OBSERVED. The Contractor shall keep fully informed of State and National laws and County and Municipal ordinances and regulations which in any manner affect those employed in the Work or the materials used in the Work or in any way affect the conduct of the Work. The Contractor shall at all times observe and comply with such laws, ordinances, and regulations. Municipal ordinances that affect this work include Chapter 11.06. Excavation and Grading. If this notice specifies locations or possible materials, such as borrow pits or gravel beds, for use in the proposed construction project which would be subject to Section 1601 or Section 1603 of the Fish and Game Code, the conditions established pursuant to Section 1601 et seq. of the Fish and Game Code shall become conditions of the contract.

7-14 ANTITRUST CLAIMS. Section 7103.5 of the Public Contract Code provides:

"In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the contractor or subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec 15) or Cartwright Act (Chapter 2 [commencing with Section 16700] of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the public works contract or subcontract. The assignment shall be made and become effective at the time the awarding body tenders final payment to the contractor, without further acknowledgment of the parties."



SECTION 8 – FACILITIES FOR AGENCY PERSONNEL

8-1 General. Contractor is not required to provide Field Office Facilities for use of the Engineering Inspector, provided that Contractor furnishes a facility for weekly Owner-Contractor meetings. All costs incurred in furnishing facilities for weekly meetings at the project site shall be included in the lump sum bid item for **General Conditions** and no other payments will be made.

SECTION 9 – MEASUREMENT AND PAYMENT

9-1 MEASUREMENT OF QUANTITIES FOR UNIT PRICE WORK.

9-1.1 General. Unless otherwise specified, quantities of work shall be determined from measurements or dimensions in horizontal planes. However, linear quantities of pipe, piling, fencing and timber shall be considered as being the true length measured along longitudinal axis.

Unless otherwise provided in Specifications, volumetric quantities shall be the product of the mean area of vertical or horizontal sections and the intervening horizontal or vertical dimension. The planimeter shall be considered an instrument of precision adapted to measurement of all areas.

9-1.2 Methods of Measurement. Materials and items of work which are to be paid for on basis of measurement shall be measured in accordance with methods stipulated in the particular sections involved.

9-1.3 Certified Weights. When payment is to be made on the basis of weight, the weighing shall be done on certified platform scales or, when approved by the Engineer, on a completely automated weighing and recording system. The Contractor shall furnish the Engineer with duplicate licensed weighmaster's certificates showing actual net weights. The Agency will accept the certificates as evidence of weights delivered.

9-1.4 Units of Measurement. The system of measure for this contract shall be the U.S. Standard Measures.

9-2 LUMP SUM WORK. Items for which quantities are indicated "Lump Sum", "L.S.", or "Job", shall be paid for at the price indicated in the Bid. Such payment shall be full compensation for the items of work and all work appurtenant thereto.

When required by the Specifications or requested by the Engineer, the Contractor shall submit to the Engineer within 15 days after award of Contract, a detailed schedule in triplicate, to be used only as a basis for determining progress payments on a lump sum contract or designated lump sum bid item. This schedule shall equal the lump sum bid and shall be in such form and sufficiently detailed as to satisfy the Engineer that it correctly represents a reasonable apportionment of the lump sum.



9-3 PAYMENT

9-3.1 General. The quantities listed in the Bid schedule will not govern final payment. Payment to the Contractor will be made only for actual quantities of Contract items constructed in accordance with the Plans and Specifications. Upon completion of construction, if the actual quantities show either an increase or decrease from the quantities given in the Bid schedule, the Contract Unit Prices will prevail subject to the provisions of Section 3-2.2.1.

The unit and lump sum prices to be paid shall be full compensation for the items of work and all appurtenant work, including furnishing all materials, labor, equipment, tools, and incidentals.

Payment will not be made for materials wasted or disposed of in a manner not called for under the Contract. This includes rejected material not unloaded from vehicles, material rejected after it has been placed, and material placed outside of the Plan lines. No compensation will be allowed for disposing of rejected or excess material.

Payment for work performed or materials furnished under an Assessment Act Contract will be made as provided in particular proceedings or legislative act under which such contract was awarded.

Whenever any portion of the Work is performed by the Agency at the Contractor's request, the cost thereof shall be charged against the Contractor, and may be deducted from any amount due or becoming due from the Agency.

Whenever immediate action is required to prevent injury, death, or property damage, and precautions which are the Contractor's responsibility have not been taken and are not reasonably expected to be taken, the Agency may, after reasonable attempt to notify the Contractor, cause such precautions to be taken and shall charge the cost thereof against the Contractor, or may deduct such cost from any amount due or becoming due from the Agency. Agency action or inaction under such circumstances shall not be construed as relieving the Contractor or its Surety from liability.

Payment shall not relieve the Contractor from its obligations under the Contract; nor shall such payment be construed to be acceptance of any of the Work. Payment shall not be construed as the transfer of ownership of any equipment or materials to the Agency. Responsibility of ownership shall remain with the Contractor who shall be obligated to store any fully or partially completed work or structure for which payment has been made; or replace any materials or equipment required to be provided under the Contract which may be damaged, lost, stolen or otherwise degraded in any way prior to acceptance of the Work, except as provided in Section 6-10.

Guarantee periods shall not be affected by any payment but shall commence on the date of recordation of the "Notice of Completion."

If, within the time fixed by law, a properly executed notice to stop payment is filed with the Agency, due to the Contractor's failure to pay for labor or materials used in the Work, all money due for such labor or materials will be withheld from payment to the Contractor in accordance with applicable laws.

At the expiration of 35 days from the date of acceptance of the Work by the Board, or as prescribed by law, the amount deducted from the final estimate and retained by the Agency will be paid to the Contractor except such amounts as are required by law to be withheld by properly



executed and filed notices to stop payment, or as may be authorized by the Contract to be further retained.

9-3.2 Partial and Final Payment. The Engineer will, after award of Contract, establish a closure date for the purpose of making monthly progress payments. The Contractor may request in writing that such monthly closure date be changed. The Engineer may approve such request when it is compatible with the Agency's payment procedure.

Each month, the Engineer will make an approximate measurement of the work performed to the closure date as basis for making monthly progress payments. The estimated value will be based on contract unit prices, completed change order work and as provided for in Section 9-2 of these General Provisions. Progress payments shall be made no later than thirty (30) calendar days after the closure date. Five (5) working days following the closure date, the Engineer shall complete the detailed progress pay estimate and submit it to the Contractor for the Contractor's information. Should the Contractor assert that additional payment is due, the Contractor shall within ten (10) days of receipt of the progress estimate, submit a supplemental payment request to the Engineer with adequate justification supporting the amount of supplemental payment request. Upon receipt of the supplemental payment request, the Engineer shall, as soon as practicable after receipt, determine whether the supplemental payment request is a proper payment request. If the Engineer determines that the supplemental payment request is not proper, then the request shall be returned to the Contractor as soon as practicable, but not later than seven (7) days after receipt. The returned request shall be accompanied by a document setting forth in writing the reasons why the supplemental payment request was not proper. In conformance with Public Contract Code Section 20104.50, the City shall make payments within thirty (30) days after receipt of an undisputed and properly submitted supplemental payment request from the Contractor. If payment of the undisputed supplemental payment request is not made within thirty (30) days after receipt by the Engineer, then the City shall pay interest to the Contractor equivalent to the legal rate set forth in subdivision (a) of Section 685.010 of the Code of Civil Procedure.

From each progress estimate, **5 percent** will be deducted and retained by the Agency, and the remainder less the amount of all previous payments will be paid. After 50 percent of the Work has been completed and if progress on the Work is satisfactory, the deduction to be made from remaining progress estimates and from the final estimate may be limited to \$500 or 10 percent of the first half of total Contract amount, whichever is greater.

No progress payment made to the Contractor or its sureties will constitute a waiver of the liquidated damages under 6-9.

As provided in Section 22300 of the California Public Contract Code, the Contractor may substitute securities for any monies withheld by the Agency to ensure performance under the Contract.

After final inspection, the Engineer will make a Final Payment Estimate and process a corresponding payment. This estimate will be in writing and shall be for the total amount owed the Contractor as determined by the Engineer and shall be itemized by the contract bid item and change order item with quantities and payment amounts and shall show all deductions made or to be made for prior payments and amounts to be deducted under provisions of the contract. All prior estimates and progress payments shall be subject to correction in the Final Payment Estimate.

The Contractor shall have 30 calendar days from receipt of the Final Payment Estimate to make written statement disputing any bid item or change order item quantity or payment amount. The



Contractor shall provide all documentation at the time of submitting the statement supporting its position. Should the Contractor fail to submit the statement and supporting documentation within the time specified, the Contractor acknowledges that full and final payment has been made for all contract bid items and change order items.

If the Contractor submits a written statement with documentation in the aforementioned time, the Engineer will review the disputed item within 30 calendar days and make any appropriate adjustments on the Final Payment. Remaining disputed quantities or amounts not approved by the Engineer will be subject to resolution as specified in Section 3-5, Disputed Work.

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

9-3.2.1 Payment for Claims. Except for those final payment items disputed in the written statement required in Section 9-3.2 all claims of any dollar amount shall be submitted in a written statement by the Contractor no later than the date of receipt of the final payment estimate. Those final payment items disputed in the written statement required in Section 9-3.2 shall be submitted no later than 30 days after receipt of the Final Payment estimate. No claim will be considered that was not included in this written statement, nor will any claim be allowed for which written notice or protest is required under any provision of this contract including Sections 3-4 Changed Conditions, 3-5 Disputed Work, 6-6.3 Payment for Delays to Contractor, 6-6.4 Written Notice and Report, or 6-7.3 Contract Time Accounting, unless the Contractor has complied with notice or protest requirements.

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

Payment for claims shall be processed within 30 calendar days of their resolution for those claims approved by the Engineer. The Contractor shall proceed with informal dispute resolution under Section 3-5, Disputed Work, for those claims remaining in dispute.

9-3.3 Delivered Materials. The cost of materials and equipment delivered but not incorporated into the work will not be included in the progress estimate.

9-3.4.1 Mobilization and Preparatory Work. Payment for mobilization and preparatory Work will be included in the Bid Item for General Conditions and no other payment will be made.

9-4 BID ITEMS. Payment for each Bid Item shall be made at the quantity and type as listed in the Contractor's Proposal. All work shown or mentioned on the plans, in the Contract Documents, General Provisions, or Technical Provisions/Specifications shall be considered as included in the Bid Items. Contractor must protect existing utilities, improvements, landscaping, irrigation systems, and vegetation in place. If damaged during the work, Contractor is responsible to repair



or replace any utilities, improvements, landscaping, irrigation systems, and vegetation at his expense.

Bid Item No. A-1: General Conditions

The contract lump sum price paid for this bid item shall constitute full compensation for the costs of all pre- and post-construction preparatory work and operations which must be performed or for costs incurred prior to commencing/concluding work on the various contract items on the project site and no other compensation will be allowed therefor. This item shall include but not be limited to the following items: mobilization/demobilization and lay-down area; obtaining and paying for all required bonds, insurance policies (including premiums and incidentals), and permits if applicable; submittal of required materials and shop drawings, baseline construction schedule(s) and 3-week look ahead schedule; establishment of all offices, buildings, construction yards, fencing, sanitary facilities, and any other facilities necessary for work at all project sites; utility services for construction facilities; posting all OSHA required notices and establishment of safety programs; the movement of personnel, equipment, supplies, and incidentals to all project sites; developing and installing construction water supply; notification of residents and businesses; and all utility coordination, utility locating, potholing and mark out; and shall include all labor, materials, tools, equipment, and incidentals in accordance with the latest regulatory requirements, the plans, and contract documents and no other compensation will be allowed therefor.

No additional compensation will be allowed for additional mobilization(s)/demobilizations(s) required, including but not limited to delays caused by the relocation of existing utility facilities shown on the plans or discovered during construction operations.

The deletion of work or the addition of extra work as provided for herein shall be reflected in Contract Change Orders and shall not affect the price paid for "General Conditions."

Payment for "General Conditions" shall be made in equal increments of 50% after full mobilization and site preparation is complete, and 50% upon punch list completion, full demobilization, site restoration, and project acceptance by the Agency.

Bid Item No. A-2: Traffic Control

The contract lump sum price paid for this bid item shall constitute full compensation to furnish traffic control in accordance with the latest regulatory requirements, the plans, and contract documents. This work shall include, but not be limited to designing, completion and implementation of traffic control plans, obtaining the necessary permits per latest regulations, installation and maintenance of the traffic control equipment throughout the duration of all work affecting traffic and no other compensation will be allowed therefor.

Bid Item No. A-3 Surveying and Construction Staking: (including horizontal control plan)

The contract lump sum price paid for this bid item shall constitute full compensation for furnishing all labor, materials, tools, and equipment, and for doing all site survey and staking work associated with the project and developing a horizontal control plan in accordance with the latest regulatory requirements, the plans, and contract documents and no additional compensation shall be allowed therefor.

Construction Survey Staking shall conform to Section 2-9 of the Standard Specifications and Supplementary General Provisions and shall include, but not be limited to, providing construction centerlines, staking, and coordination as required for construction of the improvements shown on the plans, and as required in the General Provisions of these Specifications.



Contractor shall be responsible for familiarity with the Americans with Disabilities Act ("ADA") (42 U.S.C. § 12101 et seq.) and all other federal and state disability access laws, codes and regulations. The Work will be performed in compliance with all current rules, guidelines and regulations, including, but not limited to, meeting all required vertical, horizontal, slope and all other dimensional requirements.

The contractor shall be responsible to ensure and verify that that all temporary and finished sidewalk, ramp, entry access grades, and travel paths strictly meet ADA requirements, including using a 2-foot long electronic smart level or other approved measuring device. General construction tolerances are unacceptable. If these requirements cannot be met with the existing grades or other physical or practical limitations, Contractor shall immediately notify City for direction before work takes place. Contractor shall be responsible for the costs of any corrective work due to contractor's failure to meet these requirements.

The Contractor is responsible for providing project construction staking or station control. The Contractor shall notify the inspector five (5) days in advance of conducting the construction staking or station control.

Bid Item No. A-4: Erosion Control, SWPPP Preparation, Implementation and Maintenance

The contract lump sum price paid for the BMPs and Erosion Control work and shall constitute full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing the work involved in installing and maintaining any and all storm water BMPs for the duration of the project, as specified herein, and as directed by the Engineer and no additional compensation shall be allowed therefor. This work shall include preparing, obtaining approvals, revising and amending the project SWPPP, installing, constructing, maintaining, removing and disposing of all Best Management Practices (BMPs) specified in the SWPPP and as required by applicable codes and in strict accordance with the State Water Board, maintenance of storm water and non-storm water best management practices (BMPs) throughout the duration of all Work. These requirements shall also apply to any offsite storage yards or construction laydown areas utilized for this project. The lump sum bid price shall include payment of application and annual fees required by the SDRWCB until the date of the projects' substantial completion and no additional compensation shall be allowed therefor.

Bid Item No. A-5: Demolition, Clearing and Grubbing

The contract lump sum price shall constitute full compensation for furnishing all labor, materials, tools, equipment and incidentals for doing all work associated with demolition, clearing and grubbing activities including, but not limited to removing and disposing of all asphalt, chain link fence, concrete, turf, landscaping, existing improvements and other materials in accordance with the plans and contract documents and no other compensation will be allowed therefor.

Clearing and grubbing shall conform to Section 300-1 of the Standard Specifications and Supplementary General Provisions and shall consist of the protection of all items to remain, saw-cutting, demolition and disposal of existing improvements, salvaging existing materials (topsoil) and improvements as specified or shown on the Plans, removal of deleterious materials, and proper disposal from the Project site of all existing surface and subsurface materials as required to construct the improvements as shown on the Plans and as described in the Specifications. All removed materials not indicated for salvage, re-use or re-cycle shall become the property of the Contractor and shall be disposed of offsite at a legal site or recycling facility.



Bid Item No. A-6: Grading

The contract lump sum price for this bid item shall constitute full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work associated with site grading and no additional compensation shall be allowed therefore. This work shall include the cost of importing fill material, grading onsite material and use of the cut and fill of onsite material for the grading operations as shown on Drawings or directed by the Engineer. The recommendations within the project's soil report, Geotechnical Evaluation prepared by Ninyo & Moore dated February 13, 2015, shall be incorporated into this work.

Bid Item No. A-7: Drainage

The contract lump sum price shall constitute full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work associated with site drainage and no additional compensation shall be allowed therefor. This work shall consist of constructing all site drainage and storm drain improvements, including connecting the proposed storm drain to the existing inlet; furnishing and installing a Type F catch basin per San Diego Regional Standard Drawing D-07; furnishing and installing 24" precast grate inlets per Brooks product 2424CB; furnishing and installing of 12" PVC (SDR 26) storm drain, together with all the connections to the existing inlet and cleanout structures; and including but not limited to connections, earthwork, shoring, bracing, bedding, backfilling, compaction, materials testing, concrete, frames and covers, and other incidentals as shown on the Drawings and in accordance with the Contract Documents.

Bid Item No. A-8: Replace Curb, Gutter & Sidewalk and Pedestrian Ramp

The contract lump sum price for this bid item shall constitute full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work associated with installing a pedestrian ramp, and curb gutter & sidewalk as specified herein and no additional compensation shall be allowed. This work shall consist of demolition of existing affected area, furnishing and installing an ADA compliant pedestrian ramp at the corner of Glasgow Dr. and Carlsbad Village Dr., and constructing a section of curb, gutter and sidewalk on Glasgow Dr. at the locations shown on the drawings and in accordance with the Sections 201 and 303-5 of the Supplementary General Provisions of the Standard Specifications, and the City of Carlsbad Engineering Standards.

Bid Item No. A-9: Colored Concrete Pavement

The contract lump sum price shall constitute full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work associated with installing colored concrete pavement at the locations shown on the Drawings and in accordance with the Contract Documents, herein and no additional compensation shall be allowed therefor.

Bid Item No. A-10: Colored Concrete Pavement with Exposed Aggregate Finish

The contract lump sum price shall constitute full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work associated with installing colored concrete pavement with exposed aggregate finish at the locations shown on the Drawings and in accordance with the Contract Documents herein, and no additional compensation shall be allowed therefor. The pavement shall match the existing aggregate pavement at the entrance to the community center.

Bid Item No. A-11: Natural Color Concrete Pavement

The contract lump sum price shall constitute full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work associated with installing natural color concrete pavement at the locations shown on the Drawings and in accordance with the Contract Documents herein, and no additional compensation shall be allowed therefor. This work shall



consist of furnishing and installing natural color concrete pavement including a 4" concrete path and thickened edge, 8" mow curb and resilient surface edging, 8" curb at exercise area, and 8" X 8" thickened edging, per the Drawings in accordance with Sections 201 and 303-5 of the Supplementary General Provisions of the Standard Specifications.

Bid Item No. A-12: Concrete Stairs with Railing

The contract lump sum price shall constitute full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work associated with installing concrete stairs with metal railing as shown on the Drawings and in accordance with the Contract Documents herein, and no additional compensation shall be allowed therefor.

Bid Item No. A-13: Poured in Place Resilient Surfacing

The contract lump sum price shall constitute full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work associated with installing poured in place resilient surfacing at the locations shown on the Drawings and in accordance with the Contract Documents herein, and no additional compensation shall be allowed therefor.

Bid Item No. A-14: Pre-Engineered Fabric Shade Structures

The contract lump sum price shall constitute full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work associated with furnishing and installing all pre-engineered fabric shade structures at the locations shown on the Drawings and in accordance with the Contract Documents herein, and no additional compensation shall be allowed therefor. The pre-engineered shade structures shall be manufactured by USA Shade or pre-approved equal and installed per the manufacturer's specifications.

Bid Item No. A-15: Outdoor Fitness Equipment

The contract lump sum price shall constitute full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work associated with furnishing and installing all outdoor fitness equipment as shown on the Drawings and in accordance with the contract documents herein, and no additional compensation shall be allowed therefor. The outdoor fitness equipment shall be manufactured by Landscape Structures, Inc or approved equal and installed per the manufacturer's specifications.

Bid Item No. A-16: Site Amenities

The contract lump sum price shall constitute full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work associated with furnishing and installing all site amenities including, but not limited to picnic tables, benches, trash and recycling receptacles, barbeques, bike racks, signs, drinking fountain (including water line and connection to water service), bollards, and other amenities not included as separate bid items, as shown on the Drawings and in accordance with the contract documents herein, and no additional compensation shall be allowed therefor. Site amenities shall be installed per the manufacturer's specifications unless noted otherwise.

Bid Item No. A-17: Seat wall with Stone Veneer

The contract lump sum price shall constitute full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work associated with constructing a 16" high seat wall with stone veneer and poured in place concrete cap in the locations shown on the Drawings and in accordance with the contract documents herein, and no additional compensation shall be allowed therefor.



Bid Item No. A-18: Barbeque Prep Table with Poured in Place (PIP) Concrete Counter Top and Stone Veneer

The contract lump sum price shall constitute full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work associated with furnishing and constructing a 34" high, ADA compliant serving counter with a stone veneer and a poured in place PCC countertop in the locations shown on the Drawings and in accordance with the contract documents herein, and no additional compensation shall be allowed therefor.

Bid Item No. A-19: Landscape Boulders

The contract lump sum price for shall constitute full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work associated with furnishing and installing the landscape boulders in the sizes and locations shown in the Drawings and in accordance with the contract documents herein, and no additional compensation shall be allowed therefor. The boulders shall be Desert Sand, available from Southwest Boulders and Stone or approved equal.

Bid Item No. A-20: Electrical Improvements

The contract lump sum price for shall constitute full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work associated with furnishing and installing all lighting fixtures and the complete electrical system, (NOT including lighting for two boulder monument signs), as per the Electrical and Lighting plans and in accordance with the contract documents herein, and no additional compensation shall be allowed therefor.

Bid Item No. A-21: Irrigation System

The contract lump sum price shall constitute full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work associated with construction and installation of the irrigation system, as shown in the Drawings and in accordance with the contract documents herein, and no additional compensation shall be allowed therefor.

Bid Item No. A-22: Planting

The contract lump sum price and shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work associated with furnishing and installing all plant materials, including soil preparation, fine grading, mulch, and associated items as shown on the Drawings and per the Landscaping Specifications and contract documents herein, and no additional compensation shall be allowed therefor.

Bid Item No. A-23: 120-Day Plant Maintenance Period

The contract lump sum price for 120-Day Plant Maintenance Period shall constitute full compensation for furnishing all labor, materials, materials, tools, equipment, and all other work and incidentals necessary to accomplish the work as specified herein and no additional compensation shall be allowed therefor.

The Contractor shall maintain planted areas on a continuous basis as they are completed during the progress of the work and after acceptance of the landscape installation by the Engineer. Upon completion of the maintenance period, a final inspection for acceptance will be performed by the Engineer. If the irrigation and planting are not found acceptable by the Engineer after the time indicated, the maintenance period may be extended at the Contractor's expense until found acceptable by the Engineer. The maintenance period shall be 120 days from Substantial Completion. Landscaping maintenance shall conform to Specifications and as detailed in the plan set.



Bid Item No. A-24: Record Drawings

The contract lump sum price for this bid item shall constitute full compensation to keep on the job site and maintain daily, a clean, accurate, full-size and legible print set of Project plans that indicate all changes in work, modifications and existing conditions that are different from what is shown on the Plans. The Contractor shall record the location and elevations of all surface improvements in the City of Carlsbad. The survey shots shall be provided to the satisfaction of the Engineer, so minimum slopes can be verified. The Contractor shall record, by dimension and/or scale drawings, facilities as actually installed. All information necessary to maintain and/or service any concealed work shall be noted on the record drawings. Records shall be kept up to date. The Contractor shall make the Record Drawings available for review by the Engineer at any time and shall provide a clean final copy to the City within two weeks of the contract completion date.

Bid Alternate Item No. B-1: Boulder Monument Signs

The contract lump sum price for this bid item shall constitute full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work associated with installing two boulder monument signs and associated electrical system for lighting the monument signs, in the locations shown in the Drawings and in accordance with the contract documents herein, and no additional compensation shall be allowed therefor. The boulders for the monument signs are available from Southwest Boulders and Stone or another local source. The contractor is responsible for purchase, delivery and installation as depicted in the locations shown on the Drawings. Prior to delivery, the contractor shall submit shop drawings for boulder engraving and boulder installation to the Engineer for review and approval. This work shall also consist of removing the existing monument sign at Glasgow Dr. and Middleton Dr.



SUPPLEMENTAL PROVISIONS TO STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION PART 2, CONSTRUCTION MATERIALS

SECTION 200 - ROCK MATERIALS

200-1 ROCK PRODUCTS

Add the following paragraph to this subsection:

200-1.1 General. In accordance with the provisions of Section 20676 of the State of California Public Contract Code, it shall be mandatory upon the Contractor to whom the Contract is awarded, and upon all subcontractors and suppliers under him, to obtain all construction aggregate, sand, gravel, crushed stone, road base, fill materials, and any other mineral materials, including those used in other construction materials such as asphalt concrete and Portland Cement concrete, from a supplier that is included on the most current Office of Mine Reclamation AB 3098 List (per California Assembly Bill 3098). Failure to identify the supplier and the mine may result in rejection of the submittal, and any work completed using materials from an unlisted mine will be SUBJECT TO REJECTION.

Add the following section:

200-1.2.2 Permeable Material. Permeable material shall consist of hard, durable, clean sand, gravel, or crushed stone, and shall be free from organic material, clay balls, or other deleterious substances. Class 1 and Class 2 permeable material shall have a Durability Index of not less than 40. Class 2 Permeable material shall have a Sand Equivalent value of not less than 75. Class 1 permeable material shall conform to the requirements in this section and Table 200-1.2.2(A). Class 2 permeable material shall conform to the requirements in this section and Table 200-1.2.2(B). When permeable material is required and the class or kind is not specified, Class 1 permeable material shall be used. The alternative gradings within Class 1 permeable material are identified by types. Unless otherwise shown on the plans the Contractor will be permitted to furnish and place any one of the types provided for this class. The percentage composition by mass of permeable material in place shall conform to the gradings in Tables 200-1.2.2(A) and 200-1.2.2(B).

**TABLE 200-1.2.2(A)
CLASS 1 PERMEABLE MATERIAL**

Sieve Sizes	Percentage Passing	
	Type A	Type B
50-mm (2")	---	100
37.5-mm (1½")	---	95-100
19-mm (¾")	100	50-100
12.5-mm (½")	95-100	---
9.5-mm (⅜")	70-100	15-55
4.75-mm (No. 4)	0-55	0-25
2.36-mm (No. 8)	0-10	0-5
75-µm (no. 200)	0-3	0-3



TABLE 200-1.2.2(B)
CLASS 2 PERMEABLE MATERIAL

Sieve Sizes	Percentage Passing
25-mm (1")	100
19-mm (3/4")	90-100
9.5-mm (3/8")	40-100
4.75-mm (No. 4)	25-40
2.36-mm (No. 8)	18-33
600-µm (No. 30)	5-15
300-µm (No. 50)	0-7
75-µm (no. 200)	0-3

200-1.6 Landscape Boulders

Landscape boulders shall be "Desert Sand" as supplied by Southwest Boulder & Stone, 5002 2nd Street, Fallbrook, California 92028, (760) 451-3333, or approved equal.

Shape: Rounded in character with no sharp edges.

Size: Shall be as indicated on the Plans and Drawings.

Contractor shall submit photographs of representative samples for review and approval by the City prior to ordering and installation.

200-2 UNTREATED BASE MATERIALS

200-2.1 General. Add the following:

Aggregate base shall be Class 2 per Subsection 26-1.02A, "Class 2 Aggregate Base" of the Caltrans Standard Specifications and associated AGGREGATE GRADING REQUIREMENTS and QUALITY REQUIREMENTS tables or Crushed Aggregate Base per Subsection 200-2.2 ("Crushed Aggregate Base.") and as shown in the gradation in TABLE 200-2.2.2 of Subsection 200-2.2.2 ("Grading.") of the Greenbook.

Aggregate may include up to one hundred percent (100%) material processed from reclaimed asphalt concrete, Portland Cement concrete, lean concrete base, cement treated base or a combination of any of these materials. It should be noted, this does not change the specification requirements for material or placement quality. It is still the Contractor's responsibility to verify that any blend of reclaimed paving materials with or without virgin materials shall meet all the specification requirements.

Add the following section:

200-2.7 Class 2 Aggregate Base. Aggregate for Class 2 aggregate base shall be free from organic matter and other deleterious substances and shall be of such nature that it can be compacted readily under watering and rolling to form a firm, stable base. Aggregate may include material processed from reclaimed asphalt concrete, portland cement concrete, lean concrete base, cement treated base or a combination of any of these materials.

Aggregate shall conform to the grading and quality requirements shown in the following tables. At the option of the Contractor, the grading for either the 1 1/2-inch maximum or 3/4 inch maximum



shall be used, except that once a grading is selected it shall not be changed without the Engineer's written approval.

**AGGREGATE GRADING REQUIREMENTS
PERCENTAGE PASSING**

Sieve Sizes	Operating Range	
	1 1/2" Maximum	3/4" Maximum
2"	100	--
1 1/2"	90-100	--
1"	--	100
3/4"	50-85	90-100
No. 4	25-45	35-60
No. 30	10-25	10-30
No. 200	2-9	2-9

QUALITY REQUIREMENTS

Tests	Operating Range
Resistance (R-value)	78 Min.
Sand Equivalent	25 Min.
Durability Index	35 Min.

The aggregate shall not be treated with lime, cement or other chemical material before the Durability Index test is performed.

If the results of either or both the aggregate grading and Sand Equivalent tests do not meet the requirements specified for "Operating Range" but meet the "Contract Compliance" requirements, placement of the aggregate base may be continued for the remainder of that day. However, another day's work may not be started until tests, or other information, indicate to the satisfaction of the Engineer that the next material to be used in the work will comply with the requirements specified for "Operating Range."

If the results of either or both the aggregate grading and Sand Equivalent tests do not meet the requirements specified for "Contract Compliance," the aggregate base which is represented by these tests shall be removed. However, if requested by the Contractor and approved by the Engineer, the aggregate base may remain in place and the Contractor shall pay to the City \$2.25 per cubic yard for such aggregate base left in place. The City may deduct this amount from any moneys due, or that may become due, the Contractor under the contract. If both the aggregate grading and Sand Equivalent do not conform to the "Contract Compliance" requirements, only one adjustment shall apply.

No single aggregate grading or Sand Equivalent test shall represent more than 500 cubic yards or one day's production, whichever is smaller.



SECTION 201 - CONCRETE, MORTAR, AND RELATED MATERIALS

201-1 PORTLAND CEMENT CONCRETE

201-1.1.1 General.

Add the following paragraph to this subsection after the first paragraph:

201-1.1.1 General. Contractor shall furnish the Engineer a copy of the mix design to be used and with legible certified weight-master's certificate for each load of PCC delivered to the Work. Portland Cement concrete delivered to the project site having a water content and/or slump greater than that specified in the mix design shall be rejected and removed from the Work site.

TABLE 201-1.1.2(A) Modify as follows:

**TABLE 201-1.1.2(A) ⁽³⁾
PORTLAND CEMENT CONCRETE**

Type of Construction	Concrete Class	Maximum Slump mm (Inches)
All Concrete Used Within the Right-of-Way	330-C-23 (560-C-3250) ⁽¹⁾	⁽²⁾
Street Light Foundations and Survey Monuments	330-C-23 (560-C-3250)	100 (4")

⁽¹⁾ Except that concrete required to be of higher strength by Table 201-1.1.2(A) SSPWC shall be as per Table 201-1.1.2(A) SSPWC.

⁽²⁾ As per Table 201-1.1.2(A) SSPWC.

⁽³⁾ Portions of Table 201-1.1.2(A) of the Standard Specifications for Public Works Construction not shown herein as changed are not affected by this table.

201-1.2 Materials.

201-1.2.4 Chemical Admixtures. Revise paragraph (b) of this subsection to read as follows:

(b) Accelerating Admixtures. Calcium Chloride shall not be used as an admixture. Other accelerating admixtures shall conform to ASTM C 494, accelerating (Type C), or water-reducing and accelerating (Type E) admixtures, shall be approved by the Engineer prior to use.

Revise paragraph (e) of this subsection to read as follows:

(d) Air-entraining Admixtures. Substitute the following: The air content shall not deviate from the percentage specified or permitted by more than 1-1/2 percentage points. The air content of freshly mixed concrete will be determined by California Test Method No. 504.

201-1.4.4 Hand Mixing. Replace the first sentence with the following:

201-1.4.4 Hand Mixing. Hand mixing concrete shall not be allowed except by prior permission from the Engineer and, if permitted, only when the amount of concrete required is less than one cubic yard (1 yd.³). Prepackaged unmixed concrete shall not be allowed except by prior permission from the Engineer.

Add the following:

f) Integral Color Admixture. Integral color shall be as specified on the Plans.



201-3 EXPANSION JOINT FILLER AND JOINT SEALANTS

201-3.1 General. Replace the second paragraph of this subsection with the following: All expansion joints shall be formed with joint filler and sealed with Type “A” two-part polyurethane sealant per Subsection 201-3.4 (“Type “A” Sealant (Two-Part Polyurethane Sealant”). The filler shall be placed in the correct position before concrete is placed against it. Holes or joints in the joint filler shall be filled with joint sealant to prevent the passage of mortar or concrete from one side of the joint to the other.

201-3.4 Type “A” Sealant (Two-Part Polyurethane Sealant). Add the following: All finished concrete surfaces shall have a ½” continuous expansion joint at locations indicated on the plans and notes and shall be located either parallel to perpendicular to the curb line. When not otherwise indicated, all expansion joints located adjacent to colored concrete shall be sealant Type “A” and colored to match the color of the concrete surface.

Contractor shall provide joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.

Contractor shall submit product data from the manufacturer of each joint sealant product required, including instructions for joint preparation and joint sealer application. Contractor shall also submit samples for initial selection purposes in form of manufacturer’s standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view. Samples shall be submitted to Engineer. Submit complete schedule of type (and location where type is to be used) of each sealant.

Contractor shall engage an experienced installer who has completed joint sealant applications similar in material, design and extent to that indicated for Project that have resulted in construction with a record of successful in-service performance.

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

Provide color selections made by Engineer from manufacturer’s full range of standard colors for products of type indicated. Sealant color parallel to curbline shall match color of Paving Treatment Type “A” as specified in Section 201-1.2.4(a) of these Special Provisions.

Joint sealants shall be multi-component polyurethane sealant. Except as otherwise indicated, provide manufacturer’s standard, non-modified, 2-or-more-part, polyurethane-based, elastomeric sealant; complying with either ASTM-C-920-87, Type M, Grade P, Class 25, or FS TT-S 0227E Class A, non-sag, Type II.

Acceptable Products: “Sonneborn NP11”; Sonneborn Building Products Division; “Scofield Lithoseal Trafficalk 3-G”, L.M. Scofield Company; or equivalent, as approved by the Engineer.

Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.



Plastic foam joint fillers shall be pre-formed, compressible, resilient, non-staining, non-waxing, non-extruding strips of flexible plastic foam either open-cell polyurethane foam or closed-cell polyethylene foam, subject to approval of sealant manufacturer, for cold-applied sealants only. Polystyrene foam is not acceptable.

Add the following sections:

201-10 CONCRETE FINISH RETARDER FOR EXPOSED AGGREGATE CONCRETE.

201-10.1 General. Spray applied film forming, water based top surface retarder calibrated for specific sized aggregate and finish requirements.

201-10.1.1 Material. "Top Cast" Grade 05 (sand blast) surface retarder by Grace Construction Products (888-336-9303) or approved equal for the pedestrian concrete paving.

201-10.2 Protective Coating. Spray applied film forming protective coating for surfaces adjacent to retarded finish surfaces.

201-10.2.1 Acceptable Materials. "Face Off" by Grace Construction Products (888-336-9303) or approved equal.

SECTION 206 - MISCELLANEOUS METAL ITEMS

Add the following section:

206-7 TRAFFIC SIGNS.

206-7.2 Temporary Traffic Signs. Temporary traffic signs shall consist of all signs used for the direction, warning, and regulation of vehicle (including bicycle) and pedestrian traffic during the Contractor's performance of the Work. Temporary traffic signs include both stationary and portable signs.

206-7.2.1 General. Materials, legend, proportion, size, and fabrication of all temporary traffic signs used for the direction, warning, and regulation of vehicle (including bicycle) and pedestrian traffic shall conform to the requirements of "Specifications For Reflective Sheeting Signs, October 1993", Sheets 1 through 5 that accompany "Specifications For Reflective Sheeting Signs, October 1993" of dimensions and details, dated April 1987, and "OPAQUE COLOR CHART", dated February 1980, all published by the State of California, Department of Transportation, Division of Procurement Services, Office of Material Operations, 1900 Royal Oaks Drive, Sacramento, CA 95819 and as modified herein. Where The "Specification For Reflective Sheeting Signs, October 1993" require the Contractor or supplier to notify the Department of Transportation or to certify compliance to said "Specifications For Reflective Sheeting Signs, October 1993", to provide a quality control program or to allow testing, approval, observation of manufacturing or assembly operations by the State of California, Department of Transportation and/or its employees or officials, such rights shall be vested in the Engineer.

206-7.2.2 Drawings. Modify the "Specifications for Reflective Sheeting Signs, October 1993" as follows: Standard temporary traffic signs shall be as per the most recently approved "Approved Sign Specification Sheets" of the State of California, Department of Transportation. The date of approval shall be the date most closely preceding the date of manufacture of the sign(s) or the date of the "Notice to Proceed" of this contract, whichever is most recent.



206-7.2.3 Reflective Sheeting. Modify the “Specifications for Reflective Sheeting Signs, October 1993” as follows: All advisory signs, warning signs and all regulatory signs shall be fabricated with Type III encapsulated lens sheeting conforming to the requirements of this specification.

206-7.2.4 Substrate. Modify the “Specifications for Reflective Sheeting Signs, October 1993” as follows: Excepting only construction warning signs used at a single location during daylight hours for not more than five (5) consecutive days, all signs used for the direction, warning, and regulation of vehicle (including bicycle) and pedestrian traffic shall be stationary mounted and shall use aluminum substrate.

206-7.2.5 Stationary Mounted Temporary Traffic Signs. Stationary mounted temporary traffic signs shall be installed on 10-gage and 12-gage cold-rolled steel perforated tubing posts in the same manner shown on the State of California, Department of Transportation Standard Plans RS1, RS2, RS3 and RS4 for installation of roadside signs, except as follows:

- a) Wood posts shall not be used.
- b) Back braces and blocks for sign panels will not be required.
- c) The height to the bottom of the sign panel above the edge of traveled way shall be at least 2.1 m (7').
- d) Unless otherwise shown on the plans traffic sign posts shall conform in materials and installation to SDRS drawing M-45 and shall have one post provided for each 0.48 m² (5 ft²) of sign area, or the signs may be installed on existing lighting standards when approved by the Engineer.
- e) Sign panels mounted on temporary traffic sign posts shall conform to the requirements of these special provisions.

206-7.2.6 Temporary Traffic Sign Posts. Posts shall be 10-gage or 12-gage cold-rolled steel perforated tubing used for the support and stabilization of stationary mounted temporary signs. Post size and number of posts shall be as shown on the plans, except that when stationary mounted signs are installed and the type of sign installation is not shown on the plans, post size and the number of posts will be determined by the Engineer. Sign panels for stationary mounted signs shall consist of reflective sheeting applied to a sign substrate.

206-7.2.7 Portable Temporary Traffic Signs. Each portable temporary traffic sign shall consist of a base, standard or framework and a sign panel. The units shall be capable of being delivered to the site of use and placed in immediate operation. Sign panels for portable signs shall conform to the requirements of these special provisions, or shall be cotton drill fabric, flexible industrial nylon fabric, or other approved fabric. Fabric signs shall not be used during the hours of darkness. Size, color, and legend requirements for portable signs shall be as described for stationary mounted sign panels in section 206-7.2 of these special provisions. The height to the bottom of the sign panel above the edge of traveled way shall be at least 0.3-m (12"). All parts of the sign standard or framework shall be finished with 2 applications of orange enamel which will match the color of the sign panel background. Testing of paint will not be required.



SECTION 207 – GRAVITY PIPE

Add the following section:

207-26 UNDERGROUND UTILITY MARKING TAPE.

Add the following section:

207-26.1 Detectable Underground Utility Marking Tape: Detectable Underground Utility Marking Tape shall have a minimum 0.13 mm (0.005") overall thickness, with no less than a 35 gauge (AWG), 0.14 mm aluminum foil core. The foil must be visible from both sides. The layers shall be laminated together with the extrusion lamination process, not adhesives. No inks or printing shall extend to the edges of the tape. All printing shall be encased to avoid ink rub-off. Detectable Underground Utility Marking Tape shall conform to the properties listed in Tables 207-25(A) and 207-25 (B).

**TABLE 207-26.1(A)
DETECTABLE UNDERGROUND UTILITY MARKING TAPE PROPERTIES**

Property	Method	Value
Thickness	ASTM D2103	0114 mm (0.0056")
Tensile strength	ASTM D882	4500g/cm (25 lbs/inch) (5,500 PSI)
Elongation	ASTM D882-88	<50 percent at break
Printability	ASTM D2578	>50 dynes/square centimeter
Flexibility	ASTM D671-81	Pliable hand
Inks	Manufacturing specifications	Heat-set Mylex
Message repeat	Manufacturing specifications	Every 500 mm(20")
Foil	Manufacturing specifications	Dead soft/annealed
Top layer	Manufacturing specifications	Virgin PET
Bottom layer	Manufacturing specifications	Virgin LDPE
Adhesives	Manufacturing specifications	>30 percent, solid 1.5#/R
Bond strength	Boiling H ₂ O at 100 degrees Celsius	Five hours without peel
Colors	APWA Code	See Table 207-25.1 (B)

**TABLE 207-26.1(B)
DETECTABLE UNDERGROUND UTILITY MARKING TAPE COLORS**

Color	Utility Marked
Red	Electric power, distribution, transmission, and municipal electric systems.
Yellow	Gas and oil distribution and transmission, dangerous materials, product and steam.
Orange	Telephone and telegraph systems, police and fire communications, and cable television.
Blue	Water systems.
Green	Sanitary and storm sewer systems, nonpotable.
Brown	Force mains.
Purple	Reclaimed water lines.

Add the following section:

207-26.2 Materials Approvals. Detectable Underground Utility Marking Tape shall meet the requirements of each of the following agency/association publications:



- a) Department of Transportation, Materials Transportation Bureau, Office of Pipeline Safety. USAS code for pressure piping B31.8, paragraph 192.321(e).
- b) National Transportation Safety Board, Washington, DC, Special Study Prevention of Damage to Pipelines. Adopted June 7, 1974. Report NTSB-PSS-73-1.
- c) American Petroleum Institute (API). Recommended practice for marking buried liquid petroleum pipelines - API RP 1109.
- d) General Services Administration, Washington, DC, Public Buildings Service Guide Specification for Mechanical and Electrical Equipment - PBS 4-1501, Amendment 2, Page 501-14, Paragraph 18, Subparagraph 18.1, Clause 18.1.1.
- e) Rural Electrification Authority (REA), U.S. Department of Agriculture, Washington, DC, National Electrical Safety Code for Underground Construction for remote and immediate hazards.



**SUPPLEMENTAL PROVISIONS
TO
STANDARD SPECIFICATIONS FOR PUBLIC WORKS
CONSTRUCTION
PART 3, CONSTRUCTION METHODS
SECTION 300 - EARTHWORK**

NOTE: Soil Report. *The recommendations within the project's soil report (Geotechnical Evaluation, Calavera Hills Community Park, Carlsbad, California, prepared by Ninyo and Moore dated February 13, 2015 Project No. 107544007) shall be incorporated into these specifications. In the event of a conflict between the geotechnical report and these specifications and the project plans, immediately consult the project's Civil Engineer. To prepare an accurate bid, it is suggested that bidders and their geotechnical consultant perform an independent evaluation of the subsurface conditions in the project areas. The independent evaluations may include, but not be limited to, review of other geotechnical reports prepared for the adjacent areas, site reconnaissance, and additional exploration and laboratory testing.*

300-1 CLEARING AND GRUBBING.

300-1.1 General. Add the following to the third paragraph: During surface clearing operations, the Contractor shall not cover or bury any plant growth or other objectionable materials. If the Contractor cannot successfully separate the plant growth from the surface soil and advertently or inadvertently mixes organic or other objectionable materials with the soil, the soil so contaminated shall be removed from the site by the Contractor. All costs, if any, associated with removing the soil mixed with organic or other objectionable materials and importing soil to replace said contaminated soil shall be borne by the Contractor and no additional payment therefore shall be made to the Contractor.

Clearing and grubbing shall also include the relocation, adjusting or salvaging of all facilities so indicated on the Plans which are not designated as separate bid items or which are not included in other bid items.

Unless otherwise noted on Plans, the Contractor shall protect all existing sewer, water, electric, telephone, communication, television, fire lines, street lights, traffic signal, red light cameras, irrigation, and other utilities, services and systems, whether shown on the Plans or not. The Contractor shall maintain all services in working condition during the course of the Work. The Contractor shall remove all existing abandoned pipelines and conduits of any type or use, and pipelines and conduits of any type or use that are abandoned during the course of the Work and shall replace said pipelines and conduits with properly compacted soils. The Contractor shall immediately restore to full operation any utilities, services or systems that are disturbed during the course of the Work.

Add the following:

300-1.1.1 Removal and Disposal of Materials: Also included in clearing and grubbing shall be removal and disposal of existing fences, asphalt concrete and aggregate base, concrete curb and gutter, concrete sidewalk, existing gate, and other existing features which interfere with the work.



Whether or not such items are shown on the plans they shall be removed as a part of clearing and grubbing. Existing underground pipes and conduits that are shown on the plans and designated to be removed shall be removed by the Contractor as a part of clearing and grubbing.

300-1.4 Payment. Modify as follows: Payment for clearing and grubbing shall be made at the contract lump sum price for clearing and grubbing within the project limits and at stockpile locations and no other payments will be made. Unless otherwise noted on plans, the Contractor shall remove all existing abandoned pipelines and conduits of any type, or use, and pipelines and conduits of any type, or use, that are abandoned during the course of the work and shall replace said pipelines and conduits with properly compacted soils. Payment for removal and disposal of abandoned utilities shall be included in the lump-sum bid for Clearing and Grubbing, and no additional payment will be made.

300-2 UNCLASSIFIED EXCAVATION.

300-2.1 General. Add the following: Unclassified excavation shall include removal and stockpile of suitable material, recompaction, mixing, grading for mitigation work, trenching and backfilling of storm drains, sewers, other utilities, disposal of unsuitable materials not included in the bid item for clearing and grubbing, all cut and fill including salvaging clean excavated material and filling areas to the required grades and cross section. Suitable excavated material may be utilized onsite to make all fills shown on the plans. Unclassified excavation shall also include scarification and moisture adjustment and compaction of the top 300 mm (1') of the subgrade in the roadway prism in cut areas to 95 percent relative compaction, and export of remaining excess material to a disposal site or spoil area acquired by the Contractor.

300-2.2 UNSUITABLE MATERIAL

Revise this subsection to read as follows:

300-2.2.1 General. All excess material generated by the grading operations that is not suitable for backfill shall be excavated and disposed of by the Contractor at a legal disposal site. The Agency makes no claim on the suitability or moisture content of the existing materials. Any suitable local borrow materials at the site that the Contractor wishes to re-use shall be stockpiled by the Contractor. The location of stockpiles shall be approved by the Engineer prior to placement of materials, and all stockpiles shall be protected by erosion control measures.

All subgrade areas to receive fills or structures shall be inspected by the Geotechnical Engineer. All alluvial and colluvial soils, loose or poorly compacted soils, or existing dry material must be reworked before the placement of base or concrete can proceed. Areas where soils are loose or poorly compacted shall be reworked by excavating, blending and recompacting the loose soils to the specified compaction. The existing loose soils to be reworked shall be removed by the Contractor until a firm unyielding surface is exposed or to a depth determined by the Engineer. Dry materials shall be scarified, and moisture conditioned to achieve the specified compaction. With the approval of the Geotechnical Engineer, the Contractor may choose to stabilize poorly-compacted areas with geogrid at his own expense.

If the Contractor wishes to temporarily stockpile material for disposal at a later date the location of stockpiles shall be approved by the Engineer prior to placement of materials, and all stockpiles shall be protected by storm water pollution prevention and erosion control measures. The stockpiles shall be removed regularly from the Project site so as not to interfere with access to the Project.



If the excavated material is unsatisfactory as excavated for other uses in the Project, as determined by the Engineer, the Contractor shall remove and dispose of such excavated material off the site. The Contractor shall be responsible for obtaining a suitable legal disposal site for any unsuitable excavated materials in accordance with the appropriate section in the Standard Specifications.

300-2.5 Slopes. Add the following: The hinge points (the top and bottom) of slopes shall be located within 75 mm (0.25') of the locations shown on the plans.

300-2.5 Slopes. Add the following: after the first sentence of the first paragraph: A slope shall be defined as any area steeper than three horizontal to one vertical.

300-2.6 Surplus Material. Add the following: The Contractor shall haul and dispose of all surplus material from the project. The Contractor shall utilize highway legal haul trucks for this export of material from the project site and to a site secured by the Contractor. No earth moving equipment or special construction equipment, as defined in section 565 of the California Vehicle Code, will be allowed for hauling material on public streets.

300-2.7 Selected Material. Revise this subsection to read as follows: 300-2.7 Selected Material. Selected material encountered in excavation shall be used as directed by the Agency. Topsoil excavated within the limits of the Project may be considered as a selected material only for the purpose of backfilling areas to be planted.

300-2.8 Measurement. Delete the second paragraph relating to materials removed from stockpiles and add the following:

Unclassified Excavation shall be measured based on the volume it occupies in its original position before excavating. The measurement shall be from the original ground contours after clearing and grubbing and the bottom of areas of excavation to the design elevations shown on the plans or actual ground contours existing in borrow sites after excavation, whichever is lower in elevation. No excavated material which is re-excavated will be measured for payment. No allowance for shrinkage or swell will be considered. Materials excavated or otherwise removed as all or part of any other bid item shall not be measured as Unclassified Excavation.

300-2.9 Payment. Delete and replace with the following: Payment for all unclassified excavation will be made at the Contract Lump Sum price bid for Grading and shall include compensation for excavation, sloping, rounding tops and ends of excavation, matching existing graded slopes, loading, exporting and disposing of surplus material and unsuitable material shown on the plans or specified herein to be removed, stockpiling, hauling to designated sites, placing and compacting, mixing, grading of mitigation site, salvaging clean and suitable material and filling areas to the required grades and cross sections. Unclassified fill, slope rounding, all work incidental to Section 300-4.8 and construction of transitions will be paid for as a part of Grading, and no additional payment will be made therefore.

When required by the plans or specifications or where directed by the Engineer, the excavation and stockpiling of selected material will be paid for at the Contract Lump Sum price for unclassified excavation. Removing such selected material from the stockpile and placing it in its final position will also be paid for at the Contract Lump Sum Price for unclassified excavation and no additional compensation will be allowed therefore.



Add the following section:

300-2.10 Grading Tolerance. The Contractor shall finish excavated areas other than slopes and subgrade below structures, within the roadway and sidewalk areas within 30 mm (0.1') of the grades shown on the plans. Subgrade tolerances shall conform to the requirements of section 301-1.4 SSPWC.

300-3 STRUCTURE EXCAVATION AND BACKFILL

300-3.1 General. Add the following: The Contractor shall excavate to the lines and levels required and/or shown on the Drawings. The Contractor shall provide all shoring, bracing, cribbing, pumping, and planking required. The Contractor shall excavate and maintain the bottom of all trenches in a condition that is level, firm, clean and free from all debris or foreign matter. Excavations shall be kept free from water at all times. The Contractor shall remove any unsuitable material encountered below grade as directed by the Engineer.

300-3.6 Payment. Add the following: No change will be made in the amount to be paid for supporting the excavation for structures as a result of required revisions in the excavation support details due to a type of soil encountered which requires a method of trench support different from that approved.

300-4 UNCLASSIFIED FILL

300-4.2 Preparation of Fill Areas. Add the following: Except as provided in section 300-4.7, "Compaction", areas proposed for improvements all fill (including backfill and scarified ground surfaces) shall be compacted by the Contractor to no less than 90 percent of maximum dry density as determined in accordance with ASTM Test Procedure D1557-91.

300-4.5 Placing Materials for Fills. Add the following: The Contractor shall perform grading such that the upper 900 mm (3') of fill placed in the roadway pavement area is composed of properly compacted low expansive soils. The more highly expansive soils shall be placed in the deeper fill areas and properly compacted or exported from the site. Low expansive soils are defined as those soils that have an Expansion Index of 50 or less when tested in accordance with 1994 UBC Standard 18-2 as published by the International Conference of Building Officials. Should insufficient soils meeting the requirement of an expansion index of 50 or less be present within the limits of work, soils of the least expansion index that are available within the limits of work shall be incorporated in the upper 900 mm (3') of fill placed in the roadway.

The Contractor shall break rock encountered in the excavation into particles of less than 75 mm (3"). Particles with dimensions greater than 75 mm (3") shall be uniformly distributed over the area to be filled so that construction equipment can be operated in such a manner that the larger pieces will be broken into smaller particles and become incorporated with the other materials in the layer. This requirement for particle size reduction does not apply to cobbles, small boulders, and small hard rocks found within the surface soils and formational materials. Rocks having any dimension greater than 460mm (18") shall not be incorporated into the fill. Rock exceeding 150 mm (6") in diameter shall not be placed in the upper 900 mm (3') of any fill. When there are large quantities of rock to be placed in the fill, rocks shall not be nested, but shall be spread with sufficient room between them so that intervening voids can be adequately filled with fine material to form a dense, compact mass. Oversize material which cannot be utilized for erosion mitigation or landscaping onsite shall be broken to acceptable sizes or removed from the site by the Contractor. If disposed of within the City of Carlsbad, a separate grading permit will be required for disposal of rock.



300-4.6 Application of Water. Add the following: The Contractor shall place all fill soil at a moisture content no less than one (1) percent below optimum moisture as determined by ASTM test D-1557-91.

300-4.7 Compaction.

Add the following:

The Contractor shall compact all fill soils placed within the top 1 m (3') of roadway subgrade to a minimum of 95 percent relative compaction. On all areas to receive planting, the top 150 mm (6") shall be compacted to 85%, +2% -5%, to allow for plant growth.

300-4.8 Slopes. Add the following: Feathering of fill over the tops of slopes will not be permitted. The Contractor shall compact the faces of fill slopes with a sheep's foot roller at vertical intervals no greater than 600 mm (2') or shall be built and cut back to finish grade. In addition, if not over built and cut back, the face of the slope shall be track walked upon completion.

300-4.9 Measurement and Payment. Delete and substitute the following: Unclassified fill, grading, shaping, compacting or consolidating, slope rounding, construction of transitions and all work included in and incidental to Section 300-4, "Unclassified Fill" will be paid for as a part of Grading, and no additional payment will be made therefore.

300-5 BORROW EXCAVATION.

Add the following paragraph to this subsection:

300-5.2 Imported Borrow. In accordance with the provisions of Section 20676 of the State of California Public Contract Code, it shall be mandatory upon the Contractor to whom the Contract is awarded, and upon all subcontractors and suppliers under him, to obtain all construction aggregate, sand, gravel, crushed stone, road base, fill materials, and any other mineral materials used for Imported Borrow, from a supplier that is included on the most current Office of Mine Reclamation AB 3098 List (as proposed in California Assembly Bill 3098 and now codified in Section 2717.(b) of the State of California Public Resources Code). Failure to identify the supplier and the mine may result in rejection of the submittal, and any work completed using materials from an unlisted mine will be SUBJECT TO REJECTION.

300-9 GEOTEXTILES FOR EROSION CONTROL.

Modify as follows: **300-9 GEOTEXTILES FOR EROSION CONTROL AND WATER POLLUTION CONTROL.**

Add the following section:

300-9.2 General. The Contractor shall provide erosion control and water pollution control conforming to the requirements shown on the plans, as specified herein, and as elsewhere required by the Contract Documents. Erosion control and water pollution control shall include the work specified herein, and such additional measures, as may be directed by the Engineer, to meet Best Management Practices, as defined herein, and to properly control erosion and storm water damage of the limits of work and construction impacts upon areas receiving drainage flows from within the limits of work.



Add the following section:

300-9.2.1 Grading Controls. The Contractor shall protect all areas that have been graded and/or cleared and grubbed as well as areas that have not been graded and/or cleared and grubbed within the limits of work from erosion. The Contractor shall provide temporary earth berms, gravel bags, silt fences, stabilized construction entrances and similar measures, coordinated with its construction procedures, as necessary and as shown on the plans to control on site and off-site erosion during the construction period. The Contractor will be required to protect areas which have been cleared and grubbed prior to excavation or embankment operations, and which are subject to runoff during the duration of the contract. The criteria used to determine the appropriate erosion control measures shall be the "Best Management Practices", hereinafter BMP, defined and described in the, "Stormwater Best Management Practices Handbook, Construction", most recent edition as published by the California Stormwater Quality Association. The Contractor shall maintain a copy of the "Stormwater Best Management Practices Handbook, Construction", most recent edition on the project site and shall conduct its operations in conformity to said Handbook.

Temporary erosion control measures provided by the Contractor shall include, but not be limited to, the following:

1. Embankment areas, while being brought up to grade and during periods of completion prior to final roadbed construction, shall be graded so as to direct runoff into impoundment areas within the limits of work where such runoff shall have pollutants removed by BMP methods.
2. The Contractor shall provide protection by BMP measures to eliminate erosion and the siltation of downstream facilities and adjacent areas. These measures shall include, but shall not be limited to: temporary down drains, either in the form of pipes or paved ditches with protected outfall berms; graded berms around areas to eliminate erosion of embankment slopes by surface runoff; confined ponding areas to desilt runoff; and to desilt runoff.
3. Excavation areas, while being brought to grade, shall be protected from erosion and the resulting siltation of downstream facilities and adjacent areas by the use of BMP measures. These measures shall include, but shall not be limited to, methods shown on the plans and described herein.

Add the following section:

300-9.2.2 Payment. Full compensation for performing erosion control and water pollution control, conforming to the operational requirements herein, of the BMP and conforming to the requirements of the Federal Water Pollution Control Act, including the latest amendments thereto, which is not a part of the planned permanent work or included as a separate bid item shall be considered as included in the contract lump sum price bid for BMPs and Erosion Control, and no additional compensation will be allowed therefore.

300-13 STORM WATER POLLUTION PREVENTION PLAN

Add the following section:

300-13.1 Storm Water Pollution Prevention Plan. As part of the storm water pollution prevention work, the Contractor shall prepare and submit Storm Water Pollution Prevention Plan, hereafter referred to as the "SWPPP,". The SWPPP shall conform to the requirements of the "Greenbook" Standard Specifications for Public Works Construction, the requirements in the California Storm Water Quality Association, Stormwater Best Management Practice Handbook, Construction ("Handbook"), the requirements of the Permit, the requirements in the plans and these supplemental provisions.



300-13.1.1 SWPPP Document

Within 15 calendar days after the execution of the contract, the Contractor shall submit 3 copies of the SWPPP to the Engineer, in accordance with Section 2-5.3.3 of these Special Provisions. Contractor will be provided the digital format for SWPPP to complete required sections. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the SWPPP within 15 days of receipt of the Engineer's comments and shall allow 5 days for the Engineer to review the revisions. Upon the Engineer's acceptance of the SWPPP, 3 additional copies of the SWPPP, incorporating the required changes, shall be submitted to the Engineer. In order to allow construction activities to proceed, the Engineer may conditionally approve the SWPPP while minor revisions are being completed.

The objectives of the SWPPP shall be to identify pollution sources that may adversely affect the quality of storm water discharges associated with the project and to identify, construct, implement and maintain storm water pollution prevention measures, hereafter referred to as control measures, to reduce to the extent feasible pollutants in storm water discharges from the construction site both during and after construction is completed under this contract.

The SWPPP shall incorporate control measures in the following categories:

1. Soil stabilization practices;
2. Sediment control practices;
3. Wind erosion control practices; and
4. Non-storm water management and waste management and disposal control practices.

Specific objectives and minimum requirements for each category of control measures are contained in the Handbook.

The Contractor shall designate a Water Pollution Control Manager who will have the responsibilities outlined in the SWPPP.

The SWPPP shall include, but not be limited to, the following items as described in the SWPPP:

1. Source Identification;
2. Erosion and Sediment Controls;
3. Non-Storm Water Management;
4. Waste Management and Disposal;
5. Maintenance, Inspection and Repair;
6. Training;
7. List of Contractors and Subcontractors;
8. Post-Construction Storm Water Management;
9. Preparer;
10. Copy of the local permit;
11. BMP Consideration Checklist;
12. SWPPP Checklist;
13. Schedule of Values; and
14. Storm Water Pollution Prevention Drawings.

The Contractor shall amend the SWPPP, graphically and in narrative form, whenever there is a change in construction activities or operations which may affect the discharge of significant quantities of pollutants to surface waters, ground waters, municipal storm drain systems, or when deemed necessary by the Engineer. The SWPPP shall also be amended if it is in violation of any



condition of the Permit or has not effectively achieved the objective of reducing pollutants in storm water discharges. Amendments shall show additional control measures or revised operations, including those in areas not shown in the initially accepted SWPPP, which are required on the project to control water pollution effectively. Amendments to the SWPPP shall be submitted for review and acceptance by the Engineer in the same manner specified for the initially accepted SWPPP. Accepted amendments shall be dated and logged in the SWPPP. Upon acceptance of the amendment, the Contractor shall implement the additional control measures or revised operations.

The Contractor shall keep a copy of the accepted SWPPP and accepted amendments at the project site. The SWPPP shall be made available upon request of a representative of the Regional Water Quality Control Board, State Water Resources Control Board, U.S. Environmental Protection Agency or local storm water management agency. Requests by the public shall be directed to the Engineer.

By June 15 of each year, the Contractor shall submit an annual certification to the Engineer stating compliance with the requirements governing the Permit. If the project is in non-compliance at any time, the Contractor shall make a written report to the Engineer within 15 days of identification of non-compliance.

Add the following section:

300-13.1.3 Payment. Preparation, implementation and management of SWPPP shall be considered incidental to the items of work and no additional payment will be made therefore.

Add the following section:

300-13.1.4 SWPPP Implementation. Upon acceptance of the SWPPP, the Contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting and maintaining the control measures included in the SWPPP and any amendments thereto and for removing and disposing of temporary control measures. Unless otherwise directed by the Engineer or specified in these supplemental provisions, the Contractor's responsibility for SWPPP implementation shall continue throughout any temporary suspension of work ordered in accordance with Section 6-3, "Suspension of Work". Requirements for installation, construction, inspection, maintenance, removal and disposal of control measures are specified in the "Handbook" and these supplemental provisions.

Soil stabilization practices and sediment control measures, including minimum requirements, shall be provided throughout the winter season, defined as between October 1 and April 30.

Implementation of soil stabilization practices and sediment control measures for soil-disturbed areas of the project site shall be completed, except as provided for below, no later than 20 days prior to the beginning of the winter season or upon start of applicable construction activities for projects which begin either during or within 20 days of the winter season.

The Contractor shall implement, year-round and throughout the duration of the project, control measures included in the SWPPP for sediment tracking, wind erosion, non-storm water management and waste management and disposal.

The Engineer may order the suspension of construction operations, at the Contractor's cost, which create water pollution if the Contractor fails to conform to the requirements of this section as determined by the Engineer.



Add the following section:

300-13.1.5 Maintenance. To ensure the proper implementation and functioning of control measures, the Contractor shall regularly inspect and maintain the construction site for the control measures identified in the SWPPP. The Contractor shall identify corrective actions and time frames to address any damaged measures or reinitiate any measures that have been discontinued.

The construction site inspection checklist provided in the "Handbook" shall be used to ensure that the necessary measures are being properly implemented, and to ensure that the control measures are functioning adequately. The Contractor shall submit one copy of each site inspection record to the Engineer, within two days of the inspection.

During the rainy season, inspections of the construction site shall be conducted by the Contractor to identify deficient measures, as follows:

1. When the five-day rain probability forecast exceeds forty percent (40%).
2. After any precipitation which causes runoff capable of carrying sediment from the construction site;
3. At 24 hour intervals during extended precipitation events; and
4. Routinely, at a minimum of once every week.

If the Contractor or the Engineer identifies a deficiency in the deployment or functioning of an identified control measure, the deficiency shall be corrected by the Contractor immediately, or by a later date and time if requested by the Contractor and accepted by the Engineer in writing, but not later than the onset of subsequent precipitation events. The correction of deficiencies shall be at no additional cost to the City.

SECTION 301 - TREATED SOIL, SUBGRADE PREPARATION AND PLACEMENT OF BASE MATERIALS

301-1 SUBGRADE PREPARATION.

301-1.2 Preparation of Subgrade. Modify the second and third paragraphs as follows: Change each instance reading "150mm (6 inches)" to "300 mm (12)".

301-1.3 Relative Compaction. Delete the first paragraph and substitute the following: The Contractor shall compact the upper 300 mm (12") of subgrade beneath areas to be paved, have base or subbase material placed on them, or curb, gutter, curb and gutter, alley pavement, driveway or sidewalk constructed over them to no less than 95 percent maximum dry density as determined by ASTM test D-1557-91.

301-1.7 Payment. Modify the first paragraph as follows: Payment for subgrade preparation shall be included in the contract bid price for which the subgrade is prepared and shall include all labor, materials; including water, operations and equipment to scarify, adjust moisture, compact or recompact the subgrade, both in cut areas and in fill areas, and no further compensation will be allowed.

Add the following section:

301-6 LANDSCAPE BOULDERS.



301-6.1 General. Install landscape boulders per the detail shown on the plans. The Contractor shall separate the boulders into the approximate sizes shown on the plans to ensure the proportions and sizes are met prior to placement. Boulder locations shall be approved by the City and Landscape Architect prior to placement.

301-6.2 Payment. Payment for furnishing and installing the Landscape Boulders will be made at the contract lump sum price and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work and no additional compensation will be allowed.

SECTION 303 CONCRETE AND MASONRY CONSTRUCTION.

303-7 COLORED CONCRETE.

303-7.1 General. Revise the first sentence to read as follows:

303-7.1 General. Colored concrete shall be as indicated in the plan set, project specifications (section **303-9.5**) and on the Bid Schedule.

Add the following sections:

303-9 INTEGRAL COLORED AND EXPOSED AGGREGATE CONCRETE.

303-9.1 Test Panel. Contractor shall supply and prepare and maintain on site a 4' wide x 4' long x 4" thick square completed test section for **EACH** paving type/finish shown on the plans using integral color and/or exposed aggregate. The test application shall be sufficiently complete for inspection by the City and project Landscape Architect for approval prior to commencement of construction. Notify the City seven days in advance of dates and times when mockups will be constructed and ready for review. Approved test samples shall be retained on site and protected from damage for duration of project. Samples will be demolished and removed by the Contractor when directed by the City.

303-9.2 Preparation and Application. Prior to application of retarders, protect all curbs, borders, adjacent paving, etc. that are not intended to receive retarded finish. Use Protector Face Off by Grace Construction Products or approved equal.

Where exposed aggregate is specified on the plans, immediately hand-seed the aggregate right after initial bull float. Uniformly distribute a single layer of the aggregate into the surface. Tamp seeded aggregate into plastic concrete and float with wood Darby's and bull floats to entirely embed aggregate with mortar cover of 1/16 inch. Avoid overworking the surface, as this may work the aggregate into the concrete too deep.

Do not delay the application of the surface retarder beyond the loss of the initial bleed water especially in warmer temperatures for best results.

Apply Retarders with a low-pressure sprayer, at a rate of 250-350 sq.ft./gal, per manufacturer's requirements. Pigmented/colored retarder shall be applied to visually show an even and complete coverage.

Once dry (approximately 1-2 hours), the retarder requires no additional covering and shall function as protection against intermittent rain or hot, windy conditions.



303-9.3 Finishing. Wash with water rinse/light broom or pressure wash with power equipment within 6 – 24 hours after the retarder is applied. Retarder removal intervals depend on strength of mix, exposed aggregate size, and desired washing techniques. Earlier washing for light etch finishes may be necessary. Verify in test panels.

Walks shall be constructed in strict conformance with ADA standards. The cross slope on walks shall in no case exceed two percent (2.00%). The clear width of walk shall not be less than what is indicated on the plan set. Construction tolerances shall not be a reason to exceed the minimum or maximum standards of the ADA.

Any irrigation facilities constructed adjacent to a walk way shall be installed so that the irrigation system is fully functional. Unless there is a bid item for landscaping and irrigation, payment for this work will be considered as included with other items of work.

303-9.4 Concrete Placement.

303-9.4.1 Curing and Protection. Immediately following placement, concrete shall be protected from premature drying, hot and cold temperatures, rain, flowing water and mechanical injury. Final curing shall continue for not less than seven days. Approved methods include; ponding, continuously wet mats, and liquid membrane curing compounds.

Upon completion of the curing period, but not before 7 days has elapsed since pouring the concrete, remove all concrete spills, overflows, and debris.

303-9.5 Measurement and Payment.

303-9.5.1 Colored Concrete Pavement with Exposed Aggregate Finish. Payment for furnishing and installing the Colored Concrete Pavement with Exposed Aggregate Finish will be paid for at the contract **Lump Sum** price and shall include excavation, backfill, subgrade preparation, forms, joints, finishes, curing, and as shown in plans and construction details and shall include all other incidentals, labor, materials, equipment, and doing all work. No additional compensation shall be included.

The color and finish of Colored Concrete Pavement with Exposed Aggregate Finish shall be in the locations as shown on the plans.

- Davis 'Cocoa Brown' integral color, or approved equal, with exposed aggregate to match the existing pavement at the entrance to the community center.

303-9.5.2 Colored Concrete Pavement. Payment for furnishing and installing the Colored Concrete Pavement will be paid for at the contract **Lump Sum** price and shall include excavation, backfill, subgrade preparation, forms, joints, finishes, curing, and as shown in plans and construction details and shall include all other incidentals, labor, materials, equipment, and doing all work. No additional compensation shall be included.

The color and finish of Colored Concrete Pavement shall be in the locations as shown on the plans.

- Davis 'Cocoa Brown' integral color with a medium broom finish or approved equal.
- Davis 'Kailua' integral color with a medium broom finish, or approved equal.



- Davis 'Kailua' integral color with concrete surface retarder No. 5 by Grace (888-977- 9600) or approved equal.

Concrete may be cured by moisture curing, moisture retaining cover curing, curing compound or a combination of these methods.

SECTION 306 - OPEN TRENCH CONDUIT CONSTRUCTION

306-1 OPEN TRENCH OPERATIONS

306-1.2.1 Bedding. All installation of, and bedding for recycled water, or potable water mains shall conform to Carlsbad Municipal Water District Rules and Regulations for the Construction of (Potable or Reclaimed) Water Mains, latest edition.

306-1.3.1 General. Add the following: The Contractor shall install detectable underground utility marking tape 230 mm x75 mm (9" x 3") above each or, in the case of bundled underground conduit of the same type, the upper underground conduit being installed by the open trench method. The type and color of detectable underground utility marking tape shall conform to the requirements of section 207-25 et seq.

306-1.3.4 Compaction Requirements. Delete Section 306-1.3.4 and replace with the following: The Contractor shall densify trench backfill to a minimum of 90 percent relative compaction except that in the top 300 mm (12") of the street right-of-way, compaction shall be 95 percent.



**CALAVERA HILLS
COMMUNITY PARK
GATEWAY IMPROVEMENTS**

**TECHNICAL PROVISIONS
CSI FORMATTED PROJECT SPECIFICATIONS**

TECHNICAL PROVISIONS

DIVISION 00

00 26 00 PRE-BID SUBSTITUTION PROCEDURES

DIVISION 01 – GENERAL REQUIREMENTS

01 10 00 SUMMARY
01 25 00 SUBSTITUTION PROCEDURES
01 31 00 PROJECT MANAGEMENT AND COORDINATION
01 33 00 SUBMITTAL PROCEDURES
01 40 00 QUALITY REQUIREMENTS
01 50 00 TEMPORARY FACILITIES & CONTROLS
01 56 39 TEMPORARY TREE AND PLANT PROTECTION
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DIVISION 03 – CONCRETE

03 30 00 CAST-IN-PLACE CONCRETE
03 30 53 MISCELLANEOUS CAST-IN-PLACE CONCRETE
03 45 00 PRECAST ARCHITECTURAL CONCRETE

DIVISION 04 - MASONRY

04 73 00 MANUFACTURED MASONRY VENEER

DIVISION 09- FINISHES

09 96 23 ANTI-GRAFFITI COATING

DIVISION 11 - EQUIPMENT

11 68 00 EXERCISE EQUIPMENT

DIVISION 12 - SITE FURNISHINGS

12 93 00 SITE FURNISHINGS

DIVISION 13 - SPECIAL CONSTRUCTION

13 31 23 PRE-ENGINEERED FABRIC SHADE STRUCTURES

DIVISION 26 - ELECTRICAL

26 05 19 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26 05 26 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
26 05 33 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS
26 05 53 IDENTIFICATION FOR ELECTRICAL SYSTEMS
26 27 26 WIRING DEVICES
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DIVISION 31 - EARTHWORK

31 10 00 SITE CLEARING
31 20 00 EARTH WORK

DIVISION 32 - EXTERIOR IMPROVEMENTS

32 13 13	SITE CONCRETE WORK
32 13 73	CONCRETE PAVING JOINT SEALANTS
32 18 16.13	PLAYGROUND PROTECTIVE SURFACING
32 84 00	PLANTING IRRIGATION
32 91 13	SOIL PREPARATION
32 92 00	TURF AND GRASSES
32 93 00	PLANTS

DIVISION 33 - UTILITIES

33 10 00	WATER UTILITIES
33 40 00	STORM DRAINAGE UTILITIES

SECTION 00 26 00 - PRE-BID SUBSTITUTION PROCEDURES**PART 1 - GENERAL****1.1 DEFINITIONS**

- A. Pre-Bid Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Contract Documents, submitted prior to receipt of bids.

1.2 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.3 PRE-BID SUBSTITUTIONS

General: By submitting a bid, the Bidder represents that its bid is based on materials and equipment described in the Contract Documents, including Addenda. Bidders may request approval of qualifying substitute materials and equipment for designated items listed in the Instructions to Bidders when the Specifications Sections list materials and equipment by product or manufacturer name.

Pre-Bid Substitution Requests will be received and considered by Owner when the following conditions are satisfied, as determined by Landscape Architect or Civil Engineer; otherwise requests will be returned without action:

1. Extensive revisions to the Contract Documents are not required.
2. Proposed changes are in keeping with the general intent of the Contract Documents, including the level of quality of the Work represented by the requirements therein.
3. The request is fully documented and properly submitted.

1.4 SUBMITTALS

- A. Pre-Bid Substitution Request: Submit to Contract Administrator as directed in Instructions to Bidders. Pre-Bid Substitution Request must be made in writing by Bidder in compliance with the following requirements:
 1. Requests for substitution of materials and equipment will be considered if received no later than 14 calendar days prior to date of bid opening.
 2. Submittal Format: Submit electronic files in Adobe Acrobat PDF format for each written Pre-Bid Substitution Request, using CSI Substitution Request Form 1.5C.

- a. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specifications Sections and drawing numbers.
- b. Provide complete documentation on both the product specified and the proposed substitute, including the following information as appropriate:
 - 1) Point-by-point comparison of specified and proposed substitute product data, fabrication drawings, and installation procedures.
 - 2) Copies of current, independent third-party test data of salient product or system characteristics.
 - 3) Samples where applicable or when requested by Owner.
 - 4) Detailed comparison of significant qualities of the proposed substitute with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - 5) Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - 6) Research reports, where applicable, evidencing compliance with building code in effect for Project from **ICC-ES**.
 - 7) Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Contractor, which will become necessary to accommodate the proposed substitute.
- c. Provide certification by manufacturer that the substitute proposed is equal to or superior to that required by the Contract Documents, and that its in-place performance will be equal to or superior to the product or equipment specified in the application indicated.
- d. Bidder, in submitting the Pre-bid Substitution Request, waives the right to additional payment or an extension of Contract Time because of the failure of the substitute to perform as represented in the Pre-bid Substitution Request.

B. Owner's Action:

Owner may request additional information or documentation necessary for evaluation of the Pre-Bid Substitution Request. Owner will notify all bidders of acceptance of the proposed substitute by means of an Addendum to the Contract Documents.

C. Owner's approval of a substitute during bidding does not relieve Contractor of the responsibility to submit required shop drawings and to comply with all other requirements of the Contract Documents.

END OF SECTION 00 26 00

SECTION 01 10 00 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Project information.
- 2. Work covered by Contract Documents.
- 3. Work required but not shown.
- 4. Governing documents, codes, and standards.
- 5. Conflicts/Clarifications
- 6. Access to site.
- 7. Work restrictions.
- 8. Specification and drawing conventions.

1.3 PROJECT INFORMATION

- A. Project Identification: Calavera Hills Community Park Gateway Improvements.

- 1. Project Location: 2997 Glasgow Dr., Carlsbad, California 92008

- B. Owner:

- 1. City of Carlsbad Parks & Recreation
Department 799 Pine Ave. Suite 200
Carlsbad, CA 92008
- 2. Municipal Project Manager: Valerie Airey (760) 602-2764.

- C. Project Engineer and Landscape Architect:

- 1. Michael Baker International
Joanne Tyler and Jeremy Franzini
5050 Avenida Encinas, Suite 260
Carlsbad, CA 92008
(O) 760-603-6246

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and consists of the following:

1. Expansion and construction of a public park:
 - a. Drainage & Grading
 - b. Concrete Paving
 - c. Exercise Equipment & Rubberized Surfacing
 - d. Shade Structures
 - e. Site Lighting
 - f. Site Furnishings
 - g. Soil Preparation/Finish Grading
 - h. Planting & Irrigation
 - i. Turf areas

- B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.5 WORK REQUIRED BUT NOT SHOWN

- A. The following items not shown on the drawings and/or described in the specifications shall be done by the Contractor and are included in the General Scope of the Work:

1. Contractor shall coordinate locations of all piping, electrical work and other items required to be installed in overhead, wall or room spaces. Carefully study all drawings, and request permission for sleeves, cutouts, etc., wherever required for proper installation and clearances.
2. Provide drawings showing vertical sections through building wherever required to assure that overhead clearances will not be impaired. These requirements shall apply both to subcontracted and assigned work. Impairment of clearances in equipment rooms and similar spaces will not be permitted.
3. Provide coordination drawings, plans and sections as necessary, showing the relationships between the structure and the systems to be installed. Insure routing of the services is coordinated and that the routings are not in conflict with each other.

1.6 GOVERNING DOCUMENTS, CODES, AND STANDARDS

- A. All work shall be done in strict accordance with:

1. The Contract.
2. **GENERAL PROVISIONS of the Contract Documents, Section 2-5.2 –**

Precedence of Contract Documents

1.7 CONFLICTS/CLARIFICATIONS

A. Contract Drawings and Specifications

1. Relationship of Drawings and Specifications:

- a. The Drawings and Specifications taken together are the Contract Documents for this project. In the case of a discrepancy between the two, the more stringent will apply.
- b. The Drawings and Specifications are meant to be supplementary and complementary to each other.
 - 1) That which is shown on the Drawings but not shown in the Specifications shall be provided the same as if shown in both places and to the same standard of quality as for similar items.
 - 2) That which is shown in the Specifications but not shown on the Drawings shall be provided the same as if shown in both places and to the same extent as for similar items.
 - 3) Drawings show extent, location, dimension, relationship among various parts, and quantity of items.
 - 4) Specifications show quality, trade names, generic names and workmanship standards.

2. Specifications:

- a. The Specifications consist of several parts, which are intended to complement each other so that when taken together they provide the complete project requirements.
- b. All parts shown in the Contents together with Addenda, Construction Change Directives, Proposal Requests, Approved Change Orders, Executed Contracts, and Bonds comprise the Contract Documents.
- c. Each Section of the Specification includes all parts of Division 01 - General Requirements, as though written in full within each Section.
- d. Titles and headings to the Divisions and Sections conform to the CSI format and are introduced for convenience and shall not be taken as a complete or correct segregation of the several units of work.
- e. Specifications are of the abbreviated type and include incomplete sentences; all instructions are directed to the Contractor even though such phrases as "the Contractor shall," or "shall be done by the Contractor" have been omitted.
- f. Terms such as "directed," "required," "selected," "permitted," "approved," "acceptable," "satisfactory," and the like mean by the Architect, subject to authorization by the City Engineer, unless otherwise indicated.
- g. Terms such as "shown," "indicated," "detailed," and the like mean upon

the Drawings.

- h. The terms “provide” or “furnish” mean complete and in place, including all peripheral parts, equipment and labor required.
- i. The Scope paragraph, or similar paragraphs that describe the work, in each Section is intended to serve as an index of those items specified within the Section, as a locator for those items which are similar or are interfaces as specified elsewhere, and as a reminder of the inclusion of requirements of Division 01- General Requirement; the index may not be complete; all products, equipment and labor necessary for a complete, safe and operating project are implied if not fully mentioned.

B. Conflicts/Clarifications

- 1. When conflicts occur that the Contractor is aware of in the Drawings (i.e. structural versus architectural) or Drawings and Specifications (i.e. Roof Detail versus Specifications) NONE of the above governs. The Contractor shall notify the City Engineer PRIOR TO PROCEEDING and the City Engineer will determine which way to proceed. IN EITHER CASE, IT WILL BE ASSUMED THE CONTRACTOR BID THE MORE EXPENSIVE METHOD.
- 2. When conflicts occur that are not brought to the City Engineer’s attention, the following shall govern:
 - a. Addenda or modifications of any nature, to the Drawings and Specifications, take precedent over the original.
 - b. In the case of a discrepancy between the Specifications and the Drawings the more stringent requirement will apply.
 - c. Within the Working Drawings, the larger scale takes precedence over smaller and noted materials over graphic indications.

C. See also **GENERAL PROVISIONS** for additional information and requirements.

1.8 ACCESS TO SITE

- A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances

- by construction operations.
- b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.9 WORK RESTRICTIONS

- A. See **GENERAL PROVISIONS** for information and requirements.

1.10 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
- 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 10 00

SECTION 01 25 00 - SUBSTITUTION PROCEDURES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. General Provisions of the Contract Section 1-1.3, EQUALS AND APPROVALS and Section 4-1.6, TRADE NAMES OR EQUALS apply to this section with regard to substitutions made after Notice to Proceed.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.
- B. Action Submittals: Written and graphic information and physical samples that require Landscape Architect's and City Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- C. Informational Submittals: Written and graphic information and physical samples that do not require Landscape Architect's and City Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- D. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

- E. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

- A. 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. All project submittals must be provided to the City within 30 days after issuance of the Notice to Proceed.
 - 2. Substitution Request Form: Use CSI Form 13.1A.
 - 3. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of Landscape Architects and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.

- I. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. 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.
- 4. Landscape Architect's Action: If necessary, Landscape Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Landscape Architect will notify Contractor through City Engineer of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Forms of Acceptance: Change Order, Construction Change Directive, or Landscape Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Landscape Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: **Refer to GENERAL PROVISIONS Section 4-1.6 Trade Names or Equals.**
- B. Substitutions for Convenience: Not allowed.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 25 00

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information (RFIs).
 - 4. Project meetings.
- B. Related Requirements:
 - 1. Section 01 73 00 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 2. Section 01 77 00 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. RFI: Request from Owner, City Engineer, Landscape Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Key Personnel Names: Before starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that 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 to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. 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. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.6 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified. **Refer to GENERAL PROVISIONS Sections 3-3, 3-4, and 3-5.**
 - 1. City Engineer will return RFIs submitted by other entities controlled by Contractor with no response.
 - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 - 1. Project name.

2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Landscape Architect and City Engineer.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 1. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 2. Contractor's signature.
 3. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- B. RFI Forms: uniform transmittal page with substantially the same content as indicated above, acceptable to City Engineer.
1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- C. City Engineer's Action: City Engineer will review each RFI, determine action required, and respond. Allow 20 working days for City Engineer's response for each RFI.
1. City Engineer's action may include a request for additional information, in which case City Engineer's time for response will date from time of receipt of additional information.
 2. City Engineer's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 01 26 00 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify City Engineer per the terms of **GENERAL PROVISIONS Section 3 – Changes in Work**.
- D. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Include the following:
1. Project name.
 2. Name and address of Contractor.

3. Name and address of Landscape Architect and City Engineer.
 4. RFI number including RFIs that were returned without action or withdrawn.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Landscape Architect's and City Engineer's response was received.
- C. On receipt of Landscape Architect's and City Engineer's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Landscape Architect and City Engineer within seven days if Contractor disagrees with response.
1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.7 PROJECT MEETINGS

- A. General: City Engineer will schedule and conduct meetings and conferences at Project site unless otherwise indicated.
1. The Contractor and its representatives shall be prepared to participate in a preconstruction meeting or other project meetings via a virtual platform for video conferencing such as Microsoft Teams, Zoom, or similar.
 2. 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.
 3. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 4. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, City Engineer, and Landscape Architect, within three days of the meeting.
- B. Preconstruction Conference: City Engineer will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Landscape Architect.
1. Contractor shall provide a list of the Contractor's primary staff. Include the name, title, email address, office and cell phone number. The list shall include the primary contact for each of the subcontractors listed in the Contractor's bid. The Contractor shall also provide two 24-hour emergency contacts – primary and back-up.
 2. Attendees: Authorized representatives of Owner, City Engineer,

Landscape Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for RFIs.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.
 - j. Distribution of the Contract Documents.
 - k. Submittal procedures.
 - l. Preparation of record documents.
 - m. Use of the premises.
 - n. Work restrictions.
 - o. Working hours.
 - p. Owner's occupancy requirements.
 - q. Responsibility for temporary facilities and controls.
 - r. Procedures for disruptions and shutdowns.
 - s. Construction waste management and recycling.
 - t. Parking availability.
 - u. Office, work, and storage areas.
 - v. Equipment deliveries and priorities.
 - w. First aid.
 - x. Security.
 - y. Progress cleaning.
 4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction or at the request or direction of the City Engineer.
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, City Engineer 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 RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility requirements.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written instructions.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 5. 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: City Engineer will conduct progress meetings at weekly intervals.
1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner, City Engineer, 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 at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. 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 via a three-week look ahead schedule. 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.
 - 1) Review schedule for next period.
 - 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) Progress cleaning.
 - 10) Quality and work standards.
 - 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of proposal requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) Documentation of information for payment requests.
4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - 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 01 31 00**

SECTION 01 33 00 – SUBMITTAL PROCEDURES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements: (Not Used)

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Landscape Architect's and City Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Landscape Architect's and City Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Landscape Architect and City Engineer and additional time for handling and reviewing submittals

required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Landscape Architect's and City Engineer's final release or approval.
 - g. Scheduled date of fabrication.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Landscape Architect's Digital Data Files: Electronic digital data files (PDF and AutoCAD Format) of the Contract Drawings will be provided by Landscape Architect for Contractor's use in preparing submittals.

1. Landscape Architect will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings.
 - a. The following PDF files will be furnished for each appropriate discipline:
 - 1) Building plans and details.
 - 2) Construction Site plans and details.
 - 3) Grading and drainage plans and details.
 - 4) Electrical plans and details.
 - 5) Landscape and irrigation plans and details.
 - b. The following AutoCAD files will be furnished for each appropriate discipline:
 - 1) Construction Site plans.
 - 2) Grading and drainage plans.

- B. 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. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 3. 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 and City Engineer reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on City Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 20 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. City Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Resubmittal Review: Allow 20 days for review of each resubmittal.
 3. Sequential Review: Where sequential review of submittals by Landscape Architect's consultants, Owner, or other parties is indicated, allow 15 days for initial review of each submittal.
 - a. Structural, plumbing, electrical components, drainage devices.
- D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., CALPark-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., CALPark-061000.01.A).
 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Landscape Architect and City Engineer.

4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner, containing the following information:
 - a. Project name.
 - b. Date.
 - c. Name of City Engineer.
 - d. Name of Contractor.
 - e. Name of firm or entity that prepared submittal.
 - f. Names of subcontractor, manufacturer, and supplier.
 - g. Category and type of submittal.
 - h. Submittal purpose and description.
 - i. Specification Section number and title.
 - j. Specification paragraph number or drawing designation and generic name for each of multiple items.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Related physical samples submitted directly.
 - n. Indication of full or partial submittal.
 - o. Transmittal number, numbered consecutively.
 - p. Submittal and transmittal distribution record.
 - q. Other necessary identification.
 - r. Remarks.
- E. Options: Identify options requiring selection by Landscape Architect.
- F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Landscape Architect and City Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Landscape Architect's and City Engineer's action stamp.
- H. 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.
- I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Landscape Architect's and City Engineer's action stamp.

PART 2 - PRODUCTS**2.1 SUBMITTAL PROCEDURES**

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
1. Submit electronic submittals via email or project management software such as VPM, ProCore, or similar, as PDF electronic files, at the direction of the City Engineer.
 - a. Landscape Architect, through City Engineer, will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 2. Action Submittals: Submit three paper copies of each submittal unless otherwise indicated. Landscape Architect, through City Engineer, will return two copies.
 3. Informational Submittals: Submit two paper copies of each submittal unless otherwise indicated. Landscape Architect and City Engineer will not return copies.
 4. Certificates and Certifications Submittals: Provide a 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.
- 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 published 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 catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.

- b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 - 5. Submit Product Data before or concurrent with Samples.
 - 6. Submit Product Data in the following format:
 - a. PDF electronic file.
- 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: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 - 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 22 by 34 inches.
 - 3. Submit Shop Drawings in the following format:
 - a. PDF electronic file.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
 - 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 - 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - e. Specification paragraph number and generic name of each item.
 - 3. 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.

- a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
4. 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. Number of Samples: Submit two full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Landscape Architect, through City Engineer, will return submittal with options selected.
5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: 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. Number of Samples: Submit three sets of Samples. Landscape Architect and City Engineer will retain two Sample sets; remainder will be returned.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Location within room or space.
 4. Submit product schedule in the following format:

- a. PDF electronic file.
- F. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- G. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- H. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- I. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- J. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- K. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- L. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- M. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. 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.
- N. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- O. Compatibility Test Reports: Submit 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.

- P. Field Test Reports: Submit written reports 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 in the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Landscape Architect and City Engineer.
- 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 ARCHITECT'S AND CITY ENGINEER'S ACTION

- A. Action Submittals: Landscape Architect and City Engineer will review each submittal, make marks to indicate corrections or revisions required, and return it. Landscape Architect and City Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Informational Submittals: Landscape Architect and City Engineer will review each submittal and will not return it or will return it if it does not comply with requirements. Landscape Architect and City Engineer will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Landscape Architect and City Engineer.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may be returned by the Landscape Architect without action.

END OF SECTION 01 33 00

SECTION 01 40 00 - QUALITY REQUIREMENTS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. 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. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Landscape Architect, Owner, City Engineer, or authorities having jurisdiction are not limited by provisions of this Section.
 - 4. Specific test and inspection requirements are not specified in this Section.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Landscape Architect or City Engineer.
- C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

1. Laboratory Mockups: Full-size physical assemblies constructed at testing facility to verify performance characteristics.
 2. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
 3. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting.
- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: 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.
1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

- A. Referenced Standards: 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 conflicting requirements that are different, but apparently equal, to Landscape Architect for a decision before proceeding.

- B. 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
- C. 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.

1.5 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.
- C. Testing Agency Qualifications: 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.
- D. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.
 - 5. Identification of test and inspection methods.
 - 6. Number of tests and inspections required.
 - 7. Time schedule or time span for tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.

1.6 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Landscape Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.

1. Project quality-control manager may also serve as Project superintendent.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
 1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
 2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
 3. Owner-performed tests and inspections indicated in the Contract Documents.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Landscape Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.7 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. 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. Record of temperature and weather 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 reinspecting.

- B. **Manufacturer's Technical Representative's Field Reports:** Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of technical representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- C. **Factory-Authorized Service Representative's Reports:** Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of factory-authorized service representative making report.
 2. Statement that equipment complies with requirements.
 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 4. Statement whether conditions, products, and installation will affect warranty.
 5. Other required items indicated in individual Specification Sections.
- 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.

1.8 QUALITY ASSURANCE

- A. **General:** Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. **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, as well as sufficient production capacity to produce required units.
- C. **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.
- D. **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.

- 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 product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections 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. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. 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.
- J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to

- comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project.
2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Landscape Architect, through City Engineer, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.9 QUALITY CONTROL

- A. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
- 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 - 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 - 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 - 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 - 5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 - 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- B. 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 as specified in Section 01 33 00 "Submittal Procedures."
- C. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with Landscape Architect, City Engineer, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Landscape Architect, City Engineer, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform any duties of Contractor.
- F. 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.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -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.
- H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.

1. Distribution: Distribute schedule to Owner, Landscape Architect, City Engineer, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.10 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified testing agency and/or special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:
 1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
 2. Notifying Landscape Architect, City Engineer, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 3. Submitting a certified written report of each test, inspection, and similar quality-control service to Landscape Architect, through City Engineer, with copy to Contractor and to authorities having jurisdiction.
 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Landscape Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Landscape Architect's and City Engineer's reference during normal working hours.

3.2 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 Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 73 00 "Execution."
- 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 01 40 00

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for work restrictions and limitations on utility interruptions.
 - 2. Section 32 12 16 "Asphalt Paving" for construction and maintenance of asphalt pavement for temporary roads and paved areas.
 - 3. Section 32 13 13 "Concrete Paving" for construction and maintenance of cement concrete pavement for temporary roads and paved areas.

1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Landscape Architect, testing agencies, and authorities having jurisdiction.
- B. Sewer Service: Pay sewer-service use charges for sewer usage by all entities for construction operations.
- C. Water Service: Pay water-service use charges for water used by all entities for construction operations.
- D. Electric Power Service: Pay electric-power-service use charges for electricity used by all entities for construction operations.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities

having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

1.5 QUALITY ASSURANCE

- A. 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.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to 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.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with 1-5/8-inch-OD top rails.
- B. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with 1-5/8-inch-OD top and bottom rails. Provide galvanized-steel bases for supporting posts.
- C. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.

2.2 TEMPORARY FACILITIES

- A. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

- 1. Store combustible materials apart from building.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

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 by progress of the Work.
 - 1. Locate facilities to limit site disturbance as specified in Section 01 10 00 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. 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: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
 - 1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.
- C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- E. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
 - 1. Install temporary electric power service overhead unless otherwise indicated.
- F. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic

conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
2. Install lighting for Project identification sign.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide construction for temporary shops and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
2. Maintain support facilities until city inspector schedules Substantial Completion inspection. Remove before 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 for construction operations. Locate temporary roads and paved areas within construction limits indicated on Drawings.

1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.

C. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.

1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
2. Prepare subgrade and install subbase and base for temporary roads and paved areas.
3. 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 Section 32 12 16 "Asphalt Paving."

D. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

E. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
 2. Remove snow and ice as required to minimize accumulations.
- F. Waste Disposal Facilities: Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."
- G. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 01 73 00 "Execution."
- H. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
1. 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. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
1. Comply with work restrictions specified in Section 01 10 00 "Summary."
- C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to the SWPPP Site Plan.
1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
 2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
 3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
 4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent

flooding by runoff of stormwater from heavy rains.

- E. Tree and Plant Protection: Comply with requirements specified in Section 01 56 39 "Temporary Tree and Plant Protection."
- F. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- G. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.
- H. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
 - 1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
 - 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.
- I. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.
- J. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- K. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- L. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
 - 1. Prohibit smoking in construction areas.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and -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.
 - 4. 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.
- C. Operate Project-identification-sign lighting daily from dusk until 12:00 midnight.
- D. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- E. 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 property of Contractor. Owner reserves right to take possession of Project identification signs.
 - 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
 - 3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION 01 50 00

SECTION 01 56 39 - TEMPORARY TREE AND PLANT PROTECTION**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.
- B. Related Requirements:
 - 1. Section 01 50 00 "Temporary Facilities and Controls" for temporary site fencing.
 - 2. Section 31 10 00 "Site Clearing" for removing existing trees and shrubs.

1.3 DEFINITIONS

- A. Caliper: Diameter of a trunk measured by a diameter tape at a height 6 inches above the ground for trees up to and including 4-inch size at this height and as measured at a height of 12 inches above the ground for trees larger than 4-inch size.
- B. Caliper (DBH): Diameter breast height; diameter of a trunk as measured by a diameter tape at a height 54 inches above the ground line.
- C. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.
- D. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and [indicated on Drawings] [defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated] defined by a circle concentric with each tree with a radius 12 times the tree's caliper size and with a minimum radius of 96 inches unless otherwise indicated.
- E. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to temporary tree and plant protection including, but not limited to, the following:

- a. Tree-service firm's personnel and equipment needed to make progress and avoid delays.
- b. Arborist's responsibilities.
- c. Quality-control program.
- d. Coordination of Work and equipment movement with the locations of protection zones.
- e. Trenching by hand or with air spade within protection zones.
- f. Field quality control.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings:
 1. Include plans, elevations, sections, and locations of protection-zone fencing and signage, showing relation of equipment-movement routes and material storage locations with protection zones.
 2. Detail fabrication and assembly of protection-zone fencing and signage.
 3. Indicate extent of trenching by hand or with air spade within protection zones.
- C. Tree Pruning Schedule: Written schedule detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.
 1. Species and size of tree.
 2. Location on site plan. Include unique identifier for each.
 3. Reason for pruning.
 4. Description of pruning to be performed.
 5. Description of maintenance following pruning.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For arborist and tree service firm.
- B. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.
- C. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.
- D. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.

1. Use sufficiently detailed photographs or video recordings.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

E. Quality-control program.

1.7 QUALITY ASSURANCE

- A. Arborist Qualifications: Certified Arborist as certified by ISA.
- B. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed temporary tree and plant protection work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of the Work.
- C. Quality-Control Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work without damaging trees and plantings. Include dimensioned diagrams for placement of protection zone fencing and signage, the arborist's and tree-service firm's responsibilities, instructions given to workers on the use and care of protection zones, and enforcement of requirements for protection zones.

1.8 FIELD CONDITIONS

- A. The following practices are prohibited within protection zones:
 1. Storage of construction materials, debris, or excavated material.
 2. Moving or 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.
- B. Do not direct vehicle or equipment exhaust toward protection zones.
- C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Backfill Soil: Planting soil of suitable moisture content and granular texture for placing around tree; free of stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.
 - 1. Planting Soil: Planting soil as specified in Section 32 91 15 "Soil Preparation (Performance Specification)."
- B. Organic Mulch: Free from deleterious materials and suitable as a top dressing for trees and shrubs, consisting of one of the following:
 - 1. Type: Ground or shredded bark.
 - 2. Size Range: 3 inches maximum, 1/2 inch minimum.
 - 3. Color: Natural.
- C. Protection-Zone Fencing: Fencing fixed in position and meeting the following requirements:
 - 1. Plastic Protection-Zone Fencing: Plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch maximum opening in pattern and weighing a minimum of 0.4 lb/ft.; remaining flexible from minus 60 to plus 200 deg F; inert to most chemicals and acids; minimum tensile yield strength of 2000 psi and ultimate tensile strength of 2680 psi; secured with plastic bands or galvanized-steel or stainless-steel wire ties; and supported by tubular or T-shape galvanized-steel posts spaced not more than 96 inches apart.
 - a. Height: 48 inches.
 - b. Color: High-visibility orange, nonfading.
- D. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes prepunched and reinforced; legibly printed with nonfading lettering and as follows:
 - 1. Lettering: 3-inch-high minimum, black characters on white background.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- B. Prepare written report, endorsed by arborist, listing conditions detrimental to tree and plant protection.

3.2 PREPARATION

- A. Locate and clearly identify trees, shrubs, and other vegetation to remain. Tie a 1-inch blue vinyl tape around each tree trunk at 54 inches above the ground.
- B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.
- C. Tree-Protection Zones: Mulch areas inside tree-protection zones and other areas indicated. Do not exceed indicated thickness of mulch.
 - 1. Apply 2-inch uniform thickness of organic mulch unless otherwise indicated. Do not place mulch within 6 inches of tree trunks.

3.3 PROTECTION ZONES

- A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones before materials or equipment are brought on the site and construction operations begin in a manner that will prevent people and animals from easily entering protected areas except by entrance gates. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.
 - 1. Chain-Link Fencing: Install to comply with ASTM F 567 and with manufacturer's written instructions.
 - 2. Posts: Set or drive posts into ground one-third the total height of the fence without concrete footings. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to Landscape Architect.
 - 3. Access Gates: Install where necessary; adjust to operate smoothly, easily, and quietly; free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by Landscape Architect. Install one sign spaced approximately every 35 feet on protection-zone fencing, but no fewer than four signs with each facing a different direction.
- C. Maintain protection zones free of weeds and trash.
- D. Maintain protection-zone fencing and signage in good condition as acceptable to Landscape Architect and remove when construction operations are complete and equipment has been removed from the site.

1. Do not remove protection-zone fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
2. Temporary access is permitted subject to preapproval in writing by arborist if a root buffer effective against soil compaction is constructed as directed by arborist. Maintain root buffer so long as access is permitted.

3.4 EXCAVATION

- A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements in Section 31 20 00 "Earth Moving" unless otherwise indicated.
- B. Trenching within Protection Zones: Where utility trenches are required within protection zones, excavate under or around tree roots by hand or with air spade, or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots.
- C. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3 inches back from new construction and as required for root pruning.
- D. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

3.5 ROOT PRUNING

- A. Prune tree roots that are affected by temporary and permanent construction. Prune roots as follows:
 1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
 2. Cut Ends: As directed and recommended by the arborist.
 3. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
 4. Cover exposed roots with burlap and water regularly.
 5. Backfill as soon as possible according to requirements in Section 31 20 00 "Earth Moving."
- B. Root Pruning at Edge of Protection Zone: Prune tree roots 12 inches outside of the protection zone by cleanly cutting all roots to the depth of the required excavation.

- C. Root Pruning within Protection Zone: Clear and excavate by hand or with air spade to the depth of the required excavation to minimize damage to tree root systems. If excavating by hand, use narrow-tine spading forks to comb soil to expose roots. Cleanly cut roots as close to excavation as possible.

3.6 CROWN PRUNING

- A. Prune branches that are affected by temporary and permanent construction. Prune branches as directed by arborist.
 - 1. Prune to remove only injured, broken, dying, or dead branches unless otherwise indicated. Do not prune for shape unless otherwise indicated.
 - 2. Do not remove or reduce living branches to compensate for root loss caused by damaging or cutting root system.
 - 3. Pruning Standards: Prune trees according to ANSI A300 (Part 1).
- B. Unless otherwise directed by arborist and acceptable to Landscape Architect, do not cut tree leaders.
- C. Cut branches with sharp pruning instruments; do not break or chop.
- D. Do not paint or apply sealants to wounds.
- E. Provide subsequent maintenance pruning during Contract period as recommended by arborist.
- F. Chip removed branches and dispose of off-site.

3.7 REGRADING

- A. Lowering Grade within Protection Zone: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by arborist unless otherwise indicated.
 - 1. Root Pruning: Prune tree roots exposed by lowering the grade. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots as required for root pruning.
- B. Minor Fill within Protection Zone: Where existing grade is 2 inches or less below elevation of finish grade, fill with backfill soil. Place backfill soil in a single uncompacted layer and hand grade to required finish elevations.

3.8 FIELD QUALITY CONTROL

- A. Inspections: Engage a qualified arborist to direct plant-protection measures in the

vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

3.9 REPAIR AND REPLACEMENT

- A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or to be relocated that are damaged by construction operations, in a manner approved by Landscape Architect.

1. Submit details of proposed pruning and repairs.
2. Perform repairs of damaged trunks, branches, and roots within 24 hours according to arborist's written instructions.
3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Landscape Architect.

- B. Trees: Remove and replace trees indicated to remain that are more than 25 percent dead or in an unhealthy condition before the end of the corrections period or are damaged during construction operations that Landscape Architect determines are incapable of restoring to normal growth pattern.

1. Small Trees: Provide new trees of same size and species as those being replaced for each tree that measures 6 inches or smaller in caliper size.
2. Large Trees: Provide one new tree(s) of 6-inch caliper size for each tree being replaced that measures more than 6-inches in caliper size.

- a. Species: As selected by Landscape Architect.

3. Plant and maintain new trees as specified in Section 32 93 00 "Plants."

- C. Excess Mulch: Rake mulched area within protection zones, being careful not to injure roots. Rake to loosen and remove mulch that exceeds a 2-inch uniform thickness to remain.

- D. Soil Aeration: Where directed by Landscape Architect, aerate surface soil compacted during construction. Aerate 10 feet beyond drip line and no closer than 36 inches to tree trunk. Drill 2-inch-diameter holes a minimum of 12 inches deep at 24 inches o.c. Backfill holes with an equal mix of augered soil and sand.

3.10 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove excess excavated material, displaced trees, trash, and debris and legally dispose of them off Owner's property.

END OF SECTION 01 56 39

SECTION 01 73 00 - EXECUTION**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of Owner-installed products.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for limits on use of Project site.
 - 2. Section 01 33 00 "Submittal Procedures" for submitting surveys.
 - 3. Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
 - 4. Section 02 41 19 "Selective Demolition" for demolition and removal of selected portions of the building.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 INFORMATIONAL SUBMITTALS

- A. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
 - 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.

2. Products: List products to be used for patching and firms or entities that will perform patching work.
3. Dates: Indicate when cutting and patching will be performed.
4. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.

- a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

- B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.5 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.
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 1. 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 results in increased maintenance or decreased operational life or safety. Operational elements include the following:
 - a. Primary operational systems and equipment.
 - b. Fire-suppression systems.
 - c. Control systems.
 - d. Communication systems.
 - e. Conveying systems.
 - f. Electrical wiring systems.
 - g. Operating systems of special construction.
- C. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.

- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Landscape Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, 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.
- C. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- D. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - 1. Description of the Work.
 - 2. List of detrimental conditions, including substrates.
 - 3. List of unacceptable installation tolerances.
 - 4. Recommended corrections.
- E. 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. 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.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Landscape Architect according to requirements in Section 01 31 00 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Landscape Architect and Construction Manager promptly.
- B. General: Engage a land surveyor or professional engineer to lay out the Work using accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish limits on use of Project site.
 - 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 4. Inform installers of lines and levels to which they must comply.
 - 5. Check the location, level and plumb, of every major element as the Work progresses.
 - 6. Notify Landscape Architect and Construction Manager when deviations from required lines and levels exceed allowable tolerances.
 - 7. 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 lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim 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 and Construction Manager.

3.4 FIELD ENGINEERING

- A. Identification: Contractor shall identify existing benchmarks, control points, and property corners.
- B. 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.
 - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Landscape Architect or Construction Manager. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Landscape Architect and Construction Manager before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two permanent 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.
 - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
 - 1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
 - 2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

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.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.

- 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. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Landscape Architect.
 - 2. Allow for movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. 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.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 CUTTING AND PATCHING

- A. Cutting and Patching, 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 in-place 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. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place 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.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 01 10 00 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.
- G. Cutting: Cut in-place 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 neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete and 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 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.
- H. 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 practicable. Provide materials and comply with installation requirements

specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical 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 minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. 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 waste materials more than seven days during normal weather or three 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.
 - a. Use containers intended for holding waste materials of type to be stored.
 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- 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. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 74 19 "Construction Waste Management and Disposal."
- H. 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.
- I. 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.
- J. 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.

3.8 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00 "Quality Requirements."

3.9 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.

END OF SECTION 01 73 00

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.
- B. Related Requirements:
 - 1. Section 02 41 19 "Selective Demolition" for disposition of waste resulting from partial demolition of buildings, structures, and site improvements, and for disposition of hazardous waste.
 - 2. Section 31 10 00 "Site Clearing" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of 75 percent by weight of total non-hazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials, including the following:

1. Demolition Waste:

- a. Asphalt paving.
- b. Concrete.
- c. Concrete reinforcing steel.
- d. Concrete masonry units.
- e. Electrical conduit.
- f. Copper wiring.
- g. Lighting fixtures.
- h. Lamps.
- i. Ballasts.
- j. Electrical devices.
- k. Switchgear and panelboards.
- l. Transformers.
- m. Wood fence.
- n. Tubular steel fence.
- o. Utility poles

2. Construction Waste:

- a. Masonry and CMU.
- b. Lumber.
- c. Wood sheet materials.
- d. Wood trim.
- e. Metals.
- f. Piping.
- g. Electrical conduit.
- h. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
 - 1) Paper.
 - 2) Cardboard.
 - 3) Boxes.
 - 4) Plastic sheet and film.
 - 5) Polystyrene packaging.
 - 6) Wood crates.
 - 7) Plastic pails.

1.5 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 30 days of date established for the Notice of Award.

1.6 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Use Form CWM-7 for construction waste and Form CWM-8 for demolition waste. Include the following information:
 - 1. Material category.
 - 2. Generation point of waste.
 - 3. Total quantity of waste in tons.
 - 4. Quantity of waste salvaged, both estimated and actual in tons.
 - 5. Quantity of waste recycled, both estimated and actual in tons.
 - 6. Total quantity of waste recovered (salvaged plus recycled) in tons.
 - 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.7 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

PART 2 - PRODUCTS (Not Used)**PART 3 - EXECUTION****3.1 PLAN IMPLEMENTATION**

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - 1. Comply with operation, termination, and removal requirements in Section 01 50 00 "Temporary Facilities and Controls."
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
 - 1. Review locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 - 2. Comply with Section 01 50 00 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
 - 3. Store items in a secure area until installation.
 - 4. Protect items from damage during transport and storage.
 - 5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- B. Salvaged Items for Sale and Donation: Not permitted on Project site.
- C. Salvaged Items for Owner's Use: Salvage items for Owner's use and handle as follows:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers with label

- indicating elements, date of removal, quantity, and location where removed.
- 3. Store items in a secure area until delivery to Owner.
- 4. Transport items to Owner's storage area off-site designated by Owner.
- 5. Protect items from damage during transport and storage.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
 - 1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - 4. Store components off the ground and protect from the weather.
 - 5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING DEMOLITION WASTE

- A. Asphalt Paving: Break up and transport paving to asphalt-recycling facility.
- B. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- C. Metals: Separate metals by type.
 - 1. Structural Steel: Stack members according to size, type of member, and length.
 - 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.

3.5 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
2. Polystyrene Packaging: Separate and bag materials.
3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

3.6 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Burning: Burning of waste materials is permitted only at designated areas on Owner's property, provided required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.

D. Disposal: Remove waste materials and dispose of at designated spoil areas on Owner's property.

E. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION 01 74 19

SECTION 01 77 00 - CLOSEOUT PROCEDURES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- B. Related Requirements:
 - 1. Section 01 73 00 "Execution" for progress cleaning of Project site.
 - 2. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 ACTION SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
 - 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by City Engineer. Label with manufacturer's name and model number where applicable.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Advise Owner of pending insurance changeover requirements.
 - 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 - 3. Complete startup and testing of systems and equipment.
 - 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
 - 6. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 7. Complete final cleaning requirements, including touchup painting.
 - 8. Touch up and otherwise repair and restore marred exposed finishes to

eliminate visual defects.

- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect and City Engineer 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. Reinspection: Request reinspection 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.

1.7 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
1. Certified List of Incomplete Items: 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. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 2. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 3. Submit pest-control final inspection report.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Landscape Architect and City Engineer 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. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization 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. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Landscape Architect and City Engineer.
 - d. Name of Contractor.
 - e. Page number.
3. Submit list of incomplete items in the following format:
 - a. MS Excel electronic file. Landscape Architect, through City Engineer, will return annotated file.
 - b. PDF electronic file. Landscape Architect, through City Engineer, will return annotated file.

1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Landscape Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch 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.
 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- 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.
 - 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Pest Control: Comply with pest control requirements in Section 01 50 00 "Temporary Facilities and Controls." Prepare written report.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Section 01 74 19 "Construction Waste Management and Disposal."

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs and bulbs noticeably dimmed by hours of use.

END OF SECTION 01 77 00

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:

- 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.

- B. Related Requirements:

- 1. Section 01 73 00 "Execution" for certified survey.
 - 2. Section 01 77 00 "Closeout Procedures" for general closeout procedures.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:

- 1. Number of Copies: Submit one set(s) of marked-up record prints.
 - 2. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit PDF electronic files of scanned record prints and one of file prints.
 - 2) Landscape Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit PDF electronic files of scanned record prints and one set(s) of prints.
 - 2) Print each drawing, whether or not changes and additional information were recorded.

- B. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.
- C. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: 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 provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
 - 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Locations and depths of underground utilities.
 - d. Revisions to routing of piping and conduits.
 - e. Revisions to electrical circuitry.
 - f. Actual equipment locations.
 - g. Changes made by Change Order or Construction Change Directive.
 - h. Changes made following Landscape Architect's written orders.
 - i. Details not on the original Contract Drawings.
 - j. Field records for variable and concealed conditions.
 - k. Record information on the Work that is shown only schematically.
 - 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.

4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Landscape Architect and City Engineer. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Annotated PDF electronic file with comment function enabled.
 2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 3. Refer instances of uncertainty to Landscape Architect through City Engineer for resolution.
 4. Landscape Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.
 - a. See Section 01 33 00 "Submittal Procedures" for requirements related to use of Landscape Architect's digital data files.
 - b. Landscape Architect will provide data file layer information. Record markups in separate layers.
- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Format: Annotated PDF electronic file with comment function enabled.
 3. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Landscape Architect and City Engineer.
 - e. Name of Contractor.

2.2 MISCELLANEOUS RECORD SUBMITTALS

- A. 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.

- B. Format: Submit miscellaneous record submittals as PDF electronic file or scanned PDF electronic file(s) of marked-up miscellaneous record submittals.
 - 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Landscape Architect's and City Engineer's reference during normal working hours.

END OF SECTION 01 78 39

SECTION 01 78 40 – WARRANTIES AND BONDS**PART 1 - GENERAL****1.1 SUMMARY**

- A. This Section includes administrative and procedural requirements for warranties required by the Contract Documents, including manufacturers' standard warranties on products and special warranties.
1. Compile specified warranties and bonds.
 2. Compile specified service and maintenance contracts.
 3. Co-execute submittals when so specified.
 4. Review submittals to verify compliance with Contract Documents.
 5. Submit the above to the Owner for review.
 6. Refer to the General Conditions for General Warranty of Construction.
 7. Refer to the General Conditions for terms of the Contractor's period for correction of the Work.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
1. Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.
- C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.2 DESCRIPTION

- A. Work under this Contract shall be warranted by the Contractor against all defects for a minimum of one (1) year from the Date of Substantial Completion of the Work or designated portions thereof or for a minimum of one (1) year after acceptance by the Owner of designated equipment. In case of items remaining uncompleted after Date of Substantial Completion, the one-year warranty period shall run from the date of acceptance of such items. Special warranties applicable to definite parts of the Work and as specifically stipulated in the separate Sections of the Specifications or other Contract Documents shall be subject to the terms of this Paragraph during the first year of the life of such warranty. If repairs or changes are required in connection with the warranted Work within any warranty period, the Contractor shall, promptly upon receipt of notice from the Owner, Landscape Architect or Architect, and without expense to the Owner, comply with the following:
1. Place in satisfactory condition in every particular all of such warranted Work and correct all defects herein.

2. Make good damage to the buildings or site, which is the result of the cause for said repairs and changes.
 3. Make good any Work, including the equipment and contents of said buildings or site, disturbed in fulfilling any such warranty.
- B. The Owner may, at his sole discretion, after the Contractor has received seven (7) days written notice, repair or cause to be repaired special equipment which he has caused to be furnished and installed and which may be damaged and the repair of which is included in the provision of any warranty; however, where special equipment is involved which, because of its inherent nature, may suffer further damage or cause loss to the Owner due to the seven day delay, the Owner may cause such to the seven day delay, the Owner may cause such equipment to be repaired without notice to the Contractor. The cost of such repairs and the reconditioning of the equipment to its exact state prior to damage.
- C. If repairs or changes are required in connection with warranted Work within any warranty period and notice thereof is given within such period, the warranty shall continue as to Work requiring repair or change until the things herein required to be done are completed, and the termination of the warranty period shall not apply thereto.
- D. In case of Work performed by Subcontractors and where special warranties are required, warranties addressed to and in favor of the Owner shall be secured from said Subcontractors.
- E. No provision in the Contract Documents nor in any special or general warranty shall be held to limit, as to time or scope of liability, the Contractor's liability for defects, or the liability of his sureties, to less than the legal limit of liability under laws having jurisdiction.
- F. The Contractor will not be held responsible for defects due to misuse, negligence, willful damage, improper maintenance, or accident caused by others, nor shall he be responsible for parts whose replacement is necessitated by failure of the Owner's maintenance forces to properly clean and service them provided that the Contractor has furnished complete maintenance instructions to the Owner.
- G. Submit warranties to Landscape Architect or Architect for review and transmittal to Owner.
- H. The delivery of any warranties shall not relieve the Contractor from any obligation assumed under any other provision of the Contract Documents.
- I. The obligations of the Contractor, under this Section, shall survive termination of the Contract.
- J. Some work may require warranties for more than one (1) year.

1.3 WARRANTY REQUIREMENTS

- A. **Related Damages and Losses:** When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.
- B. **Reinstatement of Warranty:** When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. **Replacement Cost:** Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.
- D. **Owner's Recourse:** Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.
- E. **Rejection of Warranties:** The Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
- F. **Where the Contract Documents require a special warranty, or similar commitment on the Work or part of the Work, the Owner reserves the right to refuse to accept the Work, until the Contractor presents evidence that entities required to countersign such commitments are willing to do so.**

1.4 SUBMITTALS

- A. **General:**
 - 1. Submit written warranties, bonds, and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors to the Owner.
 - 2. For equipment or component parts of equipment put into service during progress of construction, submit documents within 10 days after inspection and acceptance.
 - 3. For all other items, submit at closeout.

4. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Owner within 10 days of completion of that designated portion of the Work.
 5. For items of work, where acceptance is delayed materially beyond the Date of Substantial Completion, provide update submittal within 10 days after acceptance, listing the date of acceptance as the start of the warranty period.
- B. When the Contract Documents require the Contractor, or the Contractor and a subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner for approval prior to final execution.
1. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Form of Submittal: Compile 2 copies of each required warranty properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
- D. Bind Warranties and Bonds in heavy-duty, commercial-quality, durable 3-ring, vinyl- covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the following:
 - a. Product or work item.
 - b. Firm, with name of principal, address and telephone number.
 - c. Scope.
 - d. Date of beginning of warranty, bond or service and maintenance contract.
 - e. Duration of warranty, bond or service maintenance contract.
 - f. Provide information on proper procedures in case of failure, and instances that might affect the validity of warranty or bond.
 - g. Contractor, name of responsible principal, address and telephone number.
 2. Bind Warranties and Bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8 1/2" by 11" paper. Identify

each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS" for (list product), the Project title or name and name of the Contractor.

3. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.
- E. Special Guarantees are required by various sections of the Specifications. Assemble written Guarantees, label and submit to the Owner's Project Manager for review and transmittal to the Owner.
1. Equipment Guarantees shall be written in the manufacturer's standard form and shall be countersigned by the Subcontractor and Supplier and the Contractor.
 2. All other Guarantees shall be written on the subcontractor's or supplier's letterhead and shall be countersigned by the Contractor.
 3. Bind Guarantees in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8 ½" by 11" paper. Identify each binder on the front and the spine with the typed or printed title "GUARANTEES", the Project title or name and the name of the Contractor.
 4. When operating and maintenance are required for Guaranteed construction, provide additional copies of each Guarantee, as necessary, for inclusion in each required manual.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 WARRANTIES

- A. Submit warranties, bonds, service and maintenance contracts as specified in the respective sections of the Specifications.

3.2 FORM OF WARRANTY

- A. Warranties shall be in the form set forth below and shall be typed on the Contractor's own letterhead. Please see next page.

Following is:

Sample "Warranty For"

WARRANTY FOR _____

We hereby warrant that the _____
that we have installed in the _____
has been done in accord with the Contract Documents and that the Work as
installed will fulfill the requirements of the warranty included in the Specifications.
We agree to repair or replace any or all of our Work together with any other
adjacent Work which may be displaced or damaged by so doing, that may prove to
be defective in its workmanship or materials within a period of _____
_____year(s) from date of
acceptance of the above-named Work, without any expense to the Owner, unusual
abuse or neglect excepted.

In the event of our failure to comply with the foregoing conditions within seven (7)
days after being notified in writing by the Owner, we collectively or separately do
hereby authorize the Owner or its successor in interest to proceed to have said
defects repaired and made good at our expense and we will honor and pay the costs
and charges therefore upon demand.

Signed: _____
(Contractor)
< or >

Signed: _____ (Subcontractor)

Countersigned: _____ (Contractor)

END OF SECTION 01 78 40

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

The requirements of the Standard Specifications for Public Works Construction (SSPWC), latest edition, Parts 2 through 6 (except as modified herein), apply to this project and are incorporated herein by this reference. Part 1 is specifically excluded.

Drawings, project manual, and general provisions of the Contract, including, without limitation, General Conditions of the Contract, additional General Conditions of the Contract, and Division 1 specification sections, apply to this section.

1.2 SCOPE

Work included: Provide all cast-in-place concrete, complete in place, as indicated on the drawings, specified herein, and needed for a complete and proper installation.

1.3 QUALITY ASSURANCEQualifications of Installers:

Throughout the progress of installation of the work of this Section, provide at least one person who shall be thoroughly familiar with the specified requirements, completely trained and experienced in the necessary skills, and who shall be present at the site and shall direct all work performed under this Section.

Use adequate number of skilled workers to ensure installation in strict accordance with the approved design.

PART 2 - MATERIALS**2.1 GENERAL**

All materials shall conform to Section 201 of Standard Specifications.

- A. Portland Cement: Section 201-1.2.1, Type V. Only one brand of cement shall be used.
- B. Aggregates: Conform to Section 201-1.2.2.
- C. Water shall be clean and free from deleterious materials.
- D. Curing compound: "Clear Seal" as manufactured by A.C. Horn, "Burke Cure Seal" as manufactured by Burke Concrete Accessories, Inc.
- E. Form lumber shall be Douglas Fir, construction grade or better.

- F. Expansion joint material: Shall be ASTM Standard D1751-61 "Fibre Expansion Joint" as manufactured by W.R. Meadows, Inc. or approved equivalent.
- G. Joining new concrete adjacent to existing concrete: A single ply of 30 lb. asphalt roofing felt, meeting the guidelines of ASTM D-226, shall be placed along the entire thickness of the exposed vertical slab of existing concrete. Excess asphalt felt shall be removed so that the top edge of the felt is flush with the finished concrete surface after the concrete has cured.

PART 3 - EXECUTION

3.1 GENERAL

All materials shall conform to Section 302.6 of Standard Specifications except as modified herein.

3.2 CONCRETE MIX

- A. The Contractor shall supply and pay all costs for concrete mix designs.
- B. In no case shall concrete contain less than 5 sacks of cement per cubic yard, and a maximum of 7 gallons of water per sack of cement.
- C. Concrete mixes shall be proportioned by the using of 1-inch maximum size aggregate.
- D. All concrete shall conform to Concrete Class Use Table, Section 201- 1.1.2, of the Standard Specifications and shall be 520-C-2500 (2,500 pounds per square inch ultimate compressive strength at 28 days) unless otherwise noted. Concrete mix shall have a maximum water/ cement ratio of 0.61.
- E. The maximum slump for slab on grade shall be 4".
- F. Mix design must be approved by Architect, and/or City's testing laboratory. Three or more mix design reviews will be at Contractor's expense.

3.3 TESTS AND INSPECTION

- A. The quality and quantity of materials used in the concrete shall be controlled at the batch plant by a Weighmaster.
- B. Contractor shall deliver two copies of each load ticket to the City representative.

3.4 FORMWORK

- A. Form shall be substantial, unyielding, true to line and grade, and shall conform to the dimensions indicated on the drawings.
- B. Use form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practical sizes to minimize number of joints.
 - 1. Panels at Smooth Concrete: New, FSC, urea-formaldehyde free, minimum 3/4-inch thick, MDO plywood made specifically for forming of Architectural Concrete to achieve joint pattern shown on Drawings or accepted shop drawings; Acceptable materials: "PureKor MDO Concrete Formply" by Panel Source International, Inc.
- C. Form Release Agent: Colorless non-staining, free from oils. Chemical agent shall not impair bonding of paint or other proposed coatings.

3.5 TRANSPORTATION AND PLACING CONCRETE

Responsibility for proper placing, compacting and finishing rests with the Contractor. Finished work showing voids and separation of aggregates will not be accepted.

3.6 SLAB FINISH

- A. Exterior slabs shall have a finish between light broom and medium broom to match existing adjacent as directed by the Architect. The finish must be true to line and grade.
- B. Concrete walks shall have 1/2" thick expansion joints at all locations indicated on plans, and score joints at all locations indicated on plans, with a maximum interval of 10 feet on-center.
- C. All exterior flatwork shall drain positively away from buildings, whether indicated or not on the drawings.
 - 1. Any condition which may result in water standing or flowing adjacent to buildings shall be brought to the attention of the City representative before placing concrete.
 - 2. Maximum allowable tolerance for level slab shall be a variation of 1/8" from a 10' straight edge.
- D. Graffiti concrete surfaces will not be accepted. The contractor shall provide watchmen as required to insure a graffiti-free surface. Patching of concrete surfaces will not be permitted. Whole sections must be removed and replaced.

3.7 BENCH FINISH

Bench finish: Hard troweled, extra smooth.

3.8 CURING CONCRETE

All concrete surfaces shall be kept continuously wet for a period of not less than 36 hours by ponding, soaking or spraying. Following this 36 hour period, the concrete shall be protected from loss of moisture by Edoco Cure & Seal 30 EF by Dayton Superior or approved equal.

END OF SECTION 03 30 00

SECTION 03 30 53 - MISCELLANEOUS CAST-IN-PLACE CONCRETE**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes cast-in-place concrete footings, including reinforcement, concrete materials, mixture design, placement procedures, and finishes.
- B. Related Requirements:
 - 1. Section 321313 "Concrete Paving".

1.3 ACTION SUBMITTALS

- A. Design Mixtures: For each concrete mixture.

1.4 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.

PART 2 - PRODUCTS**2.1 CONCRETE, GENERAL**

- A. Comply with the following sections of ACI 301 unless modified by requirements in the Contract Documents:
 - 1. "General Requirements."
 - 2. "Formwork and Formwork Accessories."
 - 3. "Reinforcement and Reinforcement Supports."
 - 4. "Concrete Mixtures."
 - 5. "Handling, Placing, and Constructing."
- B. Comply with ACI 117.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

2.3 CONCRETE MATERIALS

- A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- B. Cementitious Materials:
 - 1. Portland Cement: ASTM C 150/C 150M, Type I.
 - 2. Fly Ash: ASTM C 618, Class C or F.
 - 3. Slag Cement: ASTM C 989/C 989M, Grade 100 or 120.
- C. Normal-Weight Aggregate: ASTM C 33/C 33M, 1-1/2-inch nominal maximum aggregate size.
- D. Air-Entraining Admixture: ASTM C 260/C 260M.
- E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 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.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
- F. Water: ASTM C 94/C 94M.

2.4 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth or cotton mats.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

- D. Water: Potable.

2.5 CONCRETE MIXTURES

- A. Comply with ACI 301.
- B. Normal-Weight Concrete:
1. Minimum Compressive Strength: As indicated on the drawings at 28 days.
 2. Maximum W/C Ratio: 0.45.
 3. Slump Limit: 4 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
 4. Air Content: Maintain within range permitted by ACI 301.

2.6 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and furnish batch ticket information.
1. When air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
 2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd.
 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION

- A. Design, construct, erect, brace, and maintain formwork according to ACI 301.

3.2 EMBEDDED ITEM INSTALLATION

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.3 STEEL REINFORCEMENT INSTALLATION

- A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.4 CONCRETE PLACEMENT

- A. Comply with ACI 301 for placing concrete.
- B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
- C. Consolidate concrete with mechanical vibrating equipment according to ACI 301.

3.5 FINISHING UNFORMED SURFACES

- A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on surface.
 - 1. Do not further disturb surfaces before starting finishing operations.
- C. Trowel Finish: Apply a hard trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.

3.6 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with ACI 301 for hot-weather protection during curing.
- B. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- C. Curing Methods: Cure formed and unformed concrete for at least seven days by one or a combination of the following methods:

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 lap over adjacent absorptive covers.
2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.

END OF SECTION 03 30 53

SECTION 03 45 00 - PRECAST ARCHITECTURAL CONCRETE**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Precast concrete picnic tables
 - 2. Precast concrete BBQ
 - 3. Precast concrete trash receptacle
 - 4. Precast concrete recycling receptacle
 - 5. Precast concrete bench
 - 6. Precast concrete bollard
 - 7. Precast concrete removable bollard

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Installation methods

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver architectural precast concrete units in such quantities and at such times to limit unloading units temporarily on the ground or other re-handling.
- B. Support units during shipment on non-staining shock-absorbing material.
- C. Store units with adequate dunnage and bracing and protect units to prevent contact with soil, to prevent staining, and to prevent cracking, distortion, warping or other physical damage.
- D. Place stored units so identification marks are clearly visible, and units can be inspected.
- E. Handle and transport units in a manner that avoids excessive stresses that cause cracking or damage.
- F. Lift and support units only at designated points indicated on Shop Drawings.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. The pre-cast concrete amenities shall be per the models and finishes indicated on the Plans and shall be by Quick Crete (951-737-6240) or approved equal.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine supporting structural frame or foundation and conditions for compliance with requirements for installation tolerances, bearing surface tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove loose material and debris from base surface before placing site furnishings.

3.3 LAYOUT

- A. The Contractor shall mark the locations of all site furnishings and obtain approval from the City prior to installation. Locations may be adjusted to provide minimum clear distances from other obstructions.

3.4 INSTALLATION

- A. Precast concrete picnic tables shall be set in place in the approved locations.
- B. Precast concrete benches shall be bolted in-place per the manufacturers recommendations.
- C. Precast concrete trash and recycling receptacles shall be installed using "Epoxy Mount" method per the manufacturer's instructions.
- D. Precast concrete bollards shall be installed per the manufacturer's recommendations.
- E. Precast concrete removable bollards shall be installed per the manufacturer's recommendations.

3.5 CLEANING

- A. Clean surfaces of precast concrete units exposed to view.

END OF SECTION 03 45 00

SECTION 04 73 00 – MANUFACTURED MASONRY VENEER**PART 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes: Portland cement based manufactured stone veneer and trim.

1.2 REFERENCES

- A. American National Standards Institute (ANSI): 1.
1. ANSI A118.4 – Specifications for Latex-Portland Cement Mortar.
- B. American Society for Testing and Materials (ASTM):
1. ASTM C 39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 2. ASTM C 67 – Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
 3. ASTM C 144 – Standard Specification for Aggregate for Masonry Mortar.
 4. ASTM C 177 – Standard Test Method for Steady-State Head Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
 5. ASTM C 207 – Standard Specification for Hydrated Lime for Masonry Purposes.
 6. ASTM C 270 – Standard Specification for Mortar for Unit Masonry.
 7. ASTM C 482 – Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement.
 8. ASTM C 567 – Standard Test Method for Determining Density of Structural Lightweight Concrete.
 9. ASTM C 847 – Standard Specification for Metal Lath.
 10. ASTM C 932 – Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering.
 11. ASTM C 979 – Standard Specification for Pigments for Integrally Colored Concrete.
 12. ASTM C 1032 – Standard Specification for Woven Wire Plaster Base.
 13. ASTM C 1059 – Standard Specification for Latex Agents for Bonding Fresh To Hardened Concrete.

14. ASTM D 226 – Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
15. ASTM C1063 – Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster
16. ASTM C1329 – Standard specification for Portland cement
17. ASTM C578 – Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
18. ASTM C1289 – Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
19. ASTM E2556/E2556M – Standard Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment

1.3 SUBMITTALS

- A. Reference Section 01 33 00-Submittal Procedures; submit following items:
 1. Product Data.
 2. Samples:
 - a. Standard sample board consisting of small-scale pieces of veneer units showing full range of textures and colors.
 - b. Full range of mortar colors.
 3. Verification Samples: Following initial sample selection submit “laid-up” sample board using the selected stone and mortar materials and showing the full range of colors expected in the finished Work; minimum sample size: 3 by 3 feet.
 4. Quality Assurance/Control Submittals:
 - a. Qualifications:
 - i. Proof of manufacturer qualifications.
 - ii. Proof of installer qualifications.
 - b. Regulatory Requirements: Evaluation reports.
 - c. Veneer manufacturer’s installation instructions.
 - d. Installation instructions for other materials.
- B. Closeout Submittals:

1. Maintenance Instructions.
2. Special Warranties.

1.4 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer Qualifications: Eldorado Stone, LLC or approved equal.
2. Installer Qualifications: Experienced mason familiar with installation procedures and related local, state and federal codes masonry.

B. Certifications:

1. ICC Evaluation Service - Evaluation Report ESR-1215
2. ICC ESR-1215, Florida Building Code Supplement
3. ASTM C1670
4. LARR – Research Report RR25589
5. HUD - Material Release Number 910F
6. UL - Classification listing in Building Materials Directory: UL 546T (F8002)

C. Field Sample:

1. Prepare 4 by 4 foot sample. Use approved selection sample materials and colors. Include corners and mortar.
2. Obtain Landscape Architect's approval.
3. Protect and retain sample as a basis for approval of completed manufactured stone work. Approved sample may be incorporated into completed work.

1.5 DELIVERY, STORAGE, AND HANDLING.

- ##### A. Follow manufacturer's instructions.

1.6 PROJECT/SITE CONDITIONS

- ##### A. Environmental Requirements: When air temperature is 40 degrees F (4.5 degrees C) or below, consult local building code for Cold-Weather Construction requirements.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard warranty coverage against defects in materials when installed in accordance with manufacturer's installation instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Eldorado Stone, LLC (800) 925-1491 1370 or approved equal.
- B. Product: Veneer types as shown on Drawings, including corner pieces.
- C. Veneer Unit properties: Precast veneer units consisting of Portland cement, lightweight aggregates, and mineral oxide pigments.
 - 1. Compressive Strength: ASTM C 192 and ASTM C 39, 5 sample average: greater than 1,800 psi (12.4MPa).
 - 2. Shear Bond: ASTM C 482: 50 psi (345kPa), minimum.
 - 3. Freeze-Thaw Test: ASTM C 67: Less than 3 percent weight loss and no disintegration.
 - 4. Thermal Resistance: ASTM C 177: 0.473 at 1.387 inches thick
 - 5. Weight per square foot: 2012 IBC and 2012 IRC, ASTM C1670, 15 pounds, saturated.
- D. Mortar:
 - 1. Cement: Portland cement complying with ASTM C 1329.
 - 2. Lime: ASTM C 207.
 - 3. Sand: ASTM C 144, natural or manufactured sand.
 - 4. Color Pigment: ASTM C 979, mineral oxide pigments.
 - 5. Water: Potable.
 - 6. Pre-Packaged Latex-Portland Cement Mortar: ANSI A118.4.
- E. Bonding Agent: Exterior integral bonding agent meeting [ASTM C 932] [ASTM C 1059 Type II]

2.2 MORTAR MIXES

- A. Standard Installation (Grouted Joints):
 - 1. Mix mortar in accordance with ASTM C 270.

2. Polymer modified mortar complying with ANSI A118.4
 - a. Add color pigment in grout joint mortar in accordance with pigment manufacturer's instructions not to exceed 10% by weight of cement.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates upon which work will be installed.
- B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.
- C. Commencement of work by installer is acceptance of substrate.

3.2 PREPARATION

- A. Protection: Protect adjacent work from contact with mortar.
- B. Surface Preparation: Prepare substrate in accordance with manufacturer's installation instructions for the type of substrate being covered.

3.3 INSTALLATION

- A. Install and clean stone in accordance with manufacturer's installation instructions for Standard Installation (Grouted Joint) Cs specified above.

3.4 CLEANING

- A. Remove protective coverings from adjacent work.
- B. Cleaning Veneer Units:
 1. Wash with soft bristle brush and water/granulated detergent solution
 2. Rinse immediately with clean water
- C. Removing Efflorescence:
 1. Allow veneer to dry thoroughly
 2. Scrub with soft bristle brush and clean water
 3. Rinse immediately with clean water; allow to dry
 4. If efflorescence is still visible, contact manufacturer Customer Service for assistance

END OF SECTION 04 73 00

SECTION 09 96 23 – ANTI-GRAFFITI COATING**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications Sections, apply to this section.

1.2 SUMMARY

- A. This section includes surface preparation and field application of graffiti-resistant coating systems to the vertical sides and bench seating of precast concrete picnic tables (table top surface not included), vertical stone sides of the serving counters (counter top surface not included), precast concrete trash receptacles, precast concrete recycle receptacles, precast concrete BBQ, precast concrete park bench, precast concrete permanent bollard, precast concrete removable bollard, and the seat wall with stone veneer.

1.3 SUBMITTALS

- A. Product Data: For each coating system indicated. Include block fillers and primers.
 - 1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference the specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
 - 2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each material specified.
 - 3. Material Safety Data Sheet (MSDS). Environmental installation requirements and safety precautions shall be adhered to.
- B. Certification: Certification by manufacturer that products supplied comply with requirements indicated that limit the amount of VOCs in coating products.
- C. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate.
- D. Qualification Data: For Firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owner, and other information specified.

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: Engage Manufacturer to provide an applicator who has completed anti-graffiti coating system applications similar in material and extent to those indicated for Project, and whose work has a record of successful in-service performance.
- B. Source Limitations: Obtain base coatings, top coatings, and removal agent from the same manufacturer.

1.5 PERFORMANCE REQUIREMENTS

- A. Provide anti-graffiti coating system complying with the following:
 - 1. Permanent coating system. Coatings shall not require re application regardless of number of graffiti taggings during the life of the 5-year performance warranty period.
 - 2. Show no signs of deterioration or change of appearance after graffiti removal during the warranty period. No ghosting, staining, or shadowing.
 - 3. Capability of removing 100% of all types of paint and graffiti materials from treated surfaces without damaging the coating or the substrate.
 - 4. Upon graffiti removal, no evidence of graffiti shall remain.
 - 5. Capable of withstanding a minimum of 120 cleaning cycles over the same area without measurable coating deterioration.
 - 6. Shall not increase dirt pick-up of substrate.
 - 7. Meet the following test results for the following chemicals:
 - 8. MEK: No effect after 5 days
 - 9. Carboxylic Acid: No effect after 5 days
 - 10. 75% Phosphoric Acid: No effect after 5 days
 - 11. 37% HCL: 3 hours blister
 - 12. 50% Sulfuric Acid: No effect after 5 days
 - 13. 20% NIT: 68 hours blister
- B. Time Tested
 - 1. System specified must have been in successful commercial use for at least 12 years and have had a continuous City of Los Angeles Research Report number in good standing and compliance since 1991.

2. Provide documentation of performance of the anti-graffiti coating system by written report from a nationally recognized and certified Protective Coating Specialist. Such documentation shall include; type of substrate, location, length of service, testing performed and results.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label with the following information:
 1. Name or title of material.
 2. Product description (generic classification or binder type).
 3. Manufacturer's stock number and date of manufacture.
 4. Contents by volume, for pigment and vehicle constituents.
 5. Thinning instructions.
 6. Application instructions.
 7. Color name and number.
 8. Handling instructions and precautions.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain containers used in storage in a clean condition, free of foreign materials and residue.
 1. Keep storage area neat and orderly.
 2. Remove oily rags and waste daily.
 3. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and applying coatings.

1.7 PROJECT CONDITIONS

- A. Apply coatings only when temperature of surfaces to be coated and surrounding air temperatures are between 40 and 100 deg F.
- B. Do not apply coatings in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
 1. Allow wet surfaces to dry thoroughly and attain temperature and conditions specified before proceeding with or continuing coating operation.

1.8 EXTRA MATERIALS

- A. Furnish extra graffiti-resistant coating to the Owner in quantities described below. Package coating material in new, unopened, factory-sealed containers for storage and identify with labels describing contents.
 - 1. Quantity: Two gallons (two 1-gallon containers).
- B. Furnish extra graffiti removal materials to the Owner in quantities described below. Package coating material in new, unopened, factory-sealed containers for storage and identify with labels describing contents.
 - 1. Quantity: One case (twelve 16-ounce bottles).

1.9 WARRANTY

- A. System Performance Warranty: Provide 5-year written warranty signed by manufacturer that exhibits defects in materials or workmanship. Defects are defined to include failure to withstand complete graffiti removal, ghosting, shadowing, chemical staining, yellowing, and normal environmental effects.
 - 1. A third party that is authorized by manufacturer must inspect project.
 - 2. Warranty period: 5 years from date of completion.

PART 2 - PRODUCTS

2.1 GRAFFITI-RESISTANT COATING

- A. Approved Products:
 - 1. "Permashield Premium Graffiti Control" with 10-year warranty, as manufactured by Monopole Corporation, 1-818-500-8585l.
 - 2. Or approved equal.

2.2 GRAFFITI-RESISTANT COATING MATERIALS

- A. VOC Classification: Provide materials that comply with the South Coast Air Quality Management District's VOC classification.
- B. Coatings: Coatings shall meet requirements of the following:
 - 1. ASTM B 117 and ASTM D 714 (salt spray minimum acceptable of 8000 hours).
 - 2. ASTM D 530 (hardness)
 - 3. ASTM D 412 (tensile strength and elongation)
 - 4. ASTM D 522 (pass 3/8 inch mandral)

5. ASTM 968 (abrasion test)
 6. ASTM E 96 (vapor transmission)
 7. Water clear, non-yellowing, free of waxes and urethanes.
 8. Non-toxic, non-flammable, biodegradable, with a pH range of 7.0 – 8.5.
 9. Shall allow moisture vapor transmission.
- C. Undercoating Base: Graffiti Solution System GSS-10 Undercoating - Clear VU High Solids Base Coating (AP307); a water-based high-performance undercoating used as sealer over porous surfaces (provide high-solids version for use over porous or uneven surfaces), ND One Coat, or approved equal.
- D. Top Coatings: Graffiti Solution System GSS-10 permanent anti-graffiti top coating, ND Graffiti Shield, or approved equal.
- E. Finish: Matte (Matte is defined as the finish of the top coating reading less than five degrees on a Gardner Gloss Meter).
- F. Color: Color clear.

2.3 GRAFFITI CLEANER

- A. Product shall be non-flammable, biodegradable, with a pH range of 7.0 - 8.5 and recyclable, allowing graffiti removal without the use of blasting equipment, hot water, or high pressure wash equipment.
- B. Approved Products:
1. "GSS ERASOL" as manufactured by American Polymer Corporation, Sandy, Utah 800-676-5963, (800) 676-5963.
 2. "DISAPPEAR Organic Graffiti / Adhesive Remover" as manufactured by New Dimensions Solutions, LLC, 2151 Irving Street, Suite 202, San Francisco, CA 94122, (800) 731-2231.
 3. Or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to bid, with Applicator present, a job "walk through" examining substrates and conditions under which anti-graffiti coatings will be applied for compliance with coating application requirements is essential. Surface / substrates will vary and must be taken into account.
1. Apply coatings only after unsatisfactory conditions have been corrected and surfaces to receive coatings are thoroughly dry.

2. Start of application is construed as Applicator's acceptance of surfaces within that particular area.
- B. Coordination of Work: Review other sections in which primers or other coatings are provided to ensure compatibility of total systems for various substrates. On request, furnish information on characteristics of specified finish materials to ensure compatible primers.
1. If a potential incompatibility of primers applied by others exists, obtain the following from the primer Applicator before proceeding.
 - a. Confirmation of the primer's suitability for expected service conditions.
 - b. Confirmation of primer's ability to be top coated with materials specified.
 2. Notify Landscape Architect about anticipated problems before using the coatings specified over substrates primed by others.

3.2 PREPARATION

- A. General: Remove plates, machined surfaces, and similar items already in place that are not to be coated. If removal is impractical or impossible because of the size or weight of item, provide surface-applied protection before surface preparation and coating.
1. After completing coating operation, reinstall items that were removed; use workers skilled in the trades involved.
- B. Cleaning: Before applying coatings, clean substrates of substances that could impair bond of coatings. Remove oil and grease before cleaning.
1. Schedule cleaning and coating application so dust and other contaminants from cleaning process will not fall on wet, newly coated surfaces.
- C. Surface preparation: Clean and prepare surfaces to be coated according to manufacturers written instructions for each substrate condition and as specified.
1. Provide barrier coats over incompatible primers or remove primers and reprime substrate.
 2. Cementitious Substrates: Prepare concrete, brick, concrete masonry block, and cement plaster surfaces to be coated. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods to prepare surfaces.
 - a. Do not coat surfaces if moisture content exceeds that permitted in manufacturer's written instructions.

3. Metal Substrates: Clean ferrous-metal surfaces that have been shop coated; remove oil, grease, dirt and other foreign substances.
- D. Material Preparation: Carefully mix and prepare coating materials according to the manufacturers written instructions.
 1. Maintain containers used in mixing and applying coatings in a clean condition, free of foreign materials and residue.
 2. Stir materials before applying to produce a mixture of uniform density. Stir as required during application.

3.3 APPLICATION

- A. Apply coatings according to manufacturer's written instructions.
 1. Use applicators and techniques best suited for the material being applied.
 - a. Do not apply coatings over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to forming a durable coating film.
 - b. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until coating has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat does not cause undercoat to lift or lose adhesion.
- B. Application Over Cementitious Surfaces:
 1. All natural surfaces to include concrete, all masonry units, brick tile and block should be treated with a siloxane penetrating water sealer.
 2. Undercoating Base: Minimum of 2 coats equaling 3 to 4 mils minimum dry film thickness [or as many as necessary to achieve a pinhole free surface] of GSS Barrier undercoating as specified by manufacturer.
 3. Top Coatings: Minimum of 2 coats of top coating; 3 to 4 mils minimum dry film thickness [or as many coats as necessary to satisfy warranty requirements]. Surfaces will vary and the objective is to have the coating work on all substrates, the number of coats could vary as well.
- C. Application Over Primed Metal Surfaces:
 1. Finish: 2 coats of top coating; 3 to 4 mils minimum dry film thickness.
- D. Completed Work: Match approved Samples for color, texture, and coverage. Remove, refinish, or recoat work that does not comply with specified requirements.

3.4 FIELD QUALITY CONTROL

- A. Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when coatings are being applied:
 - 1. Owner will engage the services of a qualified testing agency to sample coating material being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
 - 2. Testing agency will perform appropriate tests for the following characteristics as required by Owner:
 - a. Quantitative materials analysis.
 - b. Absorption
 - c. Accelerated weathering.
 - d. Accelerated yellowness.
 - e. Alkali and mildew resistance.
 - f. Abrasion resistance.
 - g. Washability.
- B. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with specified requirements. Contractor shall remove noncomplying coating materials from Project site, pay for testing, and recoat surfaces coated with rejected materials. If necessary, Contractor may be required to remove rejected materials from previously coated surfaces if, on recoating with specified materials, the two coatings are not compatible.
- C. Demonstration: Apply alkyd-based graffiti to a 2 ft. sq. treated area selected by the Architect and Landscape Architect. 5 days minimum after application, demonstrate complete removal of the graffiti in the presence of the Architect and Landscape Architect.

3.5 CLEANING

- A. Cleanup: At the end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
 - 1. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

3.6 PROTECTION

- A. Protect work of other trades, whether being coated or not, against damage from coating operation. Correct damage by cleaning, repairing, replacing, and

recoating, as approved by Architect and Landscape Architect, and leave in an undamaged condition.

1. Provide "Wet Paint" signs to protect newly coated finishes. After completing coating operations, remove temporary protective wrappings provided by others to protect their work.
2. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

END OF SECTION 09 96 23

SECTION 11 68 00 – EXERCISE EQUIPMENT**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project Site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of exercise equipment.
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Include fall heights and use zones for exercise equipment, coordinated with the critical-height values of protective surfacing specified in Section 321816.13 "Playground Protective Surfacing."
- C. Samples for Initial Selection: For each type of exposed finish.
 - 1. Manufacturer's color charts.
 - 2. Include Samples of accessories involving color selection.
- D. Samples for Verification: For each type of exposed finish on the following products:
 - 1. Include Samples of accessories to verify color and finish selection.
 - 2. Posts and Rails: Minimum 6 inches long.
 - 3. Platforms: Minimum 6 inches square.
 - 4. Molded Plastic: Minimum 3 inches square.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installer, manufacturer, and testing agency.
- B. Product Certificates: For each type of exercise equipment.
- C. Material Certificates: For the following items:
 - 1. Shop finishes.

D. Field quality-control reports.

E. Manufacturer warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For exercise equipment and finishes to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Manufacturer's Qualifications: A firm whose exercise equipment components have been certified by IPEMA's third-party product certification service.

B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer with a minimum of six project installations of similar size and complexity.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of exercise equipment that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures.

b. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

B. Warranty Period: Ten years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Shall be Landscape Structures or approved equal, distributed by Coast Recreation, Mike Eisert (714-619-0100).

2.2 FREESTANDING EXERCISE EQUIPMENT

1. As indicated on Plans.

2.3 MATERIALS

A. As indicated on the manufacturer's submittal drawing.

2.4 FINISHES

A. ProShield or approved equal with specific colors selected by Owner prior to ordering.

2.5 CAST-IN-PLACE CONCRETE

- A. Concrete Materials and Properties: ACI 301 for normal-weight with minimum 28-day compressive strength of 3000 psi, 3-inch slump, and 1-inch maximum-size aggregate.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for earthwork, subgrade elevations, surface and subgrade drainage, and other conditions affecting performance of the Work.
 - 1. Do not begin installation before final grading required for placing exercise equipment and protective surfacing is completed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written installation instructions for each equipment type unless more stringent requirements are indicated. Anchor exercise equipment securely, positioned at locations and elevations indicated.
 - 1. Maximum Equipment Height: Coordinate installed fall heights of equipment with finished elevations and critical-height values of protective surfacing. Set equipment so fall heights and elevation requirements for age group use and accessibility are within required limits. Verify that exercise equipment elevations comply with requirements for each type and component of equipment.
- B. Post and Footing Excavation: Excavate holes for posts and footings as indicated in firm, undisturbed or compacted subgrade soil.
- C. Post Set with Concrete Footing: Comply with Section 033053 "Miscellaneous Cast-in-Place Concrete" ACI 301 for measuring, batching, mixing, transporting, forming, and placing concrete.
 - 1. Set equipment posts in concrete footing. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at the correct angle, alignment, height, and spacing.
 - a. Place concrete around posts and vibrate or tamp for consolidation. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.
 - 2. Embedded Items: Follow equipment manufacturer's written instructions and drawings to ensure correct installation of anchorages for equipment.

3. Finishing Footings: Smooth top, and shape to shed water.

3.3 FIELD QUALITY CONTROL

- A. The Contractor shall be responsible to provide a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
 1. The Contractor shall be responsible for providing an audit of the fitness area, surfacing, and all fitness equipment. The audit shall be conducted by a National Recreation Park Association / National Playground Safety Institute (NRPA / NPSI) Certified Playground Safety Inspector. The audit shall confirm compliance of the fitness area, surfacing, and all fitness equipment with the most current versions of accessibility and safety standards including, but not limited to, the following: Americans with Disabilities Act (ADA), Consumer Product Safety Commission's (CPSC) Handbook for Public Playground Safety, and the ASTM Standard Consumer Safety Performance Specification for Playground Equipment for Public Use (F-1487), Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment (F-1292), and Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment (F-1951). The audit shall also test for the actual g-max ratings accomplished with various surface materials.
 2. The Contractor shall be responsible for correcting any items found not to be in compliance with the above standards as a result of the audit. The Contractor shall provide to the City of Carlsbad, written certification, signed by the Certified Playground Safety Inspector, stating that the exercise area, surfacing, and equipment comply with all current applicable accessibility and safety standards, only after all items, if any, have been corrected. The letter shall include an itemized list corresponding to each audit item, describing all corrections and the date each correction was completed
 3. The following firm shall be utilized for the services of a Certified Playground Safety Inspector: Playground Service Company, P.O. Box 176, Dana Point, CA 92629, (800-767-3268), or approved equal
- B. Exercise equipment items will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.
- D. Notify the City 48 hours in advance of date(s) and time(s) of testing and inspection.

END OF SECTION 11 68 00

SECTION 12 93 00 - SITE FURNISHINGS**PART 1 – GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Drinking Fountain
 - 2. Bike Rack

1.3 ACTION SUBMITTALS

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

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For site furnishings to include in maintenance manuals.

1.5 BIKE RACK

- A. Quality Assurance
 - 1. Installer Qualifications: An experienced installer who has completed installation of bicycle racks similar in material, design, and extent to that indicated for this project and whose work has resulted in construction with a record of successful in-service performance.
 - 2. Manufacturer Qualifications: A firm experienced in manufacturing bicycle racks similar to those required for this project and with a record of successful in-service performance.
 - 3. Source Limitations: Obtain each color, finish, shape and type of bicycle rack from a single source with resources to provide components of consistent quality in appearance and physical properties.
 - 4. Product Options: Drawings indicate size, shape and dimensional requirements of bicycle racks and are based on the specific system indicated.
- B. Submittals
 - 1. Product Data: Include physical characteristics such as shape, dimensions, bicycle, material parking capacity and finish for each bicycle rack.

2. Shop Drawings: Show installation details for each bicycle rack.
 3. Samples for Verification: Submit finish samples for review and verification.
 4. Maintenance Data: For each bicycle rack.
 - a. Include recommended methods for repairing damage to the finish.
- C. Warranty
1. Bicycle racks shall carry a one-year manufacturer's limited warranty against defects in materials and workmanship. The one-year warranty period begins the date the product is shipped from the manufacturer.

PART 2 - PRODUCTS

2.1 DRINKING FOUNTAIN

- A. Drinking Fountain Construction:
1. Modular outdoor, barrier-free, pedestal bottle filler and drinking fountain shall include a 3/16" galvanized-steel pedestal with silver powder-coating, one bottle filling station and two drinking fountains, push-button operated stainless steel valves with front-accessible cartridge and flow adjustment, polished chrome-plated brass vandal-resistant shielded bubbler heads, large-opening bottle filler with quick-fill 1 gpm flow rate, 100% lead-free waterways, polished chrome-plated vandal-resistant waste strainers with top-down clean-out access on fountains, vandal-resistant access plates, integral mounting feet, and 1-1/2" slip waste.
- B. Manufacturer and Model: Haws Model 3612-01 with 3660-01, Modular Outdoor Bottle Filler and Double Drinking Fountain with Lockable Hose Bib Faucet (888-640-4297) model with stainless steel surface carrier or approved equal.

2.2 BICYCLE RACKS

- A. Acceptable Manufacturers
1. Provide bicycle racks manufactured by DERO BIKE RACK CO., 42 Northern Stacks Drive, Suite 100, Minneapolis, MN 55421, 1-888-337-6729, website: www.dero.com or approved equal.
- B. Materials
1. 2" schedule 40 uncoated pipe.
 2. Installation Methods: In-ground mount embedded into concrete base.
- C. Finishes
1. A TGIC powdercoat finish. Color to be selected by City.

2. An epoxy primer is electrostatically applied. A final TGIC, UV resistant polyester powder coat is applied. Final coating mil thickness shall be no less than 6 mils.
- D. Setbacks.
 1. Spacing per plan.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.
- B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.
- C. Install site furnishings level, plumb, true, and securely anchored at locations indicated on Drawings.

END OF SECTION 12 93 00

SECTION 13 31 23 - PRE-ENGINEERED FABRIC SHADE STRUCTURES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

1.2 SUMMARY

- A. A single, State of California-licensed fabric shade structure contractor shall be responsible for the design, wet-stamped engineering drawings, fabrication, supply, and erection of the work specified herein, including foundations. The intent of this specification is to have only one shade contractor be responsible for all of the functions listed above.

1.3 SUBMITTALS

Submittals shall be made in accordance with General Provisions Section 2-5.3-Submittals:

- A. Provide proof of existing reference sites with structures of similar project scope and scale, and that are engineered to the same specifications.
- B. Provide a minimum of 7 fabric samples to demonstrate fabric color range, and a digital (PDF) or paper document showing a minimum of 9 powder coat color choices. Also, provide a letter of authorization from the fabric manufacturer delineating authorized use of the specified fabric.
- C. Provide proof of all quality assurance items, including;
 - 1. A list of at least 3 reference projects in California, with install dates that have been installed a minimum of 12 years.
 - 2. Proof of current State of California Contractor's License, Class A or Class B.
 - 3. Proof of current City of Los Angeles Approved Fabricator license.
 - 4. Proof of current IAS certification, as per Section 1.4D.

1.4 QUALITY ASSURANCE

- A. Fabrication and erection are limited to firms with proven experience in the design, fabrication, and erection of fabric shade structures, and such firms shall meet the following minimum requirements. No substitutions shall be allowed for the following:
 - 1. A single shade structure contractor shall design, engineer, manufacture, and erect the fabric shade structures, including the foundations, and shall provide a dedicated Project Manager throughout the entire Scope of Work related to the shade structure(s).

2. Shade structure contractor shall have at least 5 years' experience in the design, engineering, manufacture, and erection of fabric shade structures, engineered to California Building Code requirements with similar scope, and a successful construction record of in-service performance.
3. Shade structure contractor shall be a currently licensed contractor in the State of California Manufacturer shall be accredited by the IAS (International Accreditation Service) for Structural Steel Fabrication under CBC 2016, Section 1704.2.5.2.
4. The fabric shade structure contractor shall have a Corporate Quality Control program/manual, which describes their complete quality assurance program.

1.5 PROJECT CONDITIONS

- A. Structure Layout Dimensions: Verify layout information for fabric shade structure(s) shown on the drawings in relation to the property survey and existing structures, and verify locations by field measurements prior to erection of the fabric shade structure(s).

1.6 WARRANTY

- A. The contractor shall provide a 12-month warranty on all labor and materials.
- B. A supplemental warranty from the manufacturer shall be provided for a period of 10 years (pro-rated) on fabric and 10 years on the structural integrity of the steel, from date of substantial completion.
- C. The warranty shall not deprive the Owner of other rights the Owner may have under the provisions of the Contract Documents, and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 GENERAL

- A. The structures shall consist of 4 complete Tension Structures per the USA Shade design concepts for areas, A, B, C and D.
- B. The structures shall be manufactured by Shade Structures, Inc., d/b/a USA SHADE & Fabric Structures or approved equal and include the wet stamped engineering drawings, structural steel frame, fabric roof, steel cables, all fasteners, and installation of structures(s) including foundations as well as project management.
- C. Contact: USA SHADE & Fabric Structures
1085 N. Main Street, Suite C
Orange, CA 92867
Phone: 949.403 0030 Fax: 714.538.2440

Attn: Andy Stack
astack@usa-shade.com

- D. To be considered as an approved equal, product documentation, fabric samples and drawings showing connection details, as well as all quality assurance criteria as per section 1.4, shall be submitted to the Engineer within 30 days of the Notice to Proceed per General Provisions Section 4-1.6 – Trade Names or Equals. No substitutions will be allowed after the deadline.
- E. The fabric shade structure(s) shall conform to the current adopted version of the California Building Code 2016.
- F. All fabric shade structures are designed and engineered to meet the minimum of 115mph Wind Load, Risk Category II, Exposure C, and Seismic (earthquake) Load based on Seismic Design Category D, Seismic Risk Category II, and a Live Load of 5psf. All fabric shade structures shall be engineered with a zero wind pass-through factor on the fabric. When ASD Steel Design Method is used based on CBC 2016 Section 1605A.3.1, the load combinations Dead Load + 0.75 Live load + 0.75 Wind Load, and 0.6 Dead Load + Wind Load must be analyzed. NO EXCEPTIONS.
- G. Steel:
 - 1. All steel members of the fabric shade structure shall be designed in strict accordance with the requirements of the “American Institute of Steel Construction” (AISC) Specifications and the “American Iron and Steel Institute” (AISI) Specifications for Cold-Formed Members and manufactured in a IAS- (International Accreditation Service) accredited facility for Structural Steel Fabrication under CBC 2016 Section 1704.2.5.2.
 - 2. All connections shall have a maximum internal sleeving tolerance of .0625” using high-tensile strength steel sections with a minimum sleeve length of 6”.
 - 3. All non-hollow structural steel members shall comply to ASTM A-36. All hollow structural steel members shall be cold-formed, high-strength steel and comply with ASTM A-500-10, Grade B. All steel plates shall comply with ASTM A-572, Grade 50. All galvanized steel tubing shall be triple-coated for rust protection using an in-line electroplating coat process. All galvanized steel tubing shall be internally coated with zinc and organic coatings to prevent corrosion.
- H. Bolts:
 - 1. All structural field connections of the shade structure shall be designed and made with high-strength bolted connections using ASTM A-325, Grade B.
 - 2. Where applicable, all stainless steel bolts shall comply with ASTM F-593, Alloy Group 1 or 2. All bolt fittings shall include rubber washers for water-

tight seal at the joints. All nuts shall comply with ASTM F-594, Alloy Group 1 or 2.

I. Welding:

1. All shop-welded connections of the fabric shade structure shall be designed and performed in strict accordance with the requirements of the "American Welding Society" (AWS) Specifications. Structural welds shall be made in compliance with the requirements of the "pre-qualified" welded joints, where applicable and by certified welders. No onsite or field welding shall be permitted.
2. All full penetration welds shall be continuously inspected by an independent inspection agency and shall be tested to the requirement of the 2016 CBC.

J. Powder Coating:

1. Galvanized steel tubing preparation prior to powder coating shall be executed in accordance with solvent cleaning SSPC-SP1. Solvents such as water, mineral spirits, xylol, and toluol, which are to be used to remove foreign matter from the surface. A mechanical method prior to solvent cleaning, and prior to surface preparation, shall be executed according to Power Tool Cleaning SSPC-SP3, utilizing wire brushes, abrasive wheels, needle gun, etc.
2. Carbon structural steel tubing preparation prior to powder coating shall be executed in accordance with commercial blast cleaning SSPC-SP6 or NACE #3. A commercial blast cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, mill scale, rust, coating, oxides, corrosion, and other foreign material.
3. Powder coating shall be sufficiently applied (minimum 3 mils thickness) and cured at the recommended temperature to provide proper adhesion and stability to meet salt spray and adhesion tests, as defined by the American Society of Testing Materials.
4. Raw powder used in the powder coat process shall have the following characteristics:
 - a. Specific gravity: 1.68 +/- 0.05
 - b. Theoretical coverage: 114 +/- 4ft²/mil
 - c. Mass loss during cure: <1%
 - d. Maximum storage temperature: 80F
 - e. Interpon® 800 is a high-durability TGIC powder coating designed for exterior exposure. Tested against the most severe

specifications, Interpon 800 gives significantly improved gloss retention and resistance to color change.

5. Rust Protection Powder Undercoat Primer will be required on all structures. Sherwin-Williams® POWDURA® epoxy powder coating Z.R Primer shall be applied in accordance with the manufacturer's specifications. Primer should be fused only and then top coated with the selected powder coat to ensure proper inter-coat adhesion.

The primer's attributes shall be:

a.	Specific gravity (g/ml):	2.37
b.	Coverage at 1.0 mil (ft ² /lb):	81.6
c.	Adhesion: ASTM D-3359	5B
d.	Flexibility: ASTM D-552	Pass 1/8"
e.	Pencil hardness: ASTM D-3363	H-2H
f.	Impact resistance (in.lb): ASTM D-2794	Dir & Rev, 120 in-lbs
g.	Salt spray resistance: ASTM B-117	2000 hours
h.	Humidity resistance: ASTM D-4585	2000 hours
i.	60° Gloss: ASTM D-523	50 ~ 70
j.	Cure schedule (metal temp):	10min @ 200°C (390°F) 25min @ 135°C (275°F)
k.	Film thickness range (mils):	2.0 ~ 3.0

- K. Tension Cable: Steel wire rope cable is determined based on calculated engineering loads.

1. 0.25" (nominal) galvanized 7x19 strand core wire rope shall be used for tension loads up to 4,500 lbs.
2. 0.375" (nominal) galvanized 7x19 strand core wire rope shall be used for tension loads up to 9,000 lbs.
3. 0.5" (nominal) galvanized 6x19 strand core wire rope shall be used for tension loads up to 13,500 lbs.

- L. Fabric Roof Systems:

1. UV Shade Fabric:

- a. Shadesure® shade fabric is made of a UV-stabilized, high-density polyethylene (HDPE), as manufactured by Multiknit® (Pty) Ltd. HDPE mesh shall be a heat-stentered, three bar Rachel-knitted, lockstitch fabric with one monofilament and two tape yarns to ensure that the material will not unravel if cut. Raw fabric rolls shall be 9.8425 feet wide.
- b. Fabric Properties:
 - i. ~ Life Expectancy: minimum 8 years with continuous exposure to the sun
 - ii. ~ Fading: minimum fading after 5 years (3 years for Red)
 - iii. ~ Fabric Mass: 5.31 oz/yd² ~ 5.6 oz/yd² (180gsm ~ 190gsm)
 - iv. ~ Fabric Width: 9.8425 feet (3m)
 - v. ~ Roll Length: 164.04 feet (50m)
 - vi. ~ Roll Dimensions: 62.99 inches x 16.5354 inches (160cm x 42cm)
 - vii. ~ Roll Weight: +/- 66 lbs (+/- 30kg)
 - viii. ~ Minimum Temp: -13°F (-25°C)
 - ix. ~ Maximum Temp: +176°F (80°C)
- c. Fabric shall meet the following flame spread and fire propagation tests:
 - i. ASTM E-84
 - ii. NFPA 701 Test Method 2
 - iii. California's Office of the State Fire Marshal, Registered Flame Resistant Product

2. Stitching & Thread:

- a. All sewing seams are to be double-stitched.
- b. The thread shall be GORE® TENARA® mildew-resistant sewing thread, manufactured from 100% expanded PTFE (Teflon™). Thread shall meet or exceed the following:
 - i. Flexible temperature range
 - ii. Very low shrinkage factor

- iii. Extremely high strength, durable in outdoor climates
- iv. Resists flex and abrasion of fabric
- v. Unaffected by cleaning agents, acid rain, mildew, salt water, and is unaffected by most industrial pollutants
- vi. Treated for prolonged exposure to the sun
- vii. Rot resistant

3. Shade and UV Factors:

- a. Shade protection and UV screen protection factors shall be as follows:

i.	Color	UV Block %	Shade %
ii.	Pacific Blue	85%	80%~86%
iii.	Rain Forest Green	85%	79%~86%
iv.	Red	86%	80%~83%
v.	Silver	81%	80%~85%
vi.	Desert Sand	92%	80%~84%
vii.	Terracotta	82%	80%~83%
viii.	Yellow	89%	80%~82%

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The installation of fabric shade structures shall be performed by manufacturer or manufacturer-approved and certified contractor, which shall be bonded and holding a current contractor's license with the State of California's Contractors State License Board. All installation personnel must have experience in the erection of tensioned fabric structures.
- B. The installation shall comply with the manufacturer's instructions for assembly, installation, and erection, per approved drawings.
- C. Concrete:
 - 1. Unless noted otherwise for footings and piers by the Project Engineer, the concrete specification for footings, piers, slabs, curbs, and walkways shall meet a minimum 3,000psi at 28-day strength.

2. Concrete work shall be executed in accordance with the latest edition of American Concrete Building Code ACI 318-14.
3. Concrete specifications shall comply in accordance with the Section 033000 Cast-in-Place Concrete, detailed as per plans, and shall be as follows:
 - a. 28 Days Strength $F'_c = 3000$ psi
 - b. Aggregate: HR
 - c. Slump: 3 ~ 5 inch
 - d. Portland Cement shall conform to C-150
 - e. Aggregate shall conform to ASTM C-33
4. All reinforcement shall conform to ASTM A-615 grade 60.
5. Reinforcing steel shall be detailed, fabricated, and placed in accordance with the latest ACI Detailing Manual and Manual of Standard Practice.
6. Whenever daily ambient temperatures are below 80 degrees Fahrenheit, the contractor may have mix accelerators and hot water added at the batch plant (See Table 1).
7. The contractor shall not pour any concrete when the daily ambient temperature is to be below 55 degrees Fahrenheit.

TABLE 1

D.	Temperature Range	% Accelerator	Type
	Accelerator 75~80 degrees F	1%	High Early (non
	calcium) 70~75 degrees F	2%	High Early (non
	calcium) Below 70 degrees F	3%	High Early (non
	calcium) Foundations:		

1. All anchor bolts set in new concrete shall comply with ASTM F1554 GR 55.
2. All anchor bolts shall be Hot-Dip Galvanized.
3. Footings and full rebar cages shall be drilled, set, and poured as per manufacturer's specifications.

END OF SECTION 13 31 23

SECTION 26 05 19 – LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Building wires and cables rated 600 V and less.
 - 2. Connectors, splices, and terminations rated 600 V and less.
 - 3. Sleeves and sleeve seals for cables.

1.3 DEFINITIONS

- A. EPDM: Ethylene-propylene-diene terpolymer rubber.
- B. NBR: Acrylonitrile-butadiene rubber.

1.4 CODES, STANDARDS AND REFERENCES

- A. American Society for Testing and Materials (ASTM) – ASTM A53/A53M: Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- B. ANSI/NFPA 70: National Electrical Code, with California Amendments (CEC).
- C. California Code of Regulations (CCR) Title 24, Part 6, California Energy Code.
- D. National Electrical Contractors Association (NECA) - NECA 1: Good Workmanship in Electrical Construction.
- E. National Electrical Manufacturers Association (NEMA) – NEMA WC26: Bi-national Wire and Cable Packaging Standard.
- F. National Electrical Manufacturers Association (NEMA) – NEMA WC70: Non-Shielded Power Cable 2000 V or Less.
- G. International Electrical Testing Association (NETA) – Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- H. Occupational Safety and Health Administration (OSHA) – 29 CFR 1910.7: OSHA Occupational Safety and Health Standards.
- I. Underwriters Laboratories – UL 83 – Thermoplastic Insulated Wires.

- J. Underwriters Laboratories – UL 467 – Grounding and Bonding Equipment.
- K. Underwriters Laboratories – UL 486A – Wire Connectors and Soldering Lugs for Use with Copper Conductors.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Qualification Data: For testing agency.
- C. Field quality-control test reports.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the National Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.
 - 1. Testing Agency's Field Supervisor: Person currently certified by the National Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NFPA 70.

1.7 COORDINATION

- A. Set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Alcan Products Corporation; Alcan Cable Division
 - 2. American Insulated Wire Corp.; a Leviton Company.
 - 3. General Cable Corporation.
 - 4. Senator Wire & Cable Company.

5. Southwire Company.

B. Copper Conductors: Comply with NEMA WC 70.

2.2 CONNECTORS AND SPLICES

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

1. AFC Cable Systems, Inc.
2. Hubbell Power Systems, Inc.
3. O-Z/Gedney; EGS Electrical Group LLC.
4. 3M; Electrical Products Division.
5. Tyco Electronics Corp.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.3 SLEEVES FOR CABLES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

2.4 SLEEVE SEALS

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

1. Advance Products & Systems, Inc.
2. Calpico, Inc.
3. Metraflex Co.
4. Pipeline Seal and Insulator, Inc.

B. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and cable.

1. Sealing Elements: EPDM, NBR interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
2. Pressure Plates: Plastic. Include two for each sealing element.

3. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: By SDG&E.
- B. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type XHHW, single conductors in raceway.
- C. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW, single conductors in raceway.
- D. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway. See Section 260553 for Color Coding requirements.
- E. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway.
- F. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.
- G. Class 1 Control Circuits: Type THHN-THWN, in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.
- B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

- E. Support cables as required by Code.
- F. Identify and color-code conductors and cables according to Division 26 Section "Identification for Electrical Systems."
- G. Unless specifically shown otherwise, provide branch circuit and feeder homeruns with not more than three conductors, three neutral conductors and one ground conductor in a single raceway. The use of gutters or junction boxes to gather several homeruns into a large conduit to the panel will not be permitted.
- H. Provide separate neutral wire with each branch circuit. See Section 260553 "Identification for Electrical Systems" for Color Coding requirements.

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.
- B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm) of slack.

3.5 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
- B. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
- C. Rectangular Sleeve Minimum Metal Thickness:
 - 1. For sleeve rectangle perimeter less than 50 inches (1270 mm) and no side greater than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
 - 2. For sleeve rectangle perimeter equal to, or greater than, 50 inches (1270 mm) and 1 or more sides equal to, or greater than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).
- D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
- E. Cut sleeves to length for mounting flush with both wall surfaces.
- F. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level.

- G. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and cable unless sleeve seal is to be installed.
- H. Seal space outside of sleeves with grout for penetrations of concrete and masonry.
- I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and cable, using joint sealant appropriate for size, depth, and location of joint according to Division 07 Section "Joint Sealants."
- J. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at cable penetrations. Install sleeves and seal with firestop materials according to Division 07 Section "Penetration Firestopping."
- K. Roof-Penetration Sleeves: Seal penetration of individual cables with flexible boot-type flashing units applied in coordination with roofing work.
- L. Aboveground Exterior-Wall Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Size sleeves to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- M. Underground Exterior-Wall Penetrations: Install cast-iron "wall pipes" for sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between cable and sleeve for installing mechanical sleeve seals.

3.6 SLEEVE-SEAL INSTALLATION

- A. Install to seal underground exterior-wall penetrations.
- B. Use type and number of sealing elements recommended by manufacturer for cable material and size. Position cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.7 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections and prepare test reports.
- B. Perform tests and inspections and prepare test reports.
- C. Tests and Inspections:
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test for compliance with requirements.

2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
- D. Test Reports: Prepare a written report to record the following:
1. Test procedures used.
 2. Test results that comply with requirements.
 3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
- E. Remove and replace malfunctioning units and retest as specified above.

END SECTION 26 05 19

SECTION 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes methods and materials for grounding systems and equipment.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Other Informational Submittals: Plans showing dimensioned as-built locations of grounding features specified in Part 3 "Field Quality Control" Article, including the following:
 - 1. Ground rods.
- C. Qualification Data: For testing agency and testing agency's field supervisor.
- D. Field quality-control test reports.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the National Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.
 - 1. Testing Agency's Field Supervisor: Person currently certified by the National Electrical Testing Association to supervise on-site testing specified in Part 3.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS**2.1 CONDUCTORS**

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B 3.
 - 2. Stranded Conductors: ASTM B 8.
 - 3. Tinned Conductors: ASTM B 33.
 - 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.
 - 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
 - 6. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
 - 7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
- C. Grounding Bus: Rectangular bars of annealed copper, 1/4 by 2 inches (6 by 50 mm) in cross section, unless otherwise indicated; with insulators.

2.2 CONNECTORS

- A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.
 - 1. Pipe Connectors: Clamp type, sized for pipe.
- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.3 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel; 3/4 inch by 10 feet (19 mm by 3 m) in diameter.

PART 3 - EXECUTION**3.1 APPLICATIONS**

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger, unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare copper conductor, No. 2/0 AWG minimum.
 - 1. Bury at least 24 inches (600 mm) below grade.
 - 2. Duct-Bank Grounding Conductor: Bury 12 inches (300 mm) above duct bank when indicated as part of duct-bank installation.
- C. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
 - 1. Install bus on insulated spacers 1 inch (25 mm), minimum, from wall 6 inches (150 mm) above finished floor, unless otherwise indicated.
 - 2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, down to specified height above floor, and connect to horizontal bus.
- D. Conductor Terminations and Connections:
 - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
 - 2. Underground Connections: Exothermically Welded connectors.
 - 3. Connections to Structural Steel: Exothermically Welded connectors.

3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
 - 1. Feeders and branch circuits.
 - 2. Lighting circuits.
 - 3. Receptacle circuits.
 - 4. Single-phase motor and appliance branch circuits.
 - 5. Three-phase motor and appliance branch circuits.

6. Flexible raceway runs.
 7. Busway Supply Circuits: Install insulated equipment grounding conductor from grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.
- C. Signal and Communication Equipment: For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch (6-by-50-by-300-mm) grounding bus.
 2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 6 inches (150 mm) below finished floor or final grade, unless otherwise indicated.
1. Interconnect ground rods with grounding electrode conductor 24" below grade and as otherwise indicated. Make connections without exposing steel or damaging coating, if any.
 2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.
 3. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.
- D. Grounding and Bonding for Piping:

1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes, using a bolted clamp connector or by bolting a lug-type connector to a pipe flange, using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
 2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
 3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.
- E. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install tinned bonding jumper to bond across flexible duct connections to achieve continuity.
- F. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet (18 m) apart.
- G. Provide grounding for AT&T and Cox cable, per utilities standards.
- H. Ufer Ground (Concrete-Encased Grounding Electrode): Fabricate according to NFPA 70, using a minimum of 20 feet (6 m) of bare copper conductor not smaller than No. 4 AWG.
1. If concrete foundation is less than 20 feet (6 m) long, coil excess conductor within base of foundation.
 2. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building grounding grid or to grounding electrode external to concrete.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing and inspecting agency to perform the following field tests and inspections and prepare test reports:
- B. Perform the following tests and inspections and prepare test reports:
1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
 2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure

grounding terminal, and at individual ground rods. Make tests at ground rods before any conductors are connected.

- a. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
 3. Prepare dimensioned drawings locating each test well, ground rod and ground rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
- C. Report measured ground resistances that exceed the following values:
1. Power and Lighting Equipment or System with Capacity 500 kVA and Less: 10 ohms.
 2. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 ohm(s).
 3. Manhole Grounds: 10 ohms.
- D. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END SECTION 26 05 26

SECTION 26 05 33 – RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

1.3 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. EPDM: Ethylene-propylene-diene terpolymer rubber.
- C. FMC: Flexible metal conduit.
- D. LFMC: Liquidtight flexible metal conduit.
- E. LFNC: Liquidtight flexible nonmetallic conduit.
- F. NBR: Acrylonitrile-butadiene rubber.
- G. RNC: Rigid nonmetallic conduit.

1.4 SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
 - 1. Structural members in the paths of conduit groups with common supports.
 - 2. HVAC and plumbing items and architectural features in the paths of conduit groups with common supports.
- C. Manufacturer Seismic Qualification Certification: Submit certification that enclosures and cabinets and their mounting provisions, including those for internal components, will withstand seismic forces. Include the following:
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

- a. The term "withstand" means "the cabinet or enclosure will remain in place without separation of any parts when subjected to the seismic forces specified."
 - b. Cabinet or enclosure shall be seismically braced for zone IV as defined in the California Codes and Regulations.
- D. Qualification Data: For professional engineer and testing agency.
- E. Source quality-control test reports.

1.5 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. AFC Cable Systems, Inc.
 - 2. Alflec Inc.
 - 3. Allied Tube & Conduit; a Tyco International Ltd. Co.
 - 4. Anamet Electrical, Inc.; Anaconda Metal Hose.
 - 5. Electri-Flex Co.
 - 6. Manhattan/CDT/Cole-Flex.
 - 7. Maverick Tube Corporation.
 - 8. O-Z Gedney; a unit of General Signal.
 - 9. Wheatland Tube Company.
- B. Rigid Steel Conduit: ANSI C80.1.
- C. EMT: ANSI C80.3.
- D. FMC: Zinc-coated steel.
- E. LFMC: Flexible steel conduit with PVC jacket.

- F. Fittings for Conduit (Including all Types and Flexible and Liquidtight), EMT, and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.
 - 1. Fittings for EMT: , compression type.
- G. Joint Compound for Rigid Steel Conduit or IMC: Listed for use in cable connector assemblies, and compounded for use to lubricate and protect threaded raceway joints from corrosion and enhance their conductivity.

2.2 NONMETALLIC CONDUIT AND TUBING

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following.
- B. Manufacturers: Subject to compliance with requirements, provide product by one of the following:
 - 1. AFC Cable Systems, Inc.
 - 2. Anamet Electrical, Inc.; Anaconda Metal Hose.
 - 3. Arnco Corporation.
 - 4. CANTEX Inc.
 - 5. CertainTeed Corp.; Pipe & Plastics Group.
 - 6. Condux International, Inc.
 - 7. ElecSYS, Inc.
 - 8. Electric-Flex Co.
 - 9. Lamson & Sessions; Carlon Electrical Products.
 - 10. Manhattan/CDT/Cole-Flex.
 - 11. RACO; a Hubbell Company.
 - 12. Thomas & Betts Corporation.
- C. RNC: NEMA TC 2 Type EPC-40-PVC unless otherwise indicated.
- D. Fittings for RNC: NEMA TC 3; match to conduit or tubing type and material.

2.3 OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Arnco Corporation.
 2. Endot Industries Inc.
 3. IPEX Inc.
 4. Lamson & Sessions; Carlon Electrical Products.
- B. Description: Comply with UL 2024; flexible type, approved for plenum and riser installation.

2.4 BOXES, ENCLOSURES, AND CABINETS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
 2. EGS/Appleton Electric.
 3. Erickson Electrical Equipment Company.
 4. Hoffman.
 5. Hubbell Incorporated; Killark Electric Manufacturing Co. Division.
 6. O-Z/Gedney; a unit of General Signal.
 7. RACO; a Hubbell Company.
 8. Robroy Industries, Inc.; Enclosure Division.
 9. Scott Fetzer Co.; Adalet Division.
 10. Spring City Electrical Manufacturing Company.
 11. Thomas & Betts Corporation.
 12. Walker Systems, Inc.; Wiremold Company (The).
 13. Woodhead, Daniel Company; Woodhead Industries, Inc. Subsidiary.
- B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.
- C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.
- D. Metal Floor Boxes: Cast metal, fully adjustable, rectangular.
- E. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

F. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous-hinge cover with flush latch, unless otherwise indicated.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

G. Cabinets:

1. NEMA 250, Type 1, galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.

2.5 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

A. Description: Comply with SCTE 77.

1. Color of Frame and Cover: Gray
2. Configuration: Units shall be designed to flush burial and have integral closed bottom, unless otherwise indicated.
3. Cover: Weatherproof Galvanized Steel, secured by temper-resistant locking devices and having structural load rating consistent with enclosure.
4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
5. Cover Legend: Molded lettering "ELECTRIC", "TELEPHONE" as indicated for each service.
6. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
7. Handholes 12 inches wide by 24 inches long (300 mm wide by 600 mm long) and larger shall have inserts for cable racks and pulling-in irons installed before concrete is poured.
8. Handholes shall be traffic rated.

2.6 SLEEVES FOR RACEWAYS

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

2.7 SLEEVE SEALS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Advance Products & Systems, Inc.
 - 2. Calpico, Inc.
 - 3. Metraflex Co.
 - 4. Pipeline Seal and Insulator, Inc.
- B. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and cable.
 - 1. Sealing Elements: EPDM, NBR interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
 - 2. Pressure Plates: Plastic. Include two for each sealing element.
 - 3. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.8 SOURCE QUALITY CONTROL FOIR UNDERGROUND ENCLOSURES

- A. Handhole and Pull-Box Prototype Test: Test prototype of handholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.
 - 1. Tests of materials shall be performed by a independent testing agency.
 - 2. Strength tests of complete boxes and covers shall be by either an independent testing agency or manufacturer. A qualified registered professional engineer shall certify tests by manufacture.
 - 3. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012, and traceable to NIST standards.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:
 - 1. Exposed Conduit: Rigid steel conduit.
 - 2. Concealed Conduit, Aboveground: Rigid steel conduit.

3. Underground Conduit: RNC, Type EPC-40-PVC, direct buried.
 4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
 5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
- B. Comply with the following indoor applications, unless otherwise indicated:
1. Exposed, Not Subject to Physical Damage: EMT.
 2. Exposed, Not Subject to Severe Physical Damage: EMT.
 3. Exposed and Subject to Severe Physical Damage: Rigid steel conduit. Includes raceways in the following locations:
 - a. Kitchen
 - b. Mechanical rooms.
 4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
 6. Damp or Wet Locations: Rigid steel conduit.
 7. Raceways for Optical Fiber or Communications Cable in Spaces Used for Environmental Air: EMT.
 8. Raceways for Optical Fiber or Communications Cable Risers in Vertical Shafts: EMT.
 9. Raceways for Concealed General Purpose Distribution of Optical Fiber or Communications Cable: EMT.
 10. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4, in damp or wet locations.
- C. Minimum Raceway Size: 3/4-inch (21-mm) trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
1. Rigid Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.

3.2 INSTALLATION

- A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.
- B. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Support raceways as required and in compliance with code.
- E. Arrange stub-ups so curved portions of bends are not visible above the finished slab.
- F. Install no more than the equivalent of three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.
- G. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
- H. Raceways Embedded in Slabs:
 - 1. Run conduit larger than 1-inch (27-mm) trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
 - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
- I. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- J. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.
- K. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire.
- L. Raceways for Optical Fiber and Communications Cable: Install raceways, as follows:
 - 1. 3/4-Inch (19-mm) Trade Size and Smaller: Install raceways in maximum lengths of 50 feet (15 m).
 - 2. 1-Inch (25-mm) Trade Size and Larger: Install raceways in maximum lengths of 75 feet (23 m).

3. Install with a maximum of two 90-degree bends or equivalent for each length of raceway unless Drawings show stricter requirements. Separate lengths with pull or junction boxes or terminations at distribution frames or cabinets where necessary to comply with these requirements.
- M. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 2. Where otherwise required by NFPA 70.
- N. Flexible Conduit Connections: Use maximum of 72 inches (1830 mm) of flexible conduit for recessed and semirecessed lighting fixtures, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
1. Use LFMC in damp or wet locations subject to severe physical damage.
 2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.
- O. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall.
- P. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

- A. Direct-Buried Conduit:
1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom for pipe less than 6 inches (150 mm) in nominal diameter.
 2. Install backfill.
 3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches (300 mm) of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction.
 4. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through the floor, unless otherwise indicated. Encase elbows for stub-up ducts throughout the length of the elbow.

5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches (75 mm) of concrete.
 - b. For stub-ups at equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches (1500 mm) from edge of equipment pad or foundation. Install insulated grounding bushings on terminations at equipment.
6. Warning Planks: Bury warning planks approximately 12 inches (300 mm) above direct-buried conduits, placing them 24 inches (600 mm) o.c. Align planks along the width and along the centerline of conduit.

3.4 INSTALLATION OF UNDERGROUND HANHOLES AND BOXES

- A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.
- B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch (12.5 –mm) sieve to No. 4 (4.75-mm) sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch (25 mm) above finished grade.
- D. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare spaces for future cables, but short enough to preserve adequate working clearances in the enclosure.
- E. Field-cut openings for conduit according to enclosed manufacture's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.5 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
- B. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
- C. Rectangular Sleeve Minimum Metal Thickness:

1. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and no side greater than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
 2. For sleeve cross-section rectangle perimeter equal to, or greater than, 50 inches (1270 mm) and 1 or more sides equal to, or greater than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).
- D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
- E. Cut sleeves to length for mounting flush with both surfaces of walls.
- F. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level.
- G. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway unless sleeve seal is to be installed or unless seismic criteria require different clearance.
- H. Seal space outside of sleeves with grout for penetrations of concrete and masonry and with approved joint compound for gypsum board assemblies.
- I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway, using joint sealant appropriate for size, depth, and location of joint.
- J. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway penetrations. Install sleeves and seal with firestop materials.
- K. Roof-Penetration Sleeves: Seal penetration of individual raceways with flexible, boot-type flashing units applied in coordination with roofing work.
- L. Aboveground, Exterior-Wall Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- M. Underground, Exterior-Wall Penetrations: Install cast-iron "wall pipes" for sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway and sleeve for installing mechanical sleeve seals.

3.6 SLEEVE-SEAL INSTALLATION

- A. Install to seal underground, exterior wall penetrations.
- B. Use type and number of sealing elements recommended by manufacturer for raceway material and size. Position raceway in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.7 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

3.8 PROTECTION

- A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

END SECTION 26 05 33

SECTION 26 05 53 – IDENTIFICATION FOR ELECTRICAL SYSTEMS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Identification for raceways.
 - 2. Identification of power and control cables.
 - 3. Identification for conductors.
 - 4. Underground-line warning tape.
 - 5. Warning labels and signs.
 - 6. Instruction signs.
 - 7. Equipment identification labels.
 - 8. Miscellaneous identification products.

1.3 SUBMITTALS

- A. Product Data: For each electrical identification product indicated.
- B. Samples: For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.
- C. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.

1.4 QUALITY ASSURANCE

- A. Comply with ANSI A13.1.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1.5 COORDINATION

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.
- B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- C. Coordinate installation of identifying devices with location of access panels and doors.
- D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 POWER RACEWAY IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.
- B. Colors for Raceways Carrying Circuits at 600 V or Less:
 - 1. Black letters on an orange field.
 - 2. Legend: Indicate voltage.
- C. Self-Adhesive Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

2.2 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
- B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

2.3 CONDUCTOR IDENTIFICATION MATERIALS

- A. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

2.4 UNDERGROUND-LINE WARNING TAPE

A. Tape:

1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
2. Printing on tape shall be permanent and shall not be damaged by burial operations.
3. Tape material and ink shall be chemically inert, and not subject to degrading with exposed to acids, alkalis, and other destructive substances commonly found in soils.

B. Color and Printing:

1. Comply with ANSI Z535.1 through ANSI Z535.5.
2. Inscriptions for Red-Colored Tapes: ELECTRIC LINE, HIGH VOLTAGE.
3. Inscriptions for Orange-Colored Tapes: TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE.

2.5 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.

C. Baked-Enamel Warning Signs:

1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
2. 1/4-inch (6.4-mm) grommets in corners for mounting.
3. Nominal size, 7 by 10 inches (180 by 250 mm).

D. Warning label and sign shall include, but are not limited to, the following legends:

1. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES (915 MM)."

2.6 INSTRUCTION SIGNS

A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch (1.6 mm) thick for signs up to 20 sq. inches (129 sq. cm) and 1/8 inch (3.2 mm) thick for larger sizes.

1. Engraved legend with black letters on white face.
2. Punched or drilled for mechanical fasteners.
3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.7 EQUIPMENT IDENTIFICATION LABELS

- A. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch (10 mm).

2.8 CABLE TIES

- A. General-Purpose Cable Ties: Fungus inert, self extinguishing, one piece, self locking, Type 6/6 nylon.
 1. Minimum Width: 3/16 inch (5 mm).
 2. Tensile Strength at 73 deg F (23 deg C), According to ASTM D 638: 12,000 psi (82.7 MPa).
 3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
 4. Color: Black except where used for color-coding.

2.9 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in Division 09 painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

- E. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- F. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (7.6-m) maximum intervals in congested areas.
- G. Cable Ties: For attaching tags. Use general-purpose type.
- H. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches (150 to 200 mm) below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches (400 mm) overall.

3.2 IDENTIFICATION SCHEDULE

- A. Color Coding: Conductors and cables shall be color coded by the manufacturer for the entire length. Wrapping color tapes are not permitted. Color coding shall be as follows:

	120/208V System	277/480V System
Phase A:	Black	Brown
Phase B:	Red	Orange
Phase C:	Blue	Yellow
Neutral:	White	Grey
Ground:	Green	Green
Isolated Ground:	Green/Yellow Stripe	Green/Yellow stripe

- B. Neutral Wires shall have color spiral to match associated phase.
- C. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
 - 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
 - 2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
 - 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.
- D. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.
 - 1. Limit use of underground-line warning tape to direct-buried cables.

2. Install underground-line warning tape for both direct-buried cables and cables in raceway.
- E. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- F. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels.
1. Comply with 29 CFR 1910.145.
 2. Identify system voltage with black letters on an orange background.
 3. Apply to exterior of door, cover, or other access.
 4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:
 - a. Power transfer switches.
 - b. Controls with external control power connections.
- G. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
- H. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
1. Labeling Instructions:
 - a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on 1-1/2-inch- (38-mm-) high label; where two lines of text are required, use labels 2 inches (50 mm) high.
 - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
 - c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.

- d. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

2. Equipment to Be Labeled:

- a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be self-adhesive, engraved, laminated acrylic or melamine label.
- b. Enclosures and electrical cabinets.
- c. Access doors and panels for concealed electrical items.
- d. Switchboards.
- e. Disconnect switches.

END SECTION 26 05 53

SECTION 26 27 26 – WIRING DEVICES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Receptacles, receptacles with integral GFCI, and associated device plates.
 - 2. Wall-box motion sensors.
 - 3. Snap switches and wall-box dimmers.
 - 4. Solid-state fan speed controls.
 - 5. Wall-switch.
 - 6. Floor service outlets.

1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- D. RFI: Radio-frequency interference.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of wiring device and associated wall plate through one source from a single manufacturer. Insofar as they are available, obtain all wiring devices and associated wall plates from a single manufacturer and one source.

- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NFPA 70.

1.6 COORDINATION

- A. Receptacles for Owner-Furnished Equipment: Match plug configurations.
 - 1. Cord and Plug Sets: Match equipment requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
 - 1. Cooper Wiring Devices; a division of Cooper Industries, Inc. (Cooper).
 - 2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
 - 3. Leviton Mfg. Company Inc. (Leviton).
 - 4. Pass & Seymour/Legrand; Wiring Devices & Accessories (Pass & Seymour).

2.2 STRAIGHT BLADE RECEPTACLES

- A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Cooper; 5351 (single), 5352 (duplex).
 - b. Hubbell; HBL5351 (single), CR5352 (duplex).
 - c. Leviton; 5891 (single), 5352 (duplex).
 - d. Pass & Seymour; 5381 (single), 5352 (duplex).

2.3 GFCI RECEPTACLES

- A. General Description: Straight blade, non-feed-through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, and UL 943, Class A, and include indicator light that is lighted when device is tripped.
- B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; GF20.
 - b. Pass & Seymour; 2084.

2.4 CORD AND PLUG SETS

- A. Description: Match voltage and current ratings and number of conductors to requirements of equipment being connected.
 1. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with green-insulated grounding conductor and equipment-rating ampacity plus a minimum of 30 percent.
 2. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

2.5 SNAP SWITCHES

- A. Comply with NEMA WD 1 and UL 20.
- B. Switches, 120 V, 20 A:
 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; 2221 (single pole), 2222 (two pole), 2223 (three way), 2224 (four way).
 - b. Hubbell; CS1221 (single pole), CS1222 (two pole), CS1223 (three way), CS1224 (four way).
 - c. Leviton; 1221-2 (single pole), 1222-2 (two pole), 1223-2 (three way), 1224-2 (four way).
 - d. Pass & Seymour; 20AC1 (single pole), 20AC2 (two pole), 20AC3 (three way), 20AC4 (four way).

2.6 FAN SPEED CONTROLS

- A. Modular, 120-V, full-wave, solid-state units with integral, quiet on-off switches and audible frequency and EMI/RFI filters. Comply with UL 1917.
 1. Continuously adjustable rotary knob, 5 A.
 2. Three-speed adjustable rotary knob, 1.5 A.

2.7 WALL PLATES

- A. Single and combination types to match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
 2. Material for Finished Spaces: Smooth, high-impact thermoplastic.
 3. Material for Unfinished Spaces: Smooth, high-impact thermoplastic.
 4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in "wet locations."
- B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with type 3R weather-resistant, die-cast aluminum with lockable cover.

2.8 FINISHES

- A. Color: Wiring device color shall be white. Switched receptacles (Title 24) shall be gray. Wiring devices on Emergency Power shall be red color.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.
- B. Coordination with Other Trades:
1. Take steps to ensure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.
 2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
 3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
 4. Install wiring devices after all wall preparation, including painting, is complete.
- C. Conductors:
1. Do not strip insulation from conductors until just before they are spliced or terminated on devices.
 2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.

D. Device Installation:

1. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the right.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Dimmers:

1. Install dimmers within terms of their listing.
2. Verify that dimmers used for fan speed control are listed for that application.
3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device listing conditions in the written instructions.

- H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.
- I. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 IDENTIFICATION

- A. Comply with Division 26 Section "Identification for Electrical Systems."
 - 1. Receptacles: Identify panelboard and circuit number from which served. Use hot, stamped or engraved machine printing with white-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections and prepare test reports.
 - 1. Test Instruments: Use instruments that comply with UL 1436.
 - 2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated LED indicators of measurement.
- B. Tests for Convenience Receptacles:
 - 1. Line Voltage: Acceptable range is 105 to 132 V.
 - 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is not acceptable.
 - 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 - 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 - 5. Using the test plug, verify that the device and its outlet box are securely mounted.
 - 6. The tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

END SECTION 26 27 26

SECTION 26 56 00 – EXTERIOR LIGHTING**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Exterior luminaires with lamps.
 - 2. Luminaire-mounted photoelectric relays.
- B. Related Sections:
 - 1. Division 26 Section "Interior Lighting" for exterior luminaires normally mounted on exterior surfaces of buildings.

1.3 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color-rendering index.
- C. LER: Luminaire efficacy rating.

1.4 SUBMITTALS

- A. Product Data: For each luminaire, and support component, arranged in order of lighting unit designation. Include data on features, accessories, finishes, and the following:
 - 1. Physical description of luminaire, including materials, dimensions, effective projected area, and verification of indicated parameters.
 - 2. Details of attaching luminaires and accessories.
 - 3. Details of installation and construction.
 - 4. Luminaire materials.
 - 5. Photometric data based on laboratory tests of each luminaire type, complete with indicated lamps, drivers, and accessories.
 - a. Testing Agency Certified Data: For indicated luminaires, photometric data shall be certified by a qualified independent

testing agency. Photometric data for remaining luminaires shall be certified by manufacturer.

- b. Manufacturer Certified Data: Photometric data shall be certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.
- 6. Photoelectric relays.
- 7. Lamps, including life, output, CCT, CRI, lumens, and energy-efficiency data.
- 8. Means of attaching luminaires to supports, and indication that attachment is suitable for components involved.
- B. Qualification Data: For qualified agencies providing photometric data for lighting fixtures.
- C. Field quality-control reports.
- D. Operation and Maintenance Data: For luminaires and poles to include in emergency, operation, and maintenance manuals.
- E. Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

- A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with IEEE C2, "National Electrical Safety Code."
- D. Comply with NFPA 70.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace products that fail in materials or workmanship; that corrode; or that fade, stain, perforate, erode, or chalk due to effects of weather or solar radiation within specified warranty period. Manufacturer may exclude lightning damage, hail damage, vandalism, abuse, or unauthorized repairs or alterations from special warranty coverage.
 - 1. Warranty Period for Luminaires: Five years from date of Substantial Completion.

2. Warranty Period for Metal Corrosion: Five years from date of Substantial Completion.
3. Warranty Period for Color Retention: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Provide product indicated on Drawings. All lamps shall be LED.

2.2 GENERAL REQUIREMENTS FOR LUMINAIRES

- A. Luminaires: Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.
- B. Lateral Light Distribution Patterns: Comply with IESNA RP-8 for parameters of lateral light distribution patterns indicated for luminaires.
- C. Metal Parts: Free of burrs and sharp corners and edges.
- D. Sheet Metal Components: Corrosion-resistant aluminum unless otherwise indicated. Form and support to prevent warping and sagging.
- E. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.
- F. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses. Designed to disconnect driver when door opens.
- G. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
- H. Reflecting Surfaces: Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:
 1. White Surfaces: 85 percent.
 2. Specular Surfaces: 83 percent.
 3. Diffusing Specular Surfaces: 75 percent.
- I. Lenses and Refractors Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

- J. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.
- K. Factory-Applied Finish for Steel luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - 1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC-SP 8, "Pickling."
 - 2. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.
 - a. Color: As selected by Architect from manufacturer's full range.
- L. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and drivers. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
 - 1. Label shall include the following lamp and ballast characteristics:
 - a. "USES ONLY" LED lamp type.
 - b. CCT and CRI for all luminaires.

2.3 LUMINAIRE-MOUNTED PHOTOELECTRIC RELAYS

- A. Comply with UL 773 or UL 773A.
- B. Contact Relays: Factory mounted, single throw, designed to fail in the on position, and factory set to turn light unit on at 1.5 to 3 fc and off at 4.5 to 10 fc with 15-second minimum time delay. Relay shall have directional lens in front of photocell to prevent artificial light sources from causing false turnoff.
 - 1. Relay with locking-type receptacle shall comply with ANSI C136.10.
 - 2. Adjustable window slide for adjusting on-off set points.

PART 3 - EXECUTION

3.1 LUMINAIRE INSTALLATION

- A. Install LED lamps in each luminaire.
- B. Fasten luminaire to indicated structural supports.

1. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.
- C. Adjust luminaires that require field adjustment or aiming. Include adjustment of photoelectric device to prevent false operation of relay by artificial light sources, favoring a north orientation.

3.2 GROUNDING

- A. Ground metal poles and support structures according to Division 26 Section "Grounding and Bonding for Electrical Systems."
 1. Install grounding electrode for each pole unless otherwise indicated.
 2. Install grounding conductor pigtail in the base for connecting luminaire to grounding system.

3.3 FIELD QUALITY CONTROL

- A. Inspect each installed fixture for damage. Replace damaged fixtures and components.
- B. Illumination Observations: Verify normal operation of lighting units after installing luminaires and energizing circuits with normal power source.
 1. Verify operation of photoelectric controls.
- C. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain luminaire lowering devices.

END SECTION 26 56 00

SECTION 31 10 00 - SITE CLEARING**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Protecting existing vegetation to remain.
 - 2. Removing existing vegetation.
 - 3. Clearing and grubbing.
 - 4. Stripping and stockpiling soil.
 - 5. Removing above- and below-grade site improvements.
 - 6. Disconnecting, capping or sealing, and abandoning site utilities in place.
 - 7. Temporary erosion and sedimentation control.

1.3 DEFINITIONS

- A. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.
- B. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "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.
- 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 according to requirements in Section 015639 "Temporary Tree and Plant Protection."
- 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 video recordings.
 - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plant designated to remain.
- B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

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. Salvageable Improvements: Carefully remove items indicated to be salvaged and store at a location agreed upon with the Owner.
- C. Utility Locator Service: Notify utility locator 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 plant 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 plant 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 soil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Locate and clearly identify trees, shrubs, and other vegetation to remain. Wrap a 1'inch blue vinyl tie tape flag around each tree trunk at 54 inches above ground.
- C. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.
- B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

- A. Protect trees and plants remaining on-site according to requirements in Section 015639 "Temporary Tree and Plant Protection."
- B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.4 EXISTING UTILITIES

- A. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.

3.5 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
 - a. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - b. Grind down stumps and remove roots larger than 2 inches (50 mm) in diameter, obstructions, and debris to a depth of 18 inches (450 mm) below exposed subgrade.
 - c. Use only hand methods for grubbing within protection zones.
 - d. Chip removed tree branches and dispose of off-site.
- 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 and compact each layer to a density equal to adjacent original ground.
- C. Clearing and Grubbing shall consist of the protection of all items to remain, saw-cutting, demolition and disposal of existing improvements, salvaging existing materials (topsoil) and improvements as specified or shown on the Plans, removal of deleterious materials, and proper disposal from the Project site of all existing surface and subsurface materials as required to construct the improvement as shown on the Plans and as described in the Specifications. Typical items to be removed include, but are not limited to, trash, fences, posts, poles, gates, street signs, AC dikes, AC paving, striping (by grinding), decorative concrete, concrete driveway entrance, concrete sidewalk, concrete curb and gutter, concrete headwall structures, retaining walls, landscape border logs, decorative walls, concrete pavers, reinforcing steel, rock, boulders and cobbles, trees, stumps and roots, shrubs, other vegetation or organic materials, soil, irrigation systems, spoils, debris, sewer pipe, storm drain pipe, storm drain inlets and grates, electrical conduits and pull boxes, wire, utility cabinets or boxes,

drinking fountains, benches, guardrails, delineators, pavement markers, and all other objectionable materials which interfere with the Work whether or not specifically indicated on the Plans or otherwise shown to be protected or relocated. Abandoned utility lines and structures not removed with Engineer's approval shall be filled with blown sand and conduits plugged. Concrete and bituminous pavement shall be removed to neatly sawed edges. All removed materials not indicated for salvage, re-use or re-cycle shall become the property of the Contractor and shall be disposed of offsite at a legal site or recycling facility.

3.6 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to depth indicated on Drawings of 6 inches in a manner to prevent intermingling with underlying subsoil or other waste materials.
 - 1. Remove subsoil and non-soil materials from topsoil, including clay lumps, gravel, and other objects larger than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.
- C. Stockpile topsoil away from edge of excavations without intermixing with subsoil or other materials. 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. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.
 - 4. Stockpile surplus topsoil to allow for re-spreading deeper topsoil.

3.7 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.
 - 2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.8 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 31 10 00

SECTION 31 20 00 – EARTHWORK**PART 1 - GENERAL**

- 1.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- 1.2 SUMMARY
- A. Section Includes:
1. Preparing and grading subgrades for slabs-on-grade, walks, pavements and landscaping
 2. Excavating and backfilling for buildings and structures.
 3. Drainage and moisture-control fill course for concrete slabs-on-grade.
 4. Base course for pavements.
 5. Subsurface drainage backfill for walls and trenches.
 6. Excavating and backfilling trenches for utilities and appurtenances outside building lines.
- B. Related Sections:
1. Division 03 Section "Cast-in-Place Concrete" for granular course beneath the slab-on- grade.
 2. Division 31 Section "Site Clearing" for site stripping, grubbing, and removal of above- and below-grade improvements and utilities.
- 1.3 REFERENCE SPECIFICATION
- A. Perform all work in accordance with applicable provisions of "Standard Specifications for Public Works Construction", latest editions, and UBC and 2013 CBC. Unless otherwise noted, mention herein of section numbers refers to sections of the Reference Specification. Where Reference Specification conflicts with these Specifications, these Specifications shall govern.
- 1.4 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 the surface pavement in paving system.

- 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 when sufficient approved soil material is not available from excavations
- E. Drainage Fill: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
- F. Excavation: Removal of material encountered to subgrade elevations and the re-use or disposal of materials removed.
 - 1. Authorized Additional Excavation: Excavation below subgrade elevations as directed by City Inspector.
 - 2. Unauthorized Excavation: Excavation below subgrade elevations without direction by Agency. Unauthorized excavation, as well as remedial work directed by City Inspector, 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 building lines.
- L. Compaction: Any method of mechanically stabilizing a material by increasing its density at a controlled moisture condition. "Degree of Compaction" is expressed as a percentage of the maximum dry density obtained by the test procedure described in ASTM D 1557 for general soil types abbreviated in this Specification as 90 percent of maximum dry density".
- M. Hard Material: Weathered rock, dense consolidated deposits or conglomerate materials which are not included in the definition of "rock" but which usually require the use of heavy excavation equipment, ripper teeth, or jack hammers for removal

- N. Lift: A layer or course of soil placed on top of previously prepared or placed soil in a fill or embankment.
- O. Unsatisfactory Material: Soil or other material identified as having insufficient strength or stability to carry intended loads without excessive consolidation or loss of stability.
- P. Unclassified Fill as defined in section 300-4.
- Q. Unclassified Cut as any objectionable material, including organic and inorganic debris which is cut from the site.

1.5 SUBMITTALS

- A. Product Data: For each type of the following manufactured products required:
 - 1. Warning Tape
 - 2. Geotextile
 - 3. Stormwater Water Quality Filter Media
- B. Location of Borrow Materials.
- C. Material Test Reports
- D. 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. Pre-excavation photographs of existing retaining wall along the south side of the property.

1.6 QUALITY ASSURANCE

- A. Codes and Standards: Perform earthwork complying with requirements of authorities having jurisdiction
- B. Testing and Inspection Service: Agency will employ a qualified independent geotechnical engineering testing agency to classify proposed on-site and borrow soils to verify that soils comply with specified requirements and to perform required field and laboratory testing.
- C. Pre-excavation Conference: Before commencing earthwork, meet with representatives of the governing authorities, Agency, Engineer, consultants, Geotechnical Engineer, independent testing agency, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least 3 working days prior to

convening conference. Record discussions and agreements and furnish a copy to each participant.

1.7 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt existing utilities serving facilities occupied by the Agency or others except when permitted in writing by the Engineer and then only after acceptable temporary utility services have been provided.
 - 1. Provide a minimum 48-hours' notice to the Agency and/or Engineer and receive written notice to proceed before interrupting any utility.
- B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies and owner to shutoff services if lines are active.
- C. 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 Agency and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by Agency or authorities having jurisdiction.
- D. 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 Agency.
- E. Utility Locator Service: Notify UNDERGROUND SERVICE ALERT for area where Project is located before beginning earth moving operations.
- F. Do not commence earth moving operations until temporary erosion/sedimentation control measures are in place.

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 materials imported or excavated on the property determined to

be suitable as referenced in the project Geotechnical Investigation Report; and approved by the Geotechnical Engineer.

- 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. Refer to Geotechnical Investigation Report, for unsuitable materials and disposal methods for unsatisfactory soils.
- D. Backfill and Fill Materials: Satisfactory soil materials.
- E. Base Material: Shall conform to crushed aggregate base or crushed miscellaneous base, as specified on plan, in accordance with section 200-2.2 or 200-2.4, respectively, of the Reference Specification, and compacted to at least 95% of the maximum dry density as determined by ASTM Test Method D 1557.
- F. Engineered Fill: Base Materials and compacted fill materials
- G. Bedding Material: Shall be base materials with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve; or clean sand classified in accordance with ASTM D 2487.
- H. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, ASTM D 448, coarse aggregate grading size 57, with 100 percent passing a 1-1/2-inch sieve and not more than 5 percent passing a No. 8 sieve
- I. Filtering Material: Evenly graded mixture of natural or crushed gravel or crushed stone and natural sand, with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 50 sieve.
- J. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 GEOTEXTILES

- A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
 - 1. Survivability: Class 2; AASHTO M 288.
 - 2. Grab Tensile Strength: 157 lbf (700 N); ASTM D 4632.
 - 3. Sewn Seam Strength: 142 lbf (630 N); ASTM D 4632.
 - 4. Tear Strength: 56 lbf (250 N); ASTM D 4533.
 - 5. Puncture Strength: 56 lbf (250 N); ASTM D 4833.

6. Apparent Opening Size: No. 60 sieve, maximum; ASTM D 4751.
7. Permittivity: 0.2 per second, minimum; ASTM D 4491.
8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

2.3 ACCESSORIES

- A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility; 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.
 6. White: Steam systems
- B. 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.
 6. White: Steam 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. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Tree protection is specified in the Section 31 10 00 "Site Clearing". Refer to landscape architectural plans for instructions.

- D. Prepare subgrade and place base materials in accordance with sections 301-1.2 and 301-2, respectively, of the Reference Specification.

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. Dewatering, if required, shall be done in accordance with NPDES waste discharge requirements. Contractor shall obtain all necessary Dewatering permits from state and local jurisdictions.
- C. 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 EXPLOSIVES

- A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

- A. General: Excavation shall be to the contours, elevations and dimensions indicated. Keep excavations free from water and debris while construction is in progress. Notify the Agency immediately in writing where it becomes necessary to remove hard, soft, weak, or wet material to a depth greater than indicated. Unless otherwise indicated, concrete placed below grade will be formed and excavations shall allow for placement and removal of forms. Side cuts shall be cribbed and shored as required.
- B. Unclassified Excavation: Excavation is unclassified and includes excavation to required subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions as described in the referenced Geotechnical Investigations Report.
 - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials, replace with satisfactory soil materials.
 - 2. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be

removed; together with soil, boulders, and rocks.

3. Rock fragments greater than 3 inches in diameter shall be taken off-site or placed in accordance with the recommendations of the Geotechnical Engineer in areas designated as suitable for rock disposal.

3.5 STABILITY OF EXCAVATIONS

- A. Comply with local codes, ordinances, and requirements of authorities having jurisdiction to maintain stable excavations.
- B. Unshored Temporary Excavations:
 1. Unshored temporary excavations may be sloped back at 1 to 1 (horizontal to vertical) or flatter up to 5 feet in height. Where sloped embankments are used, the tops of the slopes should be barricaded to prevent vehicles and storage loads within seven feet of the tops of the slopes. If the temporary construction slopes will be maintained during the rainy season, construct berms along the tops of the slopes where necessary to prevent run-off water from entering the excavation and eroding the slope faces.

3.6 EXCAVATION FOR STRUCTURES

- A. Excavation Limits:
 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. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 0.10 foot. 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.

3.7 EXCAVATION FOR WALKS AND PAVEMENTS

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

3.8 EXCAVATION FOR UTILITY TRENCHES

- A. Excavation made with power-driven equipment is not permitted within two feet of any known utility or subsurface construction. For work immediately adjacent to or for excavations exposing a utility or other buried obstruction, use hand or light equipment excavation. Start hand or light equipment excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured. Support uncovered lines and other existing work affected by the excavation work of this Section until approval for backfill is granted by the geotechnical engineer. Immediately report damage to utility lines or subsurface construction to the Agency.
- B. Where unidentified existing utilities are encountered, determine whether these are active or abandoned. Remove interfering portions of abandoned utilities and cap or plug open ends of pipe to remain. The cap or plug must seal the opening in such a manner that would permit remaining portions of the utility to be reactivated. Notify Agency for instructions on utilities which are determined to be active. Do not proceed without instructions, except to correct an immediate hazard or emergency condition. Relocation work performed on an active utility without obtaining prior approval from Owner shall be done at the Contractor's expense and liability.
- C. In areas where compacted backfill has been placed, additional consolidation may occur after completion due to changes in moisture content and surcharge. Utility connections crossing this backfill, and improvements adjoining the building at the backfill line shall be installed considering this additional consolidation, or sufficient time shall be scheduled between backfilling operations and such improvements to allow this consolidation to take place. Damage to utilities or other improvements due to Contractor's negligence regarding this paragraph shall be repaired at the Contractor's expense.
- D. Protect newly backfilled areas and adjacent structures, slopes, or grades from traffic, erosion settlement, and any other damage. Repair and re-establish damaged or eroded grades and slopes and restore surface construction prior to acceptance
- E. Cutting Pavement, Curbs, and Gutters: Saw cut with neat, parallel, straight lines one foot wider than trench width on each side of trenches and one foot beyond each edge of pits. If an existing pavement joint or cracked area is within two feet outside of a designated sawcut line shown on the Drawings, removal and resurfacing shall be to that joint, and/or shall include the crack or cracked area, unless otherwise approved by Agency.
- F. Contractor shall pothole at all identifiable crossings of existing utilities prior to any trenching operations and provide Architect with a survey of the top elevations (and bottom elevations, if applicable), of possible interferences so that an evaluation of necessary adjustments to the current profile or alignment may be made. Additionally, Architect shall be given the opportunity to view possible conflicts in the field prior to providing revised designs.
- G. Provide a minimum cover from grade of 3 feet for water mains and gas mains. Storm

drains and sewers shall be to the depths indicated. Where settlements greater than the tolerance allowed herein for grading occur in trenches and pits due to improper compaction, excavate to the depth necessary to rectify the problem, then backfill and compact the excavation as specified herein and restore the surface to the required elevation.

- H. Keep excavations free from water while construction is in progress.
- I. Notify the Owner immediately in writing if it becomes necessary to remove rock or hard, unstable, or otherwise unsatisfactory material to a depth greater than indicated. Excavate large rock, boulders, and other unyielding material to an overdepth at least 6 inches below the bottom of the pipe, conduit, duct and appurtenances, unless otherwise indicated or specified. Over- excavate soft, weak, or wet excavations to an overdepth at least 6 inches below the bottom of the pipe, conduit, duct or appurtenances unless otherwise indicated or specified.
- J. Excavate trenches to indicated slopes, lines, depths, and invert elevations.
- K. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, except where sloping of sides is allowed. Sides of trenches shall not be sloped from the bottom of the trench up to the elevation of the top of the pipe. See plans for detail.
- L. At the option of the Contractor, the excavations may be cut to an overdepth of not less than 4 inches and refilled to required grade as specified.
- M. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove stones and sharp objects to avoid point loading.
 - 1. For pipes or conduit less than 6 inches in nominal diameter and flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
 - 2. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped sand backfill.
 - 3. Dig bell holes and depressions for joints after trench has been graded. Dimension of bell holes shall be as required for properly making the particular type of joint to ensure that the bell does not bear on the bottom of the excavation.

3.9 APPROVAL OF SUBGRADE

- A. Notify Agency when excavations have reached required subgrade.
- B. When City Inspector determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired roller to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 - 1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph (5 km/h).
 - 2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.
- D. Unforeseen additional excavation and replacement material will be paid for according to Contract provisions for Changes in Work.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.10 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending indicated bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used to bring elevations to proper position when acceptable to the Architect.
 - 1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Agency.

3.11 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.

3.12 SOIL TREATMENT

- A. All chemical applications used for soil treatment are subject to the approval of the

Owner.

- B. Do not apply soil treatment solution until excavating, filling and grading operations are completed and prior to any membrane being placed beginning concrete placement or other construction activities.
- C. To ensure penetration, do not apply soil treatment to excessively wet soils or during inclement weather. Comply with handling and application instruction of soil toxicant manufacturer.
- D. Remove foreign matter which could decrease effectiveness of treatment on areas to be treated. Loosen, rake, and level soil to be treated, except previously compacted areas under foundations.
- E. Apply soil treatment solution at rates recommended by soil toxicant manufacturer.
- F. Allow not less than 12 hours for drying after application, before beginning concrete placement or other construction activities
- G. Reapply soil treatment solution to areas disturbed by subsequent excavation or other construction activities following application.

3.13 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Acceptance of 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.

3.14 UTILITY TRENCH BACKFILL AND COMPACTION

- A. Backfilling of exterior utility trenches shall not be undertaken until geotechnical engineer has received 24-hours' notice, until required tests and inspections have been completed, and until as-built location notes have been furnished. Remove uninspected backfill in accordance with requirements of this specification. Use hand-operated,

plate-type, vibratory, or other suitable hand tampers in areas not accessible to larger rollers or compactors. Avoid damaging pipes and protective pipe coatings.

- B. Place backfill material in accordance with Section 306-1.3.2 of the Reference Specifications and achieve at least 90% of the maximum density. The top 12 inches of backfill in the building or paved areas shall be compacted to 90% of maximum density.
- C. Compaction by ponding or flooding will not be permitted.
- D. Place and compact bedding course on rock and other unyielding bearing surfaces and to fill unauthorized excavations. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- E. Concrete backfill trenches that carry below or pass under footings and that are excavated within 18 inches of footings. Place concrete to level of bottom of footings.
- F. Provide 4-inch-thick concrete base slab support for piping or conduit less than 2'-6" below surface of roadways. After installation and testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway base.
- G. Place and compact initial backfill of satisfactory soil material or base material, free of particles larger than 1 inch, to a height of 12 inches over the utility pipe or conduit.
 - 1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.

3.15 FILL

- A. Preparation: Scarify and remove vegetation, topsoil, debris, wet, and unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placing fills.
 - 1. The scarified ground shall be brought to optimum moisture, mixed as required, and compacted as specified. If the scarified zone is greater than 12 inches in depth, the excess shall be removed and placed in lifts restricted to six inches.
 - 2. 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 base materials
 - 4. Under building slabs, use base materials

5. Under footings and foundations, use drainage fill materials.

- C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.16 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.
 - a. Stockpile or spread and dry removed wet satisfactory soil material.

3.17 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 6 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure. Keep rollers and other heavy equipment at least 18 inches from footings, foundations, piers and walls of buildings and accessory construction. Use mechanical and hand tampers weighing at least 90 pounds with a maximum face area of 48 inches square to compact backfill within 18 inches of construction and where access is restricted.
- C. Percentage of Maximum Dry Density Requirements: Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
 1. For general site fills, compact each layer of backfill or fill material at 90 percent maximum dry density.
 2. Under structures, building slabs, and steps, scarify and recompact top 24 inches below footing or slab and each layer of backfill or fill soil material at 95 percent maximum dry density.
 3. Under walkways and paving, scarify and recompact top 12 inches below subgrade and compact each layer of backfill or fill soil material at 95 percent maximum dry density.
 4. Under lawn or unpaved areas, scarify and recompact top 6 inches below

subgrade and compact each layer of backfill or fill soil material at 95 percent maximum dry density.

3.18 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.
 - 3. If necessary, the Contractor's selected equipment and construction procedure shall be altered, changed or modified in order to meet the specified compaction requirements. Flooding and water jetting is prohibited.
- 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. Lawn or Unpaved Areas: Plus or minus 0.10 foot, unless otherwise indicated.
 - 2. Concrete Walks: Plus or minus 0.02 foot.
 - 3. Pavements:
 - a. Concrete: 0.02 foot minus, with no high spots.
 - b. Asphalt: 0.05 foot minus, with no high spots.
- C. Grading inside Building Lines: Finish subgrade to a tolerance of ½ inch when tested with a 10- foot straightedge.

3.19 SUBSURFACE DRAINAGE

- A. Subdrainage Pipe: Specified in Division 33 Section "Storm Drainage."
- B. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches x12 inches of filter material, placed in compacted layers 6 inches thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches.
 - 1. Compact each filter material layer to 90 percent of maximum dry unit weight
- C. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches of final subgrade, in compacted layers 6 inches thick. Overlay drainage backfill with one layer of subsurface drainage geotextile, overlapping

sides and ends at least 6 inches.

1. Compact each filter material layer to 90 percent of maximum dry unit weight.
2. Place and compact impervious fill over drainage backfill in 6-inch thick compacted layers to final subgrade.

3.20 BASE COURSES UNDER PAVEMENTS AND WALKS

- A. Place base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place base course under pavements and walks as follows:
 1. Compact base courses at optimum moisture content to required grades, lines, cross sections and thickness to not less than 95 percent of ASTM D 4254 relative density.
 2. Shape base to required crown elevations and cross-slope grades.
 3. When thickness of compacted base course is 6 inches or less, place materials in a single layer.
 4. When thickness of compacted base course exceeds 6 inches, place materials in equal layers, with no layer more than 6 inches thick or less than 3 inches thick when compacted.

3.21 PAVEMENT REPAIR

- A. Repair or patch asphalt pavement as specified in Section 321216 ASPHALTIC CONCRETE PAVING. Repair or patch concrete pavement, curbs and gutters as specified in Section 321313 PORTLAND CEMENT CONCRETE PAVING. Do not repair pavement until trench has been backfilled and compacted as herein specified. As a minimum, maintain one-way traffic on roads and streets crossed by trenches.

3.22 FIELD QUALITY CONTROL

- A. Testing Agency Services: Allow testing agency to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed work verify compliance with requirements.
 1. Perform field in-place density tests according to ASTM D 1556 (sand cone method), ASTM D 2167 (rubber balloon method), or ASTM D 2937 (drive cylinder method), as applicable.
 - a. Field in-place density tests may also be performed by the nuclear method according to ASTM D 2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using

ASTM D 1556. With each density calibration check, check the calibration curves furnished with the moisture gages according to ASTM D 3017

- b. When field in-place density tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the Architect.
- B. 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.
- C. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, perform at least one field in-place density test for every 2,000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
- D. Foundation Wall Backfill: In each compacted backfill layer, perform at least one field in-place density test for each 100 feet or less of wall length, but no fewer than two tests along a wall face.
- E. Trench Backfill: In each compacted initial and final backfill layer, perform at least one field in- place density test for each 150 feet or less of trench, 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.

3.23 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 at optimum moisture content to the required density.
- 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.

3.24 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.
- B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.
 - 1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 31 20 00

SECTION 32 13 13 – SITE CONCRETE PAVING**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Driveways.
 - 2. Curbs and gutters.
 - 3. Walks.
 - 4. Mow Curbs.
 - 5. Play Area Curbs.
 - 6. Pedestrian Ramps.
- B. Related Requirements:
 - 1. Section 321373 "Concrete Paving Joint Sealants".

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash, slag cement, and other pozzolans.
- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. 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. Contractor shall provide a minimum of three 48"x48" sample of the Decorative PCC pavement for review and approval by City representative prior to performing the work.

- D. A Sawcut and/or joint layout shall be submitted by the Contractor to the owner for acceptance prior to placement of any concrete associated with this project.

1.5 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For the following, from manufacturer:
 - 1. Cementitious materials.
 - 2. Steel reinforcement and reinforcement accessories.
 - 3. Admixtures.
 - 4. Curing compounds.
 - 5. Applied finish materials.
 - 6. Bonding agent or epoxy adhesive.
 - 7. Joint fillers.
- B. Material Test Reports: For each of the following:
 - 1. Aggregates:
- C. Field quality-control reports.

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.
- B. Mockups: Build mockups to verify selections made under Sample submittals and to set quality standards for materials and execution.
 - 1. Build mockups for colored concrete and colored concrete with aggregate finish.
 - a. Size: 48 inches by 48 inches
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 FIELD CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

- B. Cold-Weather Concrete 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, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
 - 2. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.
- C. Hot-Weather Concrete Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:
 - 1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F 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.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with ACI 301 unless otherwise indicated.

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 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. Deformed-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, flat sheet.
- B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.
- C. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 plain-steel bars. Cut bars true to length with ends square and free of burrs.

2.4 CONCRETE MATERIALS

- A. Cementitious Materials: Use the following cementitious materials, of same type, brand, and source throughout Project:
 - 1. Portland Cement: ASTM C 150, gray Portland cement Type II.
 - 2. Fly Ash: ASTM C 618,
 - 3. Slag Cement: ASTM C 989, Grade 100 or 120.
- B. Normal-Weight Aggregates: ASTM C 33/C 33M, 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 nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
 - 3. Aggregate Sizes: 3/4 to 1-inch nominal.
- C. Air-Entraining Admixture: ASTM C 260.
- D. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain no 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.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.5 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182.
- 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.

2.6 RELATED MATERIALS

- A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber in preformed strips.
- B. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- C. Epoxy-Bonding Adhesive: ASTM C 881/C 881M, two-component epoxy resin capable of humid curing and bonding to damp surfaces; of class suitable for application temperature, of grade complying with requirements, and of the following types:

2.7 CONCRETE MIXTURES

- A. Prepare design mixtures, proportioned according to ACI 301, 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.
- B. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.
- C. Concrete Mixtures: Normal-weight concrete.
 - 1. Maximum W/C Ratio at Point of Placement: 0.45.
 - 2. Slump Limit: 4 inches.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. 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.

3.4 STEEL REINFORCEMENT INSTALLATION

- 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.

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. Doweled Joints: Install dowel bars and support assemblies at joints where indicated.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

- a. Locate expansion joints as indicated on the plans.
 2. Extend joint fillers full width and depth of joint.
 3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
 4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
 5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
 6. 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.
- D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated.
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/8-inch radius.
 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.
 3. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated.
- E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/8-inch radius.

3.6 CONCRETE PLACEMENT

- A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.
- B. 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.
- C. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.
- D. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.
- E. 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.

- F. Consolidate concrete according to ACI 301 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.
- G. Screed paving surface with a straightedge and strike off.
- H. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleedwater appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
- I. Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.

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 bleedwater 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.

3.8 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 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.

3.9 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Testing Services: Testing and inspecting of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to the following requirements:
 - 1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. 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/C 231M, 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 and below and when it is 80 deg F 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.
- C. 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.
- D. 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.

- E. 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.
- F. 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.
- G. Concrete paving will be considered defective if it does not pass tests and inspections.
- H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- I. Prepare test and inspection reports.

3.10 REPAIR 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. 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.
- C. 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 32 13 13

SECTION 32 13 73 - CONCRETE PAVING JOINT SEALANTS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- C. Paving-Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of joint sealant and accessory.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Product Testing: Test joint sealants using a qualified testing agency.

1.5 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 - 2. When joint substrates are wet.

3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

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

2.2 COLD-APPLIED JOINT SEALANTS

- A. Single-Component, Nonsag, Silicone Joint Sealant: ASTM D 5893/D 5893M, Type NS.
- B. Single-Component, Self-Leveling, Silicone Joint Sealant: ASTM D 5893/D 5893M, Type SL.
- C. Multicomponent, Nonsag, Urethane, Elastomeric Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25, for Use T.
- D. Single Component, Pourable, Urethane, Elastomeric Joint Sealant: ASTM C 920, Type S, Grade P, Class 25, for Use T.
- E. Multicomponent, Pourable, Urethane, Elastomeric Joint Sealant: ASTM C 920, Type M, Grade P, Class 25, for Use T.

2.3 JOINT-SEALANT BACKER MATERIALS

- A. Joint-Sealant Backer Materials: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by joint-sealant manufacturer, based on field experience and laboratory testing.
- B. Round Backer Rods for Cold- and Hot-Applied Joint Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.
- C. Round Backer Rods for Cold-Applied Joint Sealants: ASTM D 5249, Type 3, of diameter and density required to control joint-sealant depth and prevent bottom-side adhesion of sealant.
- D. Backer Strips for Cold- and Hot-Applied Joint Sealants: ASTM D 5249; Type 2; of thickness and width required to control joint-sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine joints to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Before installing joint sealants, clean out joints immediately to comply with joint-sealant manufacturer's written instructions.
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

3.3 INSTALLATION OF JOINT SEALANTS

- A. Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.
- B. Joint-Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions.
- C. Install joint-sealant backings to support joint sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of joint-sealant backings.
 - 2. Do not stretch, twist, puncture, or tear joint-sealant backings.
 - 3. Remove absorbent joint-sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install joint sealants immediately following backing installation, using proven techniques that comply with the following:
 - 1. Place joint sealants so they fully contact joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Joint Sealants: Immediately after joint-sealant application and before skinning or curing begins, tool sealants according to the following

requirements to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint:

1. Remove excess joint sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.
- F. Provide joint configuration to comply with joint-sealant manufacturer's written instructions unless otherwise indicated.

3.4 CLEANING AND PROTECTION

- A. Clean off excess joint sealant as the Work progresses, by methods and with cleaning materials approved in writing by joint-sealant manufacturers.
- B. Protect joint sealants, during and after curing period, from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations in repaired areas are indistinguishable from the original work.

3.5 PAVING-JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Joints within concrete paving.
1. Joint Location:
 - a. Expansion and isolation joints in concrete paving.
 2. Joint-Sealant Color: Match adjacent paving.

END OF SECTION 32 13 73

SECTION 32 18 16.13 - PLAYGROUND PROTECTIVE SURFACING**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Unitary, seamless surfacing (Rubberized Play Surfacing).

1.3 REFERENCES

- A. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.
- B. ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
- C. ASTM D2047 Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine.
- D. ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials.
- E. ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.
- F. 6. ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment.
- G. ASTM F1951 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment.

1.4 DEFINITIONS

- A. Definitions in ASTM F 2223 apply to Work of this Section.
- B. Critical Height: Standard measure of shock attenuation according to ASTM F 2223; same as "critical fall height" in ASTM F 1292. According to ASTM F 1292, this approximates "the maximum fall height from which a life-threatening head injury would not be expected to occur."
- C. SBR: Styrene-butadiene rubber.

- D. Unitary Surfacing: A protective surfacing of one or more material components bound together to form a continuous surface; same as "unitary system" in ASTM F 2223.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of protective surfacing.
 - 1. Include fall heights and use zones for equipment and structures specified in Section 116800 " Exercise Equipment" coordinated with the critical heights for protective surfacing.
- C. Samples for Initial Selection: For each type of exposed finish.
 - 1. Include Samples of accessories involving color selection.
- D. Samples for Verification: For each type of protective surfacing and exposed finish.
 - 1. Include Samples of accessories to verify color and finish selection.
 - a. Rubberized Play Surfacing: Minimum 9 by 9 inches.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installer and testing agency.
- B. Material Certificates: For each type of loose-fill surfacing.
- C. Product Certificates: For each type of unitary surfacing product.
- D. Field quality-control reports.
- E. Sample Warranty: For manufacturer's special warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For playground protective surfacing to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: Utilize an installer approved and trained by the manufacturer of the playground surfacing system, having experience with other projects of the scope and scale of the work described in this section.
- B. Certifications: Certification by manufacturer that installer is an approved applicator of the playground surfacing system.
- C. International Play Equipment Manufacturers Association (IPEMA) certified.

- D. Mockups: Build mockups to verify selections made under Sample submittals and to set quality standards for materials and execution.
 - 1. Build mockups for protective surfacing including accessories.
 - a. Size: 48 inches by 48 inches
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE & HANDLING

- A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- B. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at a minimum temperature of 40 degrees F (4 degrees C) and a maximum temperature of 90 degrees F.

1.10 PROJECT/SITE CONDITIONS

- A. Environmental Requirements: Install surfacing system when minimum ambient temperature is 40 degrees F and maximum ambient temperature is 90 degrees F. Do not install in steady or heavy rain.

1.11 WARRANTY

- A. Special Warranty: Manufacturer and Installer agree to repair or replace components of protective surfacing that fail in materials or workmanship within specified warranty period.
- B. 1 Failures include, but are not limited to the following:
 - a. Reduction in impact attenuation as measured by reduction of critical fall height.
 - b. Deterioration of protective surfacing and other materials beyond normal weathering
- C. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
- D. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under contract documents.
- E. Proper drainage is critical to the longevity of the surfacing system.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. Rubberized Play Surfacing shall be by Surface America (1-800-999-0555) or approved equal.

2.2 PERFORMANCE REQUIREMENTS

- A. Performance Requirements: Provide a 2-layer rubber-urethane playground surfacing system which has been designed, manufactured and installed to meet the following criteria:
 - 1. Shock Attenuation (ASTM F1292):
 - a. Gmax: Less than 200.
 - b. Head Injury Criteria: Less than 1000.
 - 2. Flammability (ASTM D2859): Pass.
 - 3. Tensile Strength (ASTM D412): 60 psi (413 kPa).
 - 4. Tear Resistance (ASTM D624): 140%.
 - 5. Water Permeability: 0.4 gal/yd²/second.
 - 6. Accessibility: Comply with requirements of ASTM F1951.

2.3 RUBBERIZED PLAY SURFACING

- A. Poured-In-Place Primer
 - 1. Material: Aliphatic Urethane Binder
- B. Poured-In-Place Basemat
 - 1. Material: Blend of 100% recycled SBR (styrene butadiene rubber) and urethane.
 - 2. Thickness: 1 1/4" for 4' critical fall height, 2" for 5' critical fall height, 2 1/2" for 6' and 7' critical fall heights, 3" for 8' critical fall height, 3 1/2" for 9' critical fall height, 4" for 10' critical fall height, 5" for 12' critical fall height, 6" for 13' critical fall height.
 - 3. Formulation Components: Blend of strand and granular material.
- C. Poured-In-Place Top Surface
 - 1. Material: Blend of recycled EPDM (ethylene propylene diene monomer) rubber and aromatic or aliphatic urethane binder.

2. Thickness: Nominal 1/2", minimum 3/8", maximum 5/8".
 3. Color: 50% Black granules, 50% Brown granules
- D. Mixes
1. Required mix proportions by weight:
 - a. Basemat: 16+% urethane (as ratio: 14% urethane divided by 86% rubber). 14% urethane, 86% rubber (based on entire rubber & urethane mix).
 - b. Top Surface: 22% urethane (ratio: 18% urethane divided by 82% rubber). 18% urethane, 82% rubber (based on entire rubber & urethane mix).

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- A. Comply with the instructions and recommendations of the playground surfacing manufacturer.

3.2 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for subgrade elevations, slope, and drainage and for other conditions affecting performance of the Work.
 1. Verify that substrates are sound and without high spots, ridges, holes, and depressions.

3.3 INSTALLATION OF GEOSYNTHETIC ACCESSORIES

- A. Install geosynthetic accessories before edging and according to playground surface system manufacturer's and geosynthetic manufacturer's written instructions and in a manner that cannot become a tripping hazard.
 1. Drainage/Separation Geotextile: Completely cover area beneath protective surfacing, overlapping geotextile sides and edges a minimum of 4 inches with manufacturer's standard treatment for seams.

3.4 INSTALLATION OF SEAMLESS SURFACING

- A. Do not proceed with playground surfacing installation until all applicable site work, including substrate preparation, fencing, playground equipment installation and other relevant work, has been completed.
- B. Surface Preparation: Using a brush or short nap roller, apply primer to the substrate perimeter and any adjacent vertical barriers such as playground equipment support legs, curbs or slabs that will contact the surfacing system at the rate of 300 ft²/gal.

C. Basemat Installation:

1. Using screeds and hand trowels, install the basemat at a consistent density of 29 pounds, 1 ounce per cubic foot to the specified thickness.
2. Install to the manufacturer's minimum thickness or greater as required by the fall heights of the playground equipment.
3. Allow basemat to cure for sufficient time so that indentations are not left in the basemat from applicator foot traffic or equipment.
4. Do not allow foot traffic or use of the basemat surface until it is sufficiently cured.

D. Primer Application: Using a brush or short nap roller, apply primer to the basemat perimeter and any adjacent vertical barriers such as playground equipment support legs, curbs or slabs that will contact the surfacing system at the rate of 300 ft²/gal.

E. Top Surface Installation:

1. Using a hand trowel, install top surface at a consistent density of 58 pounds, 9 ounces per cubic foot to a nominal thickness of 1/2".
2. Allow top surface to cure for a minimum of 48 hours.
3. At the end of the minimum curing period, verify that the top surface is sufficiently dry and firm to allow foot traffic and use without damage to the surface.
4. Do not allow foot traffic or use of the surface until it is sufficiently cured.

3.5 INSTALLATION OF LOOSE-FILL SURFACING

- A. Apply components of loose-fill surfacing according to manufacturer's written instructions to produce a uniform surface.
- B. Loose Fill: Place loose-fill materials to required depth after installation of playground equipment support posts and foundations. Include manufacturer's recommended amount of additional material to offset mechanical compaction.
- C. Stabilizing Mats: Coordinate installation of mats and mat anchoring system with placing and compacting loose fill.
- D. Grading: Uniformly grade loose fill to an even surface free from irregularities.
- E. Compaction: After initial grading, mechanically compact loose fill before finish grading.
- F. Finish Grading: Hand rake to a uniformly smooth finished surface and to required elevations.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor shall engage a qualified testing agency to perform tests.
- B. Perform the following tests with the assistance of a factory-authorized service representative:
 - 1. Perform "Installed Surface Performance Test" according to ASTM F 1292 for each protective surfacing type and thickness in each playground area.
- C. Playground protective surfacing will be considered defective if it does not pass tests.
- D. Prepare test reports.

3.7 PROTECTION

- A. Prevent traffic over seamless surfacing for not less than 48 hours after installation.

END OF SECTION 32 18 16.13

SECTION 32 84 00 - PLANTING IRRIGATION**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Piping.
 - 2. Pressure-reducing valves.
 - 3. Automatic control valves.
 - 4. Sprinklers.
 - 5. Quick couplers.
 - 6. Drip irrigation specialties.
 - 7. Controllers.
 - 8. Boxes for automatic control valves.
- B. Related Sections:
 - 1. Section 329113 "Soil Preparation".
 - 2. Section 329200 "Turf and Grasses".
 - 3. Section 329300 "Plants".

1.3 DEFINITIONS

- A. Circuit Piping: Downstream from control valves to sprinklers, specialties, and drain valves. Piping is under pressure during flow.
- B. ET Controllers: EvapoTranspiration Controllers. Irrigation controllers which use some method of weather based adjustment of irrigation. These adjusting methods include use of historical monthly averages of ET; broadcasting of ET measurements; or use of on-site sensors to track ET.
- C. Main Piping: Downstream from point of connection to water distribution piping to, and including, control valves. Piping is under water-distribution-system pressure.

- D. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.

1.4 PERFORMANCE REQUIREMENTS

- A. Irrigation zone control shall be automatic operation with controller and automatic control valves.
- B. Location of Sprinklers and Specialties: Design location is approximate. Make minor adjustments necessary to avoid plantings and obstructions such as signs and light standards. Maintain 100 percent irrigation coverage of areas indicated.
- C. Minimum Working Pressures: The following are minimum pressure requirements for piping, valves, and specialties unless otherwise indicated:
 - 1. Irrigation Main Piping: 200 PSI.

1.5 2. CIRCUIT PIPING: 150 PSI.ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristic, and furnished specialties and accessories.
- B. Wiring Diagrams: For power, signal, and control wiring.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Zoning Chart: Show each irrigation zone and its control valve.
- C. Controller Timing Schedule: Indicate timing settings for each automatic controller zone.
- D. Field quality-control reports.

1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For sprinklers, drip tubing, controllers, and automatic control valves to include in operation and maintenance manuals.
- B. Guarantee: In addition to manufacturers' specific warranties, warrant the entire irrigation system for a period of one year from date of generally substantial completion. The entire sprinkler system, including all work done under this contract, shall be unconditionally guaranteed against all defects and fault of material and workmanship, including settling of backfilled areas below grade, for a period of one (1) year following the filing of the Notice of Completion.

Should any problem with the irrigation system be discovered within the guarantee period, that problem shall be corrected by the Contractor at no additional expense to City within ten (10) calendar days of receipt of written notice from City. When the nature of the repairs as determined by the City constitute an emergency (i.e. broken pressure line) the City may proceed to make repairs at

the Contractor's expense. All damages to existing improvement resulting either from faulty materials or workmanship, or from the necessary repairs to correct same, shall be repaired to the satisfaction of the City by the Contractor, all at no additional cost to the City.

At Contractor's expense, promptly repair all damage to paving, planting and other components that are due to settlement of improperly compacted trench soil.

Guarantee shall be submitted on Contractor's own letterhead as follows:

GUARANTEE FOR SPRINKLER IRRIGATION SYSTEM

We hereby guarantee that the sprinkler irrigation system we have furnished and installed 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 excepted. We agree to repair or replace any defective material during the period of one year from date of filing of the Notice of Completion 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 10 calendar days following written notification by the City. In the event of our failure to make such repairs or replacements within the time specified after receipt of written notice from City, we authorize the City to proceed to have said repairs or replacements made at our expense and we will pay the costs and charges therefore upon demand.

Project Name:

Project Location:

Contractor Name:

Address:

Telephone:

Signed:

Date:

- C. Record Drawings: The Contractor shall prepare record drawings that show all changes in the work constituting departures from the original contract drawings, including those involving both constant-pressure and intermittent-pressure lines and appurtenances. The Contractor shall accurately record, on a daily basis, on one set of blue line prints of the irrigation drawings, all changes in work constituting departures from the original contract drawings, including changes in both pressure and nonpressure line. The Contractor shall post information on record drawings no later than the next working day after the work is installed. The Contractor shall record changes and dimensions in a legible and professional manner. When the drawings are approved by the Engineer the Contractor shall transfer all information to a set of reproducible photo mylar drawings. Items required to be shown shall be dimensioned by the Contractor from two permanent points of reference (buildings, monuments, sidewalks, curbs, pavement). The accuracy of location of all items to be shown on the drawings shall be 150 mm (6") in both the vertical and horizontal planes. All text and numerals placed on drawings shall be 0.30 mm (1/8") in size. Facilities and items to be located in their horizontal and vertical positions and shown on the record drawings include all:

1. Point(s) of connection, for water and electrical services
2. Routing of irrigation pressure mainlines
3. Ball, gate and check valves
4. Irrigation control valves
5. Quick coupler valves
6. Routing of service wires
7. Routing of control wires
8. Electrical service equipment
9. Electrical junction boxes
10. Other equipment of a similar nature (as directed by the Owner or Engineer of work).

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Contractor shall provide the following items to the Owner:

1. Two control valve keys.
2. Two wrenches for removing each different type of sprinkler head.
3. Two quick coupler keys. The keys and hose ells shall be of the same manufacturer as the coupling valve.
4. Five keys for opening and locking each automatic controller and enclosure.

B. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Spray sprinklers: equal to 5 percent of amount installed for each type and size indicated, but no fewer than 5 units.
2. Bubblers: equal to 5 percent of amount installed for each type indicated, but no fewer than 5 units.
3. Emitters: equal to 5 percent of amount installed for each type indicated, but no fewer than 5 units.
4. Drip-tube system tubing: equal to 5 percent of total length installed for each type and size indicated, but not less than 100 feet.
5. Rotors: equal to 5 percent of amount installed for each type and size indicated, but no fewer than 5 units.

1.9 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- B. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.11 PROJECT CONDITIONS

- A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:
 - 1. Notify Construction Manager at least one week in advance of proposed interruption of water service.
 - 2. Do not proceed with interruption of water service without Construction Manager's written permission.

PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

- A. Comply with requirements in the piping schedule for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.
- B. PVC Pipe: ASTM D 1785, PVC 1120 compound, per Plans.
 - 1. PVC Socket Fittings: ASTM D 2466, Schedule 80.
 - 2. PVC Threaded Fittings: ASTM D 2464, Schedule 80.

2.2 PIPING JOINING MATERIALS

- A. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

2.3 WARNING TAPE

- A. The plastic warning tape shall be prepared with silver printing on a purple field having the words, "CAUTION: RECLAIMED WATER LINE BELOW". The overall width shall be 3 inches and installed 3" above the pipe.

2.4 AUTOMATIC CONTROL VALVES

A. Bronze, Automatic Control Valves:

1. Description: Cast-bronze body, normally closed, diaphragm type with manual-flow adjustment, and operated by 24-V ac solenoid.

B. Plastic, Automatic Control Valves:

1. Description: Molded-plastic body, normally closed, diaphragm type with manual-flow adjustment, and operated by 24-V ac solenoid.

2.5 WARNING LABELS AND TAGS

- ### A.
- Use T. Christy's riser markers, with "RECLAIMED WATER - DO NOT DRINK" in English and Spanish, for all reclaimed water sprinkler risers installed.

- ### B.
- Use T. Christy's I.D. Tags with "WARNING - RECLAIMED WATER DO NOT DRINK" in English and Spanish for all reclaimed water remote control valves.

2.6 SPRINKLERS

- ### A.
- General Requirements: Designed for uniform coverage over entire spray area indicated at available water pressure.

B. Plastic, Pop-up, Gear-Drive Rotary Sprinklers:

1. Description: per Plans.

2.7 QUICK COUPLERS

- ### A.
- Description: Factory-fabricated, brass, two-piece assembly. Include coupler water-seal valve; removable upper body with spring-loaded or weighted, rubber-covered cap; hose swivel with ASME B1.20.7, 3/4-11.5NH threads for garden hose on outlet; and operating key.

1. Locking-Top Option: Vandal-resistant locking feature. Include two matching key(s).

2.8 DRIP IRRIGATION SPECIALTIES

A. Drip Tubes with Direct-Attached Emitters:

1. Tubing: Flexible PE or PVC with plugged end.
2. Emitters: per Plans
 - a. Body Material: PE or vinyl, with flow control.
 - b. Mounting: Inserted into tubing at set intervals.

2.9 CONTROLLERS

A. Description:

1. Controller Stations for Automatic Control Valves: per Plans.
2. Concrete Base: Reinforced precast concrete not less than 36 by 24 by 4 inches thick, and 6 inches greater in each direction than overall dimensions of controller. Include opening for wiring.

2.10 BOXES FOR AUTOMATIC CONTROL VALVES

A. Plastic Boxes:

1. Carson Industries, LLC or approved equal.
2. Description: Box and cover, with open bottom and openings for piping; designed for installing flush with grade.
 - a. Size: As required for valves and service.
 - b. Shape: Rectangular.
 - c. Sidewall Material: PE.
 - d. Cover Material: PE.
 - 1) Lettering: Valve boxes shall have identification numbers hot branded onto the box covers. The letters shall be 2" high and shall be branded using irons specifically designed for this purpose. Heat branding shall not weaken or in any way puncture the valve box cover. Remote control valves shall be branded "RCV" followed by the irrigation controller and valve number (e.g. RCV A-12), ball valves shall be branded "BV", and quick coupler valves shall be branded "QCV".

- ### B. Drainage Backfill: Cleaned gravel or crushed stone, graded from 4-inch minimum depth.

PART 3 - EXECUTION

3.1 EARTHWORK

- #### A. Install warning tape directly above pressure piping, 12 inches below finished grades, except 6 inches below subgrade under pavement and slabs.
- #### B. Provide minimum cover over top of underground piping per Plans.
1. Irrigation Main Piping: Minimum depth of 24 inches below finished grade, or not less than 18 inches below average local frost depth, whichever is deeper.
 2. Circuit Piping: 18 inches below finished grade, 24" under pavement.
 3. Sleeves: 24 inches.

3.2 PREPARATION

- A. Set stakes to identify locations of proposed irrigation system. Obtain Architect's approval before excavation.

3.3 PIPING INSTALLATION

- A. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved on Coordination Drawings.
- B. Install piping at minimum uniform slope of 0.5 percent down toward drain valves.
- C. Install piping free of sags and bends.
- D. Install groups of pipes parallel to each other, spaced to permit valve servicing.
- E. Install fittings for changes in direction and branch connections.
- F. Install expansion loops in control-valve boxes for plastic piping.
- G. Lay piping on solid subbase, uniformly sloped without humps or depressions.
- H. Install PVC piping in dry weather when temperature is above 40 deg F. Allow joints to cure at least 24 hours at temperatures above 40 deg F before testing.
- I. Install piping in sleeves under parking lots, roadways, and sidewalks.
- J. Install sleeves made of Schedule 40 PVC pipe and socket fittings, and solvent-cemented joints.

3.4 JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

3.5 SPRINKLER INSTALLATION

- A. Install sprinklers after hydrostatic test is completed.
- B. Install sprinklers at manufacturer's recommended heights.
- C. Locate part-circle sprinklers to maintain a minimum distance of 12 inches from walls and from other boundaries unless otherwise indicated.

3.6 DRIP IRRIGATION SPECIALTY INSTALLATION

- A. Install drip tubes with direct-attached emitters on ground.

- B. Install air relief valves and vacuum relief valves in piping, and in control-valve boxes.

3.7 AUTOMATIC IRRIGATION-CONTROL SYSTEM INSTALLATION

- A. Equipment Mounting: Install exterior freestanding controllers on concrete bases.
 - 1. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
- B. Install control cable in same trench as irrigation piping and at least 2 inches below piping. Provide conductors of size not smaller than recommended by controller manufacturer. Install cable in separate sleeve under paved areas.

3.8 FIELD QUALITY CONTROL

- A. Perform tests and inspections. The Contractor shall permit the City's authorized representative to visit and inspect at all times any part of the work and shall provide safe access for such visits.

Where the specifications require work to be tested by the Contractor, it shall not be covered over until accepted by the City's authorized representative, and/or governing agencies. The Contractor shall be solely responsible for notifying the, City, and governing agencies, a minimum of 48 hours in advance, where and when the work is ready for testing. Should any work be covered without testing or acceptance, it shall be, if so ordered, uncovered at the Contractor's expense.

- B. Tests and Inspections:
 - 1. System layout.
 - 2. Pressure test of irrigation mainline (Four hours at 125 PSI or 120% of static water pressure, whichever is greater.) Mainline pressure loss during test shall not exceed 2 PSI.
 - 3. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
 - 4. Coverage test of irrigation system. Test shall be performed prior to any planting.
 - 5. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - 6. Final inspections prior to start of maintenance period.
 - 7. Final acceptance.

- C. Any irrigation product will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

3.9 ADJUSTING

- A. Adjust settings of controllers.
- B. Adjust automatic control valves to provide flow rate at rated operating pressure required for each sprinkler circuit.
- C. Adjust sprinklers and devices, except those intended to be mounted aboveground, so they will be flush with finish grade.

3.10 CLEANING

- A. Flush dirt and debris from piping before installing sprinklers and other devices.

3.11 PIPING SCHEDULE

- A. Install components having pressure rating equal to or greater than system operating pressure.
- B. Underground irrigation main piping shall be per the Plans.
- C. Circuit piping shall be per the Plans.
- D. Underground Branches and Offsets at Sprinklers and Devices: Schedule 80, PVC pipe; threaded PVC fittings; and threaded joints.
 - 1. Option: Plastic swing-joint assemblies, with offsets for flexible joints, manufactured for this application.

END OF SECTION 32 84 00

SECTION 32 91 13 - SOIL PREPARATION**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes planting soils specified by composition of the mixes.
- B. Related Requirements:
 - 1. Section 328400 "Planting Irrigation".
 - 2. Section 329200 "Turf and Grasses".
 - 3. Section 329300 "Plants".

1.3 DEFINITIONS

- A. Backfill: The earth used to replace or the act of replacing earth in an excavation. This can be amended or unamended soil as indicated.
- B. CEC: Cation exchange capacity
- C. Compost: The product resulting from the controlled biological decomposition of organic material that has been sanitized through the generation of heat and stabilized to the point that it is beneficial to plant growth.
- D. Duff Layer: A surface layer of soil, typical of forested areas, that is composed of mostly decayed leaves, twigs, and detritus.
- E. Imported Soil: Soil that is transported to Project site for use.
- F. Manufactured Soil: Soil produced by blending soils, sand, stabilized organic soil amendments, and other materials to produce planting soil.
- G. Organic Matter: The total of organic materials in soil exclusive of undecayed plant and animal tissues, their partial decomposition products, and the soil biomass; also called "humus" or "soil organic matter."
- H. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified as specified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- I. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

- J. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.
- K. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil"; but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at the Project site.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include recommendations for application and use.
 - 2. Include test data substantiating that products comply with requirements.
 - 3. Include sieve analyses for aggregate materials.
 - 4. Material Certificates: For each type of imported soil, soil amendment, and fertilizer before delivery to the site.
- B. Samples: For each bulk-supplied material, 1-quart volume of each in sealed containers labeled with content, source, and date obtained. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of composition, color, and texture.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For each testing agency.
- B. Preconstruction Test Reports: For preconstruction soil analyses specified in "Preconstruction Testing" Article.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent, state-operated; experienced in soil science, soil testing, and plant nutrition; with the experience and capability to conduct the testing indicated; and that specializes in types of tests to be performed.
 - 1. Laboratories: Subject to compliance with requirements, provide testing by the following or approved equal:
 - a. Wallace Laboratories
365 Coral Circle
El Segundo, CA 90245
Phone: 310-615-0116

- b. Waypoint Analytical
4741 E. Hunter Ave. Ste A
Anaheim, CA 92807
Phone: 714-282-8777
- c. SiteOne Landscape Supply
2120 La Mirada Dr.
Vista, CA 92081
Phone: 760-734-4334

1.8 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction soil analyses on existing, on-site soil.
- B. Preconstruction Soil Analyses: For each unamended soil type, perform testing on soil samples and furnish soil analysis and a written report containing soil-amendment and fertilizer recommendations by a qualified testing agency performing the testing according to "Soil-Sampling Requirements" and "Testing Requirements" articles.
 - 1. Have testing agency identify and label samples and test reports according to sample collection and labeling requirements.

1.9 SOIL-SAMPLING REQUIREMENTS

- A. General: Extract soil samples according to requirements in this article.
- B. Sample Collection and Labeling: Have samples taken and labeled by the Contractor to provide an Agricultural Soil Suitability Report from a State Certified Agronomic Soil Testing Laboratory for all planting areas to determine soil fertility and required nutrient needs. All test results and recommendations shall be provided to the City. The soil report recommendations shall be incorporated at the Contractor's expense.
 - 1. Number and Location of Samples: Minimum of two representative soil samples from varied locations where directed by the City for each soil to be used or amended for landscaping purposes.
 - 2. Procedures and Depth of Samples: Samples are to be taken from the top 6" of soil in areas to receive planting.
 - 3. Labeling: Label each sample with the date, location keyed to a site plan or other location system, visible soil condition, and sampling depth.

1.10 TESTING REQUIREMENTS

- A. General: Perform tests on soil samples according to requirements in this article.
- B. Physical Testing:

1. Soil Texture: Soil-particle, size-distribution analysis.
 2. Total Porosity: Calculate using particle density and bulk density.
 3. Water Retention: According to SSSA's "Methods of Soil Analysis - Part 1- Physical and Mineralogical Methods."
- C. Chemical Testing:
1. Analysis by sodium saturation at pH 7/
 2. Phytotoxicity: Test for plant-available concentrations of phytotoxic minerals including aluminum, arsenic, barium, cadmium, chlorides, chromium, cobalt, copper, lead, lithium, mercury, nickel, selenium, silver, sodium, strontium, tin, titanium, vanadium, and zinc.
- D. Fertility Testing: Soil-fertility analysis, including the following:
1. Percentage of organic matter.
 2. CEC, calcium percent of CEC, and magnesium percent of CEC.
 3. Soil reaction (acidity/alkalinity pH value).
 4. Buffered acidity or alkalinity.
 5. Nitrogen ppm.
 6. Phosphorous ppm.
 7. Potassium ppm.
 8. Manganese ppm.
 9. Manganese-availability ppm.
 10. Zinc ppm.
 11. Zinc availability ppm.
 12. Copper ppm.
 13. Sodium ppm and sodium absorption ratio.
 14. Soluble-salts ppm.
 15. Presence and quantities of problem materials including salts and metals cited in the Standard protocol. If such problem materials are present, provide additional recommendations for corrective action.
 16. Other deleterious materials, including their characteristics and content of each.
- E. Organic-Matter Content: Analysis.
- F. Recommendations: Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated to produce satisfactory planting soil suitable for healthy, viable plants indicated. Include, at a minimum, recommendations for nitrogen, phosphorous, and potassium fertilization, and for micronutrients.
1. Fertilizers and Soil Amendment Rates: State recommendations in weight per 1000 sq. ft.

2. Soil Reaction: State the recommended liming rates for raising pH or sulfur for lowering pH according to the buffered acidity or buffered alkalinity in weight per 1000 sq. ft.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and compliance with state and Federal laws if applicable.
- B. Bulk Materials:
 1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 3. Do not move or handle materials when they are wet or frozen.
 4. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

PART 2 - PRODUCTS

2.1 PLANTING SOILS SPECIFIED BY COMPOSITION

- A. General: Soil amendments, fertilizers, and rates of application shall be based on testing laboratory's recommendations after preconstruction soil analyses are performed.
- B. Planting-Soil Type: Existing, on-site surface soil, with the duff layer, if any, retained and stockpiled on-site; modified to produce viable planting soil. Blend existing, on-site surface soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:
 1. Bid mix for turf and shrub areas. Soil amendments bid mix shall be the following per 1000 square feet:
 - a. 6 cu. Yds. Nitrogen stabilized organic amendment 'Humic Compost' by Agriservice or approved equal.
 - b. 40 lbs. Gro-power Plus
 - c. 100 lbs. Gypsum
 2. Planting and backfill mix for planting pits and tablets shall be as follows per cubic yard:
 - a. 70% of native soil

- b. 30% Nitrogen stabilized organic amendment 'Humic Compost' by Agriservice or approved equal.
 - c. 16 lbs. Gro-power Plus
 - d. 2 lbs. Ferrous Sulfate
- 3. Unacceptable Properties: Manufactured soil shall not contain the following:
 - a. Unacceptable Materials: Concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
 - b. Unsuitable Materials: Stones, roots, plants, sod, clay lumps, and pockets of coarse sand that exceed a combined maximum of 5 percent by dry weight of the manufactured soil.
 - c. Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding 1-1/2 inches in any dimension.

2.2 INORGANIC SOIL AMENDMENTS

- A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:
 - 1. Class: T, with a minimum of 99 percent passing through a No. 8 sieve and a minimum of 75 percent passing through a No. 60 sieve.
 - 2. Class: O, with a minimum of 95 percent passing through a No. 8 sieve and a minimum of 55 percent passing through a No. 60 sieve.
- B. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent elemental sulfur, with a minimum of 99 percent passing through a No. 6 sieve and a maximum of 10 percent passing through a No. 40 sieve.
- C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
- D. Perlite: Horticultural perlite, soil amendment grade.
- E. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through a No. 50 sieve.
- F. Sand: Clean, washed, natural or manufactured, free of toxic materials, and according to ASTM C 33/.

2.3 ORGANIC SOIL AMENDMENTS

- A. Compost: The compost used must not be derived from mixed municipal solid waste and must be reasonably free of visible contaminants. The compost must not contain paint, petroleum products, pesticides, or any other chemical residues

harmful to animal life or plant growth (less than 1% by dry weight basis). The compost must not possess objectionable odors. The compost shall have a grain size distribution where 98% is passing the 3/4" sieve and less than 25% passing the 3/8" sieve. The compost shall not have any materials larger than the 2" in length. The compost shall also meet the following requirements:

1. pH: 5.5-8.0
2. Moisture: 30-60% wet weight basis
3. Organic Matter: 30-65% dry weight basis
4. Stability (Carbon Dioxide evolution rate): >80% relative to positive control
5. Maturity (Seed emergence and seedling vigor): >80% relative to positive control.

2.4 FERTILIZERS

- A. Superphosphate: Commercial, phosphate mixture, soluble.
- B. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
 1. Composition: 1 lb./1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
- C. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
- D. Chelated Iron: Commercial-grade FeEDDHA for dicots and woody plants, and commercial-grade FeDTPA for ornamental grasses and monocots.

PART 3 - EXECUTION

3.1 GENERAL

- A. Place planting soil and fertilizers according to requirements in the soils report.
- B. 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 planting soil.
- C. Proceed with placement only after unsatisfactory conditions have been corrected.

3.2 BLENDING PLANTING SOIL IN PLACE

- A. General: Mix amendments with in-place, unamended soil to produce required planting soil. Do not apply materials or till if existing soil or subgrade is muddy or excessively wet.
- B. Preparation: Till unamended, existing soil in planting areas to a minimum depth 8 inches. Remove stones larger than 1-1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
- C. Mixing: Apply soil amendments and fertilizer, if required, evenly on surface, and thoroughly blend them into full depth of unamended, in-place soil to produce planting soil.
 - 1. Mix lime and sulfur with dry soil before mixing fertilizer.
 - 2. Mix fertilizer with planting soil no more than seven days before planting.
- D. Compaction: Compact blended planting soil to 80 percent of maximum Standard Proctor density according to ASTM D 698.
- E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.3 PROTECTION

- A. Protect areas of in-place soil from additional compaction, disturbance, and contamination. Prohibit the following practices within these areas except as required to perform planting operations:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Vehicle traffic.
 - 4. Foot traffic.
 - 5. Erection of sheds or structures.
 - 6. Impoundment of water.
 - 7. Excavation or other digging unless otherwise indicated.
- B. If planting soil or subgrade is over compacted, disturbed, or contaminated by foreign or deleterious materials or liquids, remove the planting soil and contamination; restore the subgrade as directed by Architect and replace contaminated planting soil with new planting soil.

3.4 CLEANING

- A. Protect areas adjacent to planting-soil preparation and placement areas from contamination. Keep adjacent paving and construction clean and work area in an orderly condition.

- B. Remove surplus soil and waste material including excess subsoil, unsuitable materials, trash, and debris and legally dispose of them off Owner's property unless otherwise indicated.
 - 1. Dispose of excess subsoil and unsuitable materials on-site where directed by Owner.

END OF SECTION 32 91 13

SECTION 32 92 00 - TURF AND GRASSES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Sodding.
- B. Related Requirements:
 - 1. Section 328400 "Planting Irrigation".
 - 2. 329113 "Soil Preparation".
 - 3. Section 329300 "Plants".

1.3 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of planting soil.
- B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
- C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- D. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Section 329113 "Soil Preparation" and drawing designations for planting soils.
- E. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For landscape Installer.
 - 1. Certification of each seed mixture for turfgrass sod. Include identification of source and name and telephone number of supplier.
- B. Product Certificates: For fertilizers, from manufacturer.
- C. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful turf establishment.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.
- B. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" sections in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod within 24 hours of harvesting and in time for planting promptly. Protect sod from breakage and drying.
- C. Bulk Materials:
 - 1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
 - 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 - 3. Accompany each delivery of bulk materials with appropriate certificates.

1.8 FIELD CONDITIONS

- A. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

PART 2 - PRODUCTS**2.1 TURFGRASS SOD**

- A. Turfgrass Sod: Shall be as indicated on the Plans, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture that is strongly rooted and capable of vigorous growth and development when planted.
- B. Turfgrass Species: Southland Sod Farms Marathon II Dwarf Tall Fescue or approved equal.

2.2 FERTILIZERS

- A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
 - 1. Composition: 1 lb/1000 sq. ft of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
- B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 - 1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.

2.3 PESTICIDES

- A. Contractor shall comply with the City of Carlsbad **INTEGRATED PEST MANAGEMENT PLAN**, November 2017 or as amended. Prior to application of any Pesticides or Herbicides, Contractor shall submit Product name, intended use of Product, and Product information to City. City approval of Product is required prior to use.
- B. General: Pesticide, registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer 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.
- C. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.
- D. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work.
 - 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. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 - 3. Uniformly moisten excessively dry soil that is not workable or which is dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. 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 Architect and replace with new planting soil.

3.2 PREPARATION

- A. Protect structures; utilities; sidewalks; pavements; and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
 - 1. Protect grade stakes 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 properties and walkways.

3.3 TURF AREA PREPARATION

- A. General: Prepare planting area for soil placement and mix planting soil according to Section 329113 "Soil Preparation".
 - 1. Reduce elevation of planting soil to allow for soil thickness of sod.
- B. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- C. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 SODDING

- A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.
- B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to soil or sod during installation. Tamp and roll lightly to ensure contact with soil, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.
 - 1. Lay sod across slopes exceeding 1:3.
- C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

3.5 TURF RENOVATION

- A. Renovate turf damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.
 - 1. Reestablish turf where settlement or washouts occur or where minor regrading is required.
 - 2. Install new planting soil as required.
- B. Remove sod and vegetation from diseased or unsatisfactory turf areas; do not bury in soil.
- C. Remove topsoil containing foreign materials, such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting soil.
- D. Mow, dethatch, core aerate, and rake existing turf.
- E. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.
- F. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.
- G. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches.
- H. Apply sod as required for new turf.
- I. Water newly planted areas and keep moist until new turf is established.

3.6 TURF MAINTENANCE

- A. General: Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch 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.
- B. Watering: Irrigate to keep turf uniformly moist to a depth of 4 inches.
 - 1. Schedule watering to prevent wilting, puddling, 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 top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than one-third of grass height. Remove no more than one-third of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:
 - 1. Mow bentgrass to a height of 1/2 inch or less.
 - 2. Mow bermudagrass to a height of 1/2 to 1 inch.
 - 3. Mow turf-type tall fescue to a height of 2 to 3 inches.
- D. Turf Post fertilization: Apply commercial fertilizer after initial mowing and when grass is dry.
 - 1. Use fertilizer that provides actual nitrogen of at least 1 lb/1000 sq. ft. to turf area.

3.7 SATISFACTORY TURF

- A. Turf installations shall meet the following criteria as determined by Architect:
 - 1. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.
- B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

3.8 PESTICIDE APPLICATION

- A. Contractor shall comply with the City of Carlsbad **INTEGRATED PEST MANAGEMENT PLAN**, November 27 or as amended. Prior to application of any Pesticides or Herbicides, Contractor shall submit Product name, intended use of

Product, and Product information to City. City approval of Product is required prior to use.

- B. Apply pesticides and other chemical products and biological control agents according to 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.
- C. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.9 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.
- C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.
- D. Remove nondegradable erosion-control measures after grass establishment period.

3.10 MAINTENANCE SERVICE

- A. Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in "Turf Maintenance" Article. Begin maintenance immediately after each area is planted and continue until acceptable turf is established, but for not less than the following periods:
 - 1. Sodded Turf: The Maintenance Period shall be the same as indicated in Section 329300 "Plants".

END OF SECTION 32 92 00

SECTION 32 93 00 – PLANTS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Plants.
 - 2. Tree stabilization.
- B. Related Requirements:
 - 1. Section 328400 "Planting Irrigation".
 - 2. Section 329113 "Soil Preparation".
 - 3. Section 329200 "Turf and Grasses".

1.3 DEFINITIONS

- A. Backfill: The earth used to replace or the act of replacing earth in an excavation.
- B. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.
- C. Finish Grade: Elevation of finished surface of planting soil.
- D. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.
- E. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- F. Planting Area: Areas to be planted.

- G. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Section 329113 "Soil Preparation" for drawing designations for planting soils.
- H. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.
- I. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.
- J. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.
- K. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.4 COORDINATION

- A. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.
 - 1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
 - 2. Plant Photographs: Include color photographs in digital format of each required species and size of plant material as it will be furnished to Project. Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.
 - 3. Root barrier:

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.
- B. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:
 - 1. Manufacturer's certified analysis of standard products.
 - 2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.
- C. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.
- D. Sample Warranty: For special warranty.

1.8 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before expiration of required maintenance periods.
- B. Guarantee:
 - 1. The Contractor shall guarantee all 15 gallon and larger size trees installed under the contract to live and grow for one year from the day of final acceptance of the contract work unless decline of tree is specifically attributable to causes unrelated to installation, plant material quality and the Contractor's maintenance practices.
 - 2. The Contractor shall guarantee all other plant material, including ground covers to live and grow for a period of 90 calendar days from the last day of the maintenance period or final acceptance of the contract work whichever is the later. The Contractor shall replace, at its expense, all plant material found to be dead, missing, or in poor condition during the maintenance period within 5 days of discovery of such plant material. The Engineer shall be the sole judge as to the condition of the plant material. Plant material found to be dead or in poor condition within the guarantee period shall be replaced by the Contractor, at its expense, within 15 days of written notification. Replacements shall be made to the same specifications required for the original plantings.
 - 3. The Contractor shall submit written vegetation, planting and irrigation guarantee in approved form that all work showing defects in materials or workmanship will be repaired or replaced at no cost to the City for a period of one year from the date of acceptance by the City. The

Guarantee form shall be retyped on the Contractor's letterhead and contain the following verbiage:

- a. "Guarantee for Vegetation, Planting and Irrigation System For (Project Name)

We hereby guarantee that the vegetation, planting, and irrigation system we have furnished and installed for (project name) is free from defects in materials and workmanship, and the work has been completed in accordance with the drawings and specifications. We agree to repair or replace any defect in vegetation, material or workmanship, including that due to ordinary wear and tear, which may develop during the periods specified in section 308-7 of the Standard Specifications and the Special Provisions of said project from date of completion of the Work or termination of any maintenance period, whichever is the later, and also to repair or replace any damage resulting from the repairing or replacing of such defects at no additional cost to the Agency.

This guarantee does not extend to the unusual abuse or neglect that may occur subsequent to the date of completion of the Work or termination of any maintenance period, whichever is the later. We shall make such repairs or replacements within a reasonable time, as determined by the Engineer, after receipt of written notice. In the event of failure to make such repairs or replacements within a reasonable time after receipt of written notice from the Engineer, we authorize the Engineer to proceed to have said repairs or replacements made at our expense, and we will pay the costs and charges therefore upon demand.

Project: (Project Name)

Location: (Legal Description of Project Property)

Name of Contractor:

Address: (Of Contractor)

Telephone: (Of Contractor)

By: (Typed of printed names of signing Officer(s) of the Contractor authorized to bind the Contactor in legal matters)

Title: (Of said officer(s))

Signature(s)

Date of Execution."

1.9 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of plants.
1. Experience: Five years' experience in landscape installation in addition to requirements in Section 014000 "Quality Requirements."

2. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
 3. Pesticide Applicator: State licensed, commercial.
- B. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.
- C. Plant Material Observation: Architect may observe plant material at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Architect may also observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and may reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.
1. Notify Architect of sources of planting materials seven days in advance of delivery to site.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws if applicable.
- B. Bulk Materials:
1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 3. Accompany each delivery of bulk materials with appropriate certificates.
- C. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.
- D. Handle planting stock by root ball.
- E. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.
- F. Deliver plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set plants

and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

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

1.11 FIELD CONDITIONS

- A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

1.12 WARRANTY

- A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner.
 - b. Structural failures including plantings falling or blowing over.
 2. Warranty Periods: From date of project turnover to the City.
 - a. Trees: 12 months.
 - b. Shrubs and Ground Covers, and Other Plants: Three months.
 3. Include the following remedial actions as a minimum:
 - a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
 - b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
 - c. A limit of one replacement of each plant is required except for losses or replacements due to failure to comply with requirements.

- d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

- A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in the Plant Legend. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
 1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch (19 mm) in diameter; or with stem girdling roots are unacceptable.
 2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.
- B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.
- C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.
- D. Labeling: Label at least one plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant.

2.2 FERTILIZERS

- A. Planting Tablets: Tightly compressed chip-type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.
 1. Size: 21-gram size tablets.
 2. Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.

2.3 MULCHES

- A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs.

- B. Bark mulch shall be supplied by MB Organics or approved equal. Submit 1/2 cu. ft. of Carlsbad Stump Mix Mulch for approval.
- C. Supplier Information:
MB Organics/Organic Solutions,
920 W. San Marcos, Blvd, #1A,
San Marcos, CA 92069.
Phone: 760-471-7611

2.4 PESTICIDES

- A. Contractor shall comply with the City of Carlsbad **INTEGRATED PEST MANAGEMENT PLAN**, November 27 or as amended. Prior to application of any Pesticides or Herbicides, Contractor shall submit Product name, intended use of Product, and Product information to City. City approval of Product is required prior to use.
- B. General: Pesticide registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer 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.
- C. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.
- D. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

2.5 TREE-STABILIZATION MATERIALS

- A. Trunk-Stabilization Materials:
 - 1. Upright Stakes: Rough-sawn, sound, lodge pole pine, treated with copper nanthanate or pressure treated with chromated copper arsenate, 2-by-2-inch nominal by 10' length, and pointed at one end.
 - 2. Flexible Ties: Wide rubber or elastic bands or straps of length required to reach.

2.6 MISCELLANEOUS PRODUCTS

- A. Root Barrier: Black, molded, modular panels 36 high (deep), 85 mils thick, and with vertical root deflecting ribs protruding 3/4 inch out from panel surface; manufactured with minimum 50 percent recycled polyethylene plastic with UV inhibitors.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine areas to receive plants, with Installer present, for compliance with requirements and conditions affecting installation and performance of the Work.
 - 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. Verify that plants and vehicles loaded with plants can travel to planting locations with adequate overhead clearance.
 - 3. Suspend planting 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 or which is dusty.
- B. 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 Architect and replace with new planting soil.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.
- B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.
- D. Lay out plants at locations directed by Architect. Stake locations of individual trees and shrubs and outline areas for multiple plantings.

3.3 PLANTING AREA ESTABLISHMENT

- A. General: Prepare planting area for soil placement and mix planting soil according to Section 329113 "Soil Preparation."

- B. Placing Planting Soil: Place and mix planting soil in-place over exposed subgrade.
- C. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 EXCAVATION FOR TREES AND SHRUBS

- A. Planting Pits and Trenches: Excavate circular planting pits.
 - 1. Excavate planting pits with vertical sides. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit during excavation.
 - 2. Excavate approximately two times as wide as the container diameter.
 - 3. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
 - 4. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
 - 5. Maintain supervision of excavations during working hours.
 - 6. Keep excavations covered or otherwise protected when unattended by Installer's personnel.
- B. Backfill Soil: Subsoil and topsoil removed from excavations may be used as backfill soil after being amended per Section 329113 "Soil Preparation".
- C. Obstructions: Notify Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.
 - 1. Hardpan Layer: Drill 6-inch diameter holes, 24 inches apart, into free-draining strata or to a depth of 10 feet, whichever is less, and backfill with free-draining material.
- D. Drainage: Notify Landscape Architect if subsoil conditions show evidence of unexpected water seepage or retention in tree or shrub planting pits.
- E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.5 TREE, SHRUB, AND VINE PLANTING

- A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.
- B. Container-Grown Stock: Set each plant plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.

1. Backfill: Planting soil.
2. Carefully remove root ball from container without damaging root ball or plant.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
 - a. Quantity:
 - i. One tablet per one-gallon container.
 - ii. Two tablets per five-gallon container.
 - iii. Four tablets per 15-gallon container.
 - iv. Eight tablets per 24" box container.
 - v. One tablet per each two (2) inches of box size container.
5. Continue backfilling process. Water again after placing and tamping final layer of soil.

3.6 TREE, SHRUB, AND VINE PRUNING

- A. Remove only dead, dying, or broken branches. Do not prune for shape.

3.7 TREE STABILIZATION

- A. Trunk Stabilization by Upright Staking and Tying: Install trunk stabilization as follows unless otherwise indicated:
 1. Upright Staking and Tying: Stake trees with two stakes per tree for 24" box size and larger to prevent wind tip out. Use a minimum of two stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.
 2. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.

3.8 ROOT-BARRIER INSTALLATION

- A. Install root barrier where trees are planted within 10 feet of paving or other hardscape elements, such as walls, curbs, and walkways and where indicated on Drawings.
- B. Align root barrier vertically and run it linearly along and adjacent to the paving or other hardscape elements to be protected from invasive roots.

- C. Install root barrier continuously for a distance of 10 feet in each direction from the tree trunk, for a total distance of 20 feet per tree. If trees are spaced closer, use a single continuous piece of root barrier.
 - 1. Position top of root barrier flush with finish grade according to manufacturer's written recommendations.
 - 2. Do not distort or bend root barrier during construction activities.
 - 3. Do not install root barrier surrounding the root ball of tree.

3.9 GROUND COVER AND PLANT PLANTING

- A. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated on Drawings in even rows with triangular spacing.
- B. Use amended planting soil for backfill.
- C. Dig holes large enough to allow spreading of roots.
- D. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
- E. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
- F. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.10 PLANTING AREA MULCHING

- A. Mulch backfilled surfaces of planting areas and other areas indicated.
 - 1. Trees in Turf Areas: Apply organic mulch ring of 3-inch average thickness, with 12-inch radius around trunks. Do not place mulch within 3 inches of trunks.
 - 2. Organic Mulch in Planting Areas: Apply 3-inch average thickness of organic mulch over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.

3.11 PLANT MAINTENANCE

- A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.
- B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

- C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.12 PESTICIDE APPLICATION

- A. Apply pesticides and other chemical products and biological control agents according to 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 Nonselective): Apply to tree, shrub, and ground-cover areas according to manufacturer's written recommendations. Do not apply to seeded areas.
- C. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.13 REPAIR AND REPLACEMENT

- A. General: Repair or replace existing or new trees and other plants that are damaged by construction operations, in a manner approved by Architect.
 - 1. Submit details of proposed pruning and repairs.
 - 2. Perform repairs of damaged trunks, branches, and roots within 24 hours, if approved.
 - 3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Architect.
- B. Remove and replace trees that are more than 25% dead or in an unhealthy condition before the end of the corrections period or are damaged during construction operations that Architect determines are incapable of restoring to normal growth pattern.
 - 1. Provide new trees of same size as those being replaced for each tree.
 - 2. Species of Replacement Trees: Same species being replaced.

3.14 CLEANING AND PROTECTION

- A. During planting, keep adjacent paving and construction clean and work area in an orderly condition. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

- C. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.
- D. After installation and before the Maintenance Period remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.
- E. At time of completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

3.15 MAINTENANCE SERVICE

- A. Maintenance Service for Trees, Shrubs, Ground Cover, and Other Plants: Provide maintenance by skilled employees of landscape Installer. Maintain as required in "Plant Maintenance" Article. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:
 - 1. Maintenance Period: 120 days from date of Substantial Completion.
 - 2. Upon completion of the Maintenance Period, a final inspection shall be performed by the Architect and City. The Maintenance Period may be extended by the City if the planted areas are improperly maintained, appreciable plant replacement is required, or other corrective work becomes necessary.

END OF SECTION 32 93 00

SECTION 33 10 00 – WATER UTILITIES**PART 1 - DESCRIPTION****1.1 SCOPE**

- A. The Contractor shall provide all labor and equipment necessary and required to install all of the water line facilities in accordance with the Contract Documents. Work shall include, but not be limited to:
 - 1. Installation of water distribution systems (both domestic & fire services) consisting of all pipe, fittings, valves, valve boxes, hydrants, anchor and/or thrust blocks, and all necessary and required appurtenances, accessory items and operations including connection(s) to the existing on site water main lateral(s).
 - 2. Installation of building water service line(s), consisting of all pipe, fittings, valves and valve boxes, anchor and/or thrust blocks, and all necessary and required accessory items and operations, including connection(s) to the water distribution system.
 - 3. Testing and disinfection.

1.2 WORK SPECIFIED UNDER OTHER SECTIONS

- A. The following related work is specified under other Sections:
 - 1. Site Concrete Work (32 13 13)

1.3 REFERENCES

- A. Greenbook Standard Specifications for Public Works Construction (Greenbook).
- B. Standard Plans for Public Works Construction, APWA – Southern California Chapter (APWA).

1.4 SUBMITTALS

- A. Product Data: Water valves, water meter, back flow devices. Submit to Owner's representative.
- B. Shop Drawings: Precast concrete valve pits and meter pit, including frames and covers. Submit to Owner's representative.

1.5 QUALITY ASSURANCE

- A. Certificate of Compliance attesting that tests set forth in the referenced publications have been performed, and the performance requirements have been satisfied.
- B. Regulatory Requirements:

1. Comply with requirements of the serving utility, pertaining to water service.
2. Comply with requirements of fire authority having jurisdiction, pertaining to materials, hose threads, and installation details.
3. Comply with requirements of NFPA 24 for materials and installation.

1.6 REFERENCE STANDARDS

- A. The publication listed below form part of this specification referring to PVC pipe. Reference shall be made to the latest edition of said standards unless otherwise called for.
 1. AWWA C900 — PVC Pressure Pipe, 100mm (4") Through 300mm (12") for water Distribution
 2. AWWA C905 — PVC Water Transmission Pipe, 350mm (14") Through 1200mm (48") AWWA M23 — PVC Pipe-Design and Installation
 3. Uni-Bell — Handbook of PVC Pipe Design and Construction

PART 2 - CONSTRUCTION DETAILS

2.1 GENERAL

- A. The Contractor shall install all water line pipe, fittings and appurtenances in the locations as shown on the Drawings. Pipe and fittings shall be of the type and sizes specified and shall be laid accurately to line and grade. Hydrants, valves and all other water line appurtenances shall be accurately located and properly oriented.
- B. The installation of all water lines shall conform with Reference Standards, American Water Works Association, the standards and specifications of the serving water utility, and the requirements of the fire authority having jurisdiction.
- C. The requirements of the Local Health Department and any other Authority having jurisdiction shall govern the horizontal and vertical separation of water lines from sanitary sewers and the hydrostatic testing and disinfection of the water line.

2.2 TRENCH EXCAVATION AND BACKFILL

- A. The provisions of the geotechnical report and its specific recommendations to "Compaction" shall govern all work under this Article.

2.3 STORAGE AND HANDLING

- A. Storage - Storage of pipe, fittings, valves, hydrants and other water line appurtenances on the job shall be in accordance with the manufacturers' recommendations.

- B. Handling - All pipe, fittings, valves, hydrants and other water line appurtenances shall be protected against impact, shock and free fall, and only equipment of sufficient capacity and proper design shall be used in their handling. Special care shall be taken to prevent damage to pipe coatings. The interior of the pipe shall be cleaned before being laid and shall be kept clean until accepted. All material shall be carefully inspected for defects in workmanship and materials; all debris and foreign material cleaned out of valve openings, etc.; all operating mechanisms operated to check their proper functioning; and all nuts and bolts checked for tightness. Valves, hydrants and other equipment which do not operate easily or are otherwise defective shall be repaired or replaced.

2.4 DAMAGE

- A. General - Pipe, fittings, valves, hydrants and other water line appurtenances which are defective from any cause, including damage caused by handling, shall be unacceptable for installation and shall be replaced at no cost to the Owner.
- B. Damage Due to Cutting - All cutting of pipe shall be done with an approved power- driven or mechanical cutter. All cut ends shall be thoroughly examined for possible cracks caused by cutting, and any cut pipe found to have such cracks shall be rejected. The cut ends of all pipe shall be beveled and ground smooth.
- C. Inspection for Damage - All pipe and fittings shall be subjected to a careful inspection and proper testing just before being laid. Any pipe, fitting or appurtenance which shows a crack or which has received a severe blow that may have caused an incipient fracture even though no such fracture can be seen, shall be marked as rejected and removed at once from the Work.
- D. Damage Prior to Acceptance - Pipe and all water line appurtenances that are damaged or disturbed through any cause prior to acceptance of the Work shall be repaired, realigned or replaced as directed by the jurisdiction inspectors at no cost to the Owner.

2.5 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 on the Drawings. Pipe shall be laid upgrade with bells uphill, with the top of pipe at a minimum depth as specified hereinafter, except where otherwise noted on the Drawings.

No pipe, valve, blow-off or fitting shall be laid on wood blocks. Similarly, no pieces of rock, brick, or other material other than earth or gravel shall be left under or adjacent to the pipe. Pipe layering, in general, shall conform to the latest Standard Specifications of the AWWA for laying pipe.

Generally, trenches shall not be opened for more than 200 feet in advance of pipe laying nor left unfilled for more than 100 feet in the rear of pipe laying. New trenches will not be permitted when earlier trenches require backfilling.

Every length of pipe shall be inspected and cleaned of all dirt and debris before being laid. The interior of the pipe and the jointing seal shall be free from sand, dirt and debris before installing in the line. Extreme care shall be taken to keep the bells of the pipe free from dirt and debris so that joints may be properly assembled.

No length of pipe shall be laid until the preceding lengths of pipe have been thoroughly embedded in place, to prevent movement or disturbance of the pipe.

- B. Bedding and Backfilling - The type of materials to be used in bedding and backfilling and the method of placement shall conform to the requirements of the details of the Drawings coupled with the pertinent sections of the Geotechnical report.
- C. Protection During Construction - The Contractor shall protect the installation at all times during construction, and 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 pipes shall be closed by approved temporary watertight plugs. If water is in the trench when work is resumed, the plug 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 plant 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.

- D. Pipe Deflection - Maximum allowable deflection for pipe laid without fittings shall not exceed the pipe manufacturer's requirements and the requirements of the jurisdiction. Deflection which exceeds the maximum allowable as established by the pipe manufacturer and the Water Authority or any other Authority having jurisdiction shall be grounds for rejection of the line of pipe by the Owner's Field Representative.
- E. Cover on Main - The water main shall be laid so as to provide a minimum cover of three (3) feet below finished grade, or meet the requirements of the jurisdiction, whichever is greater. The Contractor is advised that at pipe crossings, minimum cover must be maintained and also proper clearance between pipes must be maintained. No additional payment will be made for increased depth of trench to comply with crossing requirements.
- F. 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. PVC pipe shall be provided in standard 6.10m (20" foot) lengths, unless otherwise detailed on the Approved Plans.

- G. PVC Pipe Horizontal radius: In areas where it is required to lay the pipe along a curve, the use of deflection couplings will be used to form the arc. The pipe shall not be bent to form the arc, nor shall the pipe be deflected within integral bells or ductile- iron fittings. Deflection couplings shall be limited to use only on 150mm through 300mm (6"-12"), AWWA C900 PVC pipe. Unless otherwise approved PVC pipe shall be installed using 5° deflection couplings (21/2° at each bell) to form arcs with radii no less than the minimums noted below.

Pipe Length Used	Minimum Radius
20'	229'
10'	115'
Combination (refer to Section 3)	76'

2.6 JOINTS

- A. All joints are to be made watertight and pressure-tight in accordance with the requirements specified herein.
- B. Unless otherwise permitted, jointing of all pipe and fittings shall be done entirely in the trench.
- C. Except as may be otherwise specified herein, all sections of the pipe to be joined shall have a bell end and a plain end. Installation of cut sections of pipe without a bell end will not be allowed.

2.7 WATER LINE APPURTENANCES

- A. Fittings
- Fittings shall be used at all breaks in grade or alignment where deflection of the pipe exceeds the maximum allowable pipe deflection as specified above. Only proper fittings shall be used to obtain the required deflection.
- B. Valves and Valve Boxes
- Gate valves shall be installed on all water lines where and as shown on the Drawings and as specified herein. Unless otherwise stated, valves shall be of the same size as the line.
 - Gate valves shall be installed on all hydrant laterals where and shown on the Drawings.
 - Valves shall be installed on all service lines in the locations shown.
 - Valve boxes shall be placed over all buried valves. Valve boxes shall be placed so as not to transmit vehicle loads or shock to the valves and shall

be centered and set plumb over the operating nut of the valve. The cover of the box shall be set even with finished grade.

C. Hydrants

1. Hydrants shall be installed where and as shown on the Drawings and as specified herein.
2. Hydrants shall be installed vertical and plumb, with the proper cover over the hydrant lateral and proper vehicular clearance from the curb line and/or edge of pavement. The installation shall provide proper access for fire department connections.
3. Hydrants and their installation shall conform to the requirements of the jurisdiction.

D. Restraining Devices

1. The installation of the restrained joints and rodding shall be as shown on the drawings, details and as approved by the jurisdictional inspectors. E. Concrete Blocking

E. Concrete Blocking

1. Where pipes change horizontal and vertical direction, at hydrants, tees and other fittings, and whenever abnormal thrust forces are developed, the Contractor shall construct thrust and/or anchor blocks as detailed on the Drawings. They shall be constructed of Class "A" concrete, of minimum dimensions as detailed on the Drawings or of adequate size to suit actual conditions to withstand the pressures anticipated, and shall be founded in virgin soil. Thrust block installation shall comply with jurisdiction field inspector's requirements.

2.8 CONNECTIONS TO EXISTING FACILITIES

- A. General Requirements - The Contractor shall make all required connections of the proposed water line facilities into existing water line facilities, where and as shown on the Drawings.
- B. Compliance with Requirements of Owner of Facility - Connections made into existing water line 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.

2.9 SERVICE LINES

- A. General Requirements - The Contractor shall make all required connection(s) of the building water service line(s) into the water distribution system where and as

shown on the Drawings. Work shall include making the service line connection(s) to the water distribution system, furnishing and installing service line valves, valve boxes and all service line pipe from the water distribution system to point(s) and properly sealing the end(s) with watertight and pressure-tight plug(s), except that, if the building plumbing contractor has installed his portion of the water service lines, work under this Contract shall also include final connection(s) of the water service lines to the building service line(s) installed by the building plumbing contractor. The connection(s) shall be made utilizing proper fittings compatible with the building service line(s) providing watertight and pressure-tight connection(s) and shall be done at no additional cost to the Owner.

- B. Service Lines Greater Than Two (2) Inches - All service lines greater than two(2) inches in diameter shall be Ductile Iron Pipe or PVC Pressure Pipe as indicated on drawings. Each service line shall be valved with a gate valve where and as directed. Unless specified otherwise, connections of service lines at the main shall be made with appropriate size tees.
- C. Coordination with Building Plumbing Contractor - The Contractor shall 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 prior to construction.

2.10 DISINFECTION OF COMPLETED LINE

- A. After the water line has passed the required pressure and leakage tests and before being placed in service, the entire line shall be disinfected. All disinfecting methods and materials shall be in accordance with AWWA Specification C-651. All disinfection operations and procedures shall meet with the approval of the Water Authority and Health Department.
- B. If the initial bacteriological tests are not satisfactory, the Contractor shall do everything necessary to obtain satisfactory bacteriological tests including making provisions to isolate shorter sections of the line if necessary to locate the source of contamination. All work necessary and required to obtain satisfactory bacteriological tests shall be at the Contractor's expense and at no additional cost to the Owner.
- C. In the event of conflict between the tests specified herein and the test requirements of the jurisdiction's Health Department or any other Authority having jurisdiction over all or any portion of the water lines installed under this Contract, the more restrictive requirements shall govern.

PART 3 - MATERIALS

The materials to be used in the construction shall be those indicated on the Drawings and specified herein, and the Contractor shall supply to the Architect, prior to installation, certificates of compliance for the material used. The Contractor shall also submit shop drawings and catalog cuts of all water line items and appurtenances (pipes, fittings, valves, valve boxes, hydrants, etc.), to the Architect for approval prior to ordering.

3.1 WATER SYSTEM AND APPURTENANCES

- A. General - All materials for water lines and appurtenances shall be in accordance with the requirements of the jurisdiction.
- B. Polyvinyl Chloride(PVC) Pressure Pipe –
 - 1. PVC pipe in sizes 100mm (1") through 300mm (12") shall comply with the requirements of AWWA C900, Class 200 (DR 18) or as specified on the plans.
 - 2. Pipe joints shall be integrally molded bell ends in accordance with ASTM D 3034 Table 2 with factory supplied elastomeric gasket and lubricants.
- C. PVC Deflection Couplings
 - 1. PVC deflection couplings that allow for 2W deflection at each bell for a maximum of 5° total deflection are limited to use on 100mm (1") through 300mm (12") AWWA C900 PVC pipe.
 - 2. Deflection couplings for use with AWWA C905 PVC pipe shall be in accordance with the manufacturer's recommendations shall be submitted to and approved by the Civil Engineer prior to installation.
- D. PVC Fittings - Shall conform to AWWA C110, to ANSI A21.10 grey iron or ductile-iron for use with PVC pipe. fittings shall have mechanical joint type or push-on type joints manufactured specifically for PVC pipe. Couplings shall be Certainteed Corp., Fluid- Tile, Johns Manville Ring-Tite or approved equal.
- E. PVC Pipe Tracer Wire - Provide tracer wire materials, continuous full length at each run.
- F. PVC Pipe Warning/Identification Tape — Provide warning/Identification tape materials.
- G. Gate Valve Boxes - Use Parkson Tyler, APCO or approved equal deep skirted lid (4" or more) type, sliding adjustable cast iron valve box c.i. min. t.s. 30,000 p.s.i.

END OF SECTION – 33 10 00

SECTION 33 40 00 – STORM DRAINAGE UTILITIES**PART 1 -DESCRIPTION****1.1 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. Where shown, installation of under-drains consisting of all pipe, fittings and required accessory items and operations, including connections to the proposed and/or existing drainage system.

1.2 WORK SPECIFIED UNDER OTHER SECTIONS

- A. The following related work is specified under other Sections:
 - 1. Site Concrete Work (32 13 13)

1.3 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**2.1 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.

2.2 TRENCH EXCAVATION AND BACKFILL

- A. The provisions of the geotechnical report and its specific recommendations to "Compaction" shall govern all work under this Article.

2.3 STORAGE AND HANDLING

- A. Storage - Storage of storm drain pipe and appurtenances on the job shall be in accordance with the manufacturers' recommendations and to minimize out-of-

roundness. Pipes shall be stored in shaded areas to minimize effects of thermal and ultraviolet exposure.

- 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.

2.4 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.

2.5 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. Pipe shall be laid upgrade unless otherwise directed by the Owner's Field Representative. 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. High Density Polyethylene Pipe (H.D.P.E.) & Fittings shall be installed in accordance with ASTM D-2321 or manufacturer's recommendations.
- C. Pipe Extensions - Where existing pipe is to be extended, the same type of pipe shall be used unless otherwise specified.
- D. 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.
- E. 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.

- F. 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 details of the Drawings.
- G. 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 plant 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.
- H. 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.

2.6 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. PVCP Pipe — ASTM D 3034, SDR-35

2.7 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 Engineer. 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 Engineer.

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. 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 unless otherwise indicated on plans.

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.

- C. 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.

- D. 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.

- E. 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.

2.8 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.

2.9 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. 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.
- D. 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 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.

2.12 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 Representative. The Work shall visually gravity flow tested and deemed to not be complete until all design and jurisdiction requirements for line, grade cleanliness, and workmanship have been met.

PART 3 - MATERIALS

- A. The materials to be used in the construction shall be those indicated on the Drawings and specified herein. The Contractor shall supply to the Owner's Representative, 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.

3.2 STORM DRAIN PIPE, FITTINGS AND JOINTS

- A. Underdrains - Pipe, Fittings and Filter Materials

1. Filter Material - shall be approved crushed aggregate meeting the requirements of ASTM Designation C-33, size No. 57.

- B. 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.
4. Follow the Manufacturer's recommendations for the minimum allowable radius for the size of pipe use
5. 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.

3.3 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. 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, unless otherwise noted on plans.

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.

- C. Drain Inlet and Catch Basin Frames and Grates - shall be as specified on the Drawings. 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.

- D. Concrete and Reinforcing - shall conform to the requirements as specified under the Section of these Specifications entitled "Site Concrete".

- E. 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 M45, 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.

- F. 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 D2146 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 33 40 00

CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS

APPENDICES

APPENDIX A: Tier 2 SWPPP Template

APPENDIX B: Shade Structure Sheets

**APPENDIX C: Geotechnical Evaluation, Ninyo & Moore,
dated February 13, 2015**

CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS

Appendix A

Tier 2 SWPPP Template

TIER 2 CITY STORM WATER POLLUTION PREVENTION PLAN (TIER 2 SWPPP)

SW_____ - _____

STORM WATER POLLUTION PREVENTION NOTES

GENERAL SITE MANAGEMENT REQUIREMENTS

THE FOLLOWING GENERAL SITE MANAGEMENT REQUIREMENTS SHALL BE ADHERED TO THROUGHOUT THE DURATION OF THE CONSTRUCTION WORK (YEAR ROUND).

1. IN CASE EMERGENCY WORK IS REQUIRED, CONTACT:_____ FROM:_____ AT (TEL.NO.)_____.
2. DEVICES SHOWN ON CITY APPROVED PLANS SHALL NOT BE MOVED OR MODIFIED WITHOUT THE APPROVAL OF THE ENGINEERING INSPECTOR.
3. THE CONTRACTOR SHALL RESTORE ALL EROSION CONTROL DEVICES TO WORKING ORDER TO THE SATISFACTION OF THE CITY ENGINEER AFTER EACH RUN-OFF PRODUCING RAINFALL.
4. THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL MEASURES AS MAY BE REQUIRED BY THE CITY ENGINEER DUE TO UNCOMPLETED GRADING OPERATIONS OR UNFORSEEN CIRCUMSTANCES WHICH MAY ARISE.
5. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT PUBLIC TRESPASS ONTO AREAS WHERE IMPOUNDED WATERS CREATE A HAZARDOUS CONDITION.
6. GRADING AREAS AROUND THE PROJECT PERIMETER MUST DRAIN AWAY FROM THE FACE OF SLOPE AT THE CONCLUSION OF EACH WORKING DAY.
7. ALL REMOVABLE PROTECTIVE DEVICES SHALL BE IN PLACE AT THE END OF EACH WORKING DAY WHEN FIVE (5) DAY RAIN PROBABILITY FORECAST EXCEEDS FORTY PERCENT (40%). SILT AND OTHER DEBRIS SHALL BE REMOVED AFTER EACH RAINFALL.
8. ALL GRAVEL BAGS SHALL CONTAIN 3/4 INCH MINIMUM AGGREGATE.
9. ALL EXPOSED DISTURBED AREAS MUST HAVE EROSION PROTECTION BMPs PROPERLY INSTALLED. THIS INCLUDES ALL BUILDING PADS, UNFINISHED ROADS, AND SLOPES.
10. ADEQUATE PERIMETER PROTECTION BMPs MUST BE INSTALLED AND MAINTAINED AND WILL BE UPGRADED, IF NECESSARY, TO PROVIDE SUFFICIENT PROTECTION FROM RUNOFF DURING RAIN EVENTS.
11. ADEQUATE SEDIMENT CONTROL BMPs MUST BE INSTALLED AND MAINTAINED.
12. ADEQUATE BMPs TO CONTROL OFFSITE SEDIMENT TRACKING MUST BE INSTALLED AND MAINTAINED.
13. A MINIMUM OF 125% OF THE MATERIAL NEEDED TOO INSTALL STANDBY BMPs TO PROTECT THE EXPOSED AREAS FROM EROSION AND PREVENT SEDIMENT DISCHARGES, MUST BE STORED ONSITE. AREAS ALREADY PROTECTED FROM EROSION USING PHYSICAL STABILIZATION OR ESTABLISHED VEGETATION STABILIZATION BMPs ARE NOT CONSIDERED TO BE "EXPOSED" FOR PURPOSES OF THIS REQUIREMENT.
14. THE OWNER/DEVELOPER/CONTRACTOR MUST FOLLOW "WEATHER TRIGGERED" ACTION PLAN AND BE ABLE TO DEPLOY STANDBY BMPs TO PROTECT THE EXPOSED PORTIONS OF THE SITE WITHIN 48 HOURS OF A PREDICTED STORM EVENT (A PREDICTED STORM EVENT IS DEFINED AS A 40% CHANCE OF RAIN WITHIN A 5-DAY NATIONAL WEATHER SERVICE FORECAST). ON REQUEST, THE OWNER/DEVELOPER/CONTRACTOR MUST PROVIDE PROOF OF THIS CAPABILITY.
15. DEPLOYMENT OF PHYSICAL OR VEGETATION EROSION CONTROL BMPs MUST COMMENCE AS SOON AS SLOPES ARE COMPLETED. THE OWNER/DEVELOPER/CONTRACTOR MAY NOT RELY ON THE ABILITY TO DEPLOY STANDBY BMP MATERIALS TO PREVENT EROSION OF SLOPES THAT HAVE BEEN COMPLETED.
16. THE AREA THAT CAN BE CLEARED, GRADED, AND LEFT EXPOSED AT ONE TIME IS LIMITED TO THE AMOUNT OF ACREAGE THAT THE CONTRACTOR CAN ADEQUATELY PROTECT PRIOR TO A PREDICTED RAIN EVENT. FOR LARGER SITES, GRADING SHOULD BE PHASED. IT MAY BE NECESSARY TO DEPLOY EROSION AND SEDIMENT CONTROL BMPs IN AREAS THAT ARE NOT COMPLETED, BUT ARE NOT ACTIVELY BEING WORKED BEFORE ADDITIONAL GRADING IS ALLOWED TO PROCEED, AT THE DISCRETION OF THE CITY INSPECTOR.
17. ALL DISTURBED AREAS THAT ARE NOT COMPLETED AND/OR NOT BEING ACTIVELY GRADED MUST BE FULLY PROTECTED FROM EROSION IF LEFT FOR 14 OR MORE DAYS. THE ABILITY TO INSTALL BMP MATERIALS IN A PROMPT MANNER IS NOT SUFFICIENT. BMPs NEED TO BE INSTALLED IN THESE AREAS.
18. BMPs MUST BE STOCKPILED AT VARIOUS LOCATION THROUGHOUT THE PROJECT SITE THROUGHOUT THE YEAR. WHENEVER THERE IS A 40% CHANCE OR GREATER OF A RAIN WITHIN A THREE (3) DAY FORECAST, THE INSPECTOR WILL VERIFY THAT BMPs ARE ADEQUATELY STOCKPILED. BMPs MUST BE STOCKPILED AND READY FOR DEPLOYMENT WHEN THERE IS 50% CHANCE OF RAIN WITHIN A 48 HOUR FORECAST. FAILURE TO COMPLY WITH THIS REQUIREMENT COULD RESULT IN THE ISSUANCE OF A STOP WORK NOTICE OR OTHER ENFORCEMENT ACTION.
19. ALL TREATMENT AND EROSION CONTROL BMPs MUST BE INSPECTED WEEKLY AND PRIOR TO A FORECASTED RAIN EVENT OF GREATER THAN 50%. AND AFTER A RAIN EVENT. IN ADDITION, TREATMENT CONTROL BMPs MUST BE SERVICED AS NEEDED THROUGHOUT THE YEAR.
20. IF SELECTED BMP FAILS DURING A RAIN EVENT, IT MUST BE REPAIRED OR IMPROVED OR REPLACED WHILE AN APPROVED TABLE ALTERNATE AS SOON AS IT IS SAFE TO DO SO. THE FAILURE OF A BMP INDICATES IT WAS NOT ADEQUATE FOR THE CIRCUMSTANCES IN WHICH IT WAS USED. REPAIRS AND REPLACEMENT MUST THEREFORE PUT A MORE ROBUST BMP MEASURE IN PLACE.
21. ALL CONSTRUCTION EMPLOYEES MUST BE TRAINED ON THE IMPORTANCE OF STORM WATER POLLUTION PREVENTION AND BMP MAINTENANCE.

WEATHER TRIGGERED ACTION PLAN

THE DEVELOPER SHALL DEPLOY STANDBY BEST MANAGEMENT PRACTICE MEASURES TO COMPLETELY PROTECT THE EXPOSED PORTIONS OF THE SITE WITHIN 48 HOURS OF A PREDICTED STORM EVENT (A PREDICTED STORM EVENT IS DEFINED AS A FORECASTED, 40% CHANCE OF RAIN BY THE NATIONAL WEATHER SERVICE). IN ADDITION TO BMPs IMPLEMENTED YEAR-ROUND INCLUDING PERIMETER CONTROL, WIND EROSION CONTROL, TRACKING, NON-STORM WATER CONTROL, WASTE MANAGEMENT, AND MATERIALS POLLUTION CONTROL.

THE NATIONAL WEATHER SERVICE FORECAST SHALL BE MONITORED AND USED BY THE DEVELOPER ON A DAILY BASIS. IF PRECIPITATION IS PREDICTED (40% CHANCE OF RAIN), THEN THE NECESSARY WATER POLLUTION CONTROL PRACTICES SHALL BE DEPLOYED WITHIN 48 HOURS AND PRIOR TO THE ONSET OF THE PRECIPITATION.

THE DEPLOYMENT OF THE BMPs SHALL INCLUDE BUT NOT BE LIMITED TO GRAVEL BAGS AND SILT FENCES. A MINIMUM OF 125% OF THE MATERIAL NEEDED TO INSTALL STANDBY BEST MANAGEMENT PRACTICES MEASURES TO PROTECT THE EXPOSED AREAS FROM EROSION AND PREVENT SEDIMENT DISCHARGES MUST BE STORED ONSITE. AREAS THAT HAVE ALREADY BEEN PROTECTED FROM EROSION USING PHYSICAL STABILIZATION OR ESTABLISHED VEGETATION STABILIZATION BMPs AS DETERMINED BY THE CITY OF CARLSBAD ARE NOT CONSIDERED TO BE "EXPOSED" FOR THE PURPOSES OF "WEATHER TRIGGERED ACTION PLAN". AN ADEQUATE SOURCE OF EQUIPMENT AND WORKERS SHALL BE AVAILABLE FOR DEPLOYMENT OF "WEATHER TRIGGERED BMPs".

EROSION CONTROL HYDROSEEDING, PLANTING AND IRRIGATION

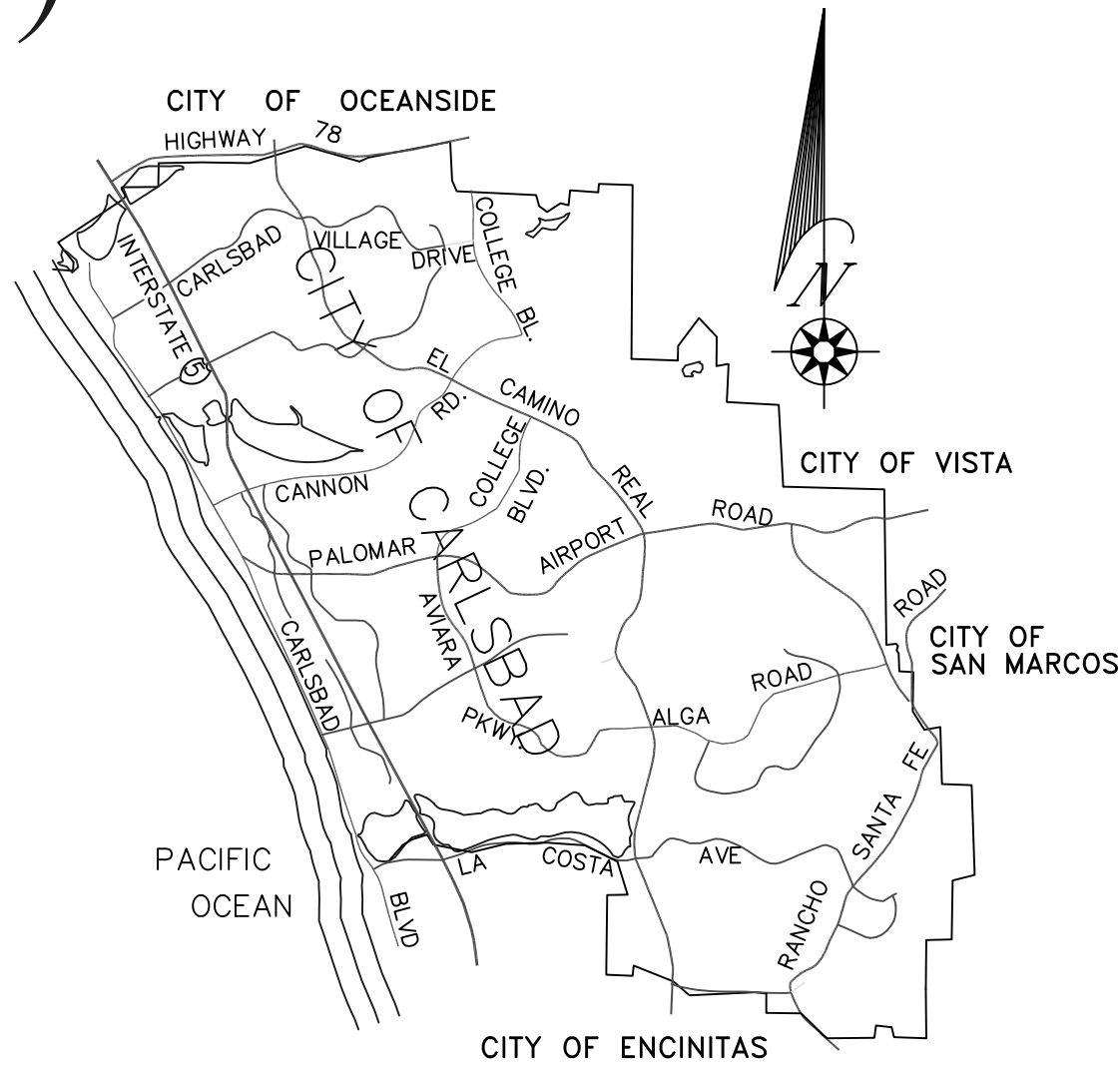
1. ALL PERMANENT AND TEMPORARY EROSION CONTROL PLANTING AND IRRIGATION SHALL BE INSTALLED AND MAINTAINED AS REQUIRED IN SECTION 212 OF THE STANDARD SPECIFICATIONS AND THE FOLLOWING:
 - A HYDROSEEDING SHALL BE APPLIED TO:
 - 1 ALL SLOPES THAT ARE GRADED 6:1 (HORIZONTAL TO VERTICAL) OR STEEPER WHEN THEY ARE:
 - a. THREE FEET OR MORE IN HEIGHT AND ADJACENT TO PUBLIC WALL OR STREET.
 - b. ALL SLOPES 4 FEET OR MORE IN HEIGHT.
 - 2 AREAS GRADED FLATTER THAN 6:1 WHEN ANY OF THE FOLLOWING CONDITIONS EXIST:
 - a. NOT SCHEDULED FOR IMPROVEMENTS (CONSTRUCTION OR GENERAL LANDSCAPING) WITHIN 60 DAYS OF ROUGH GRADING.
 - b. IDENTIFIED BY THE PARKS AND RECREATION DIRECTOR AS HIGHLY VISIBLE TO THE PUBLIC.
 - c. HAVE ANY SPECIAL CONDITION IDENTIFIED BY THE CITY ENGINEER THAT WARRANTS IMMEDIATE TREATMENT.
 - B HYDROSEEDING AREAS SHALL BE IRRIGATED IN ACCORDANCE WITH THE FOLLOWING CRITERIA:
 - 1 ALL SLOPES THAT ARE GRADED 6:1 OR STEEPER AND THAT ARE:
 - a. THREE TO EIGHT FEET IN HEIGHT SHALL BE IRRIGATED BY HAND WATERING FROM QUICK COUPLERS/HOSE BIBS OR A CONVENTIONAL SYSTEM OF LOW PRECIPITATION SPRINKLER HEADS PROVIDING 100% COVERAGE.
 - b. GREATER THAN 8 FEET IN HEIGHT SHALL BE WATERED BY A CONVENTIONAL SYSTEM OF LOW PRECIPITATION SPRINKLER HEADS PROVIDING 100% COVERAGE.
 - 2 AREAS SLOPED LESS THAN 6:1 SHALL BE IRRIGATED AS APPROVED BY THE CITY ENGINEER. PRIOR TO HYDROSEEDING, THE DEVELOPER SHALL SUBMIT A PROPOSED SCHEME TO PROVIDE IRRIGATION TO THE CITY ENGINEER. THE PROPOSAL SHALL BE SPECIFIC REGARDING THE NUMBERS, TYPE, AND COSTS OF THE ELEMENTS OF THE PROPOSED SYSTEM.
 - 3 IRRIGATION SHALL MAINTAIN THE MOISTURE LEVEL OF THE SOIL AT THE OPTIMUM LEVEL FOR THE GRADING OF THE HYDROSEEDED GROWTH.
 2. TYPE 1 MULCH APPLIED AT THE RATE OF NO LESS HAN 2000 lbs PER ACRE. TYPE 6 MULCH (STRAW) MAY BE SUBSTITUTED, WHEN STRAW IS USED, IT MUST BE ANCHORED TO THE SLOPE BY MECHANICALLY PUNCHING NO LESS THAN 50% IF THE STRAW INTO THE SOIL.
 - 3 FERTILIZER CONSISTING OF AMMONIUM PHOSPHATE SULFATE, 16-20-0 WITH 15% SULPHUR APPLIED AT THE RATE OF 500 lbs. PER ACRE.
- D AREAS TO BE HYDROSEEDED SHALL BE PREPARED PRIOR TO HYDROSEEDING:
 - 1 ROUGHENING THE SURFACE TO BE PLANTED BY ANY OR A COMBINATION OF:
 - a. TRACK WALKING SLOPES STEEPER THAN 6:1.
 - b. HARROWING AREAS 6:1 OR FLATTER THAT ARE SUFFICIENTLY FRIABLE.
 - 2 AREAS GRADED FLATTER THAN 6:1 WHEN ANY OF THE FOLLOWING CONDITIONS EXIST:
 - a. ADJUSTING THE SURFACE SOIL MOISTURE TO PROVIDE A DAMP BUT NOT SATURATED SEED BED.
 - b. THE ADDITION OF SOIL AMENOMENTS, PH ADJUSTMENT, LEACHING COVERING SALINE SOILS TO PROVIDED VIALBE CONDITIONS FOR GROWTH.
 - E HYDROSEEDING AREAS SHALL BE MAINTAINED TO PROVIDE A VIGOROUS GROWTH UNTIL THE PROJECT IS PERMANENTLY LANDSCAPED OR, FOR AREAS WHERE HYDROSEEDING IS THE PERMANENT LANDSCAPING, UNTIL THE PROJECT IS COMPLETED AND ALL BONDS RELEASED.

2. ALL SLOPES SHALL HAVE IRRIGATION INSTALLED AND BE STABILIZED, PLANTED AND/OR HYDROSEEDED WITHIN TEN (10) DAYS OF THE TIME WHEN EACH SLOPE IS BROUGHT TO GRADE AS SHOWN ON THE APPROVED GRADING PLANS.
3. SHOULD GERMINATION OF HYDROSEEDED SLOPES FAIL TO PROVIDE EFFICIENT COVERAGE OF GRADING SLOPES (90% COVERAGE) PRIOR TO OCTOBER 1, THE SLOPES SHALL BE STABILIZED BY AN APPROPRIATE EROSION CONTROL MATTING MATERIAL APPROVED BY THE PUBLIC WORKS INSPECTOR.
4. LANDSCAPING SHALL BE ACCOMPLISHED ON ALL SLOPES AND PADS AS REQUIRED BY THE CITY OF CARLSBAD LANDSCAPE MANUAL, THE LANDSCAPING PLANS FOR THIS PROJECT OR AS DIRECTED BY THE CITY ENGINEER OF PLANNING DIRECTOR.
5. THE OWNER/APPLICANT SHALL ENSURE THAT ALL CONTRACTORS SHALL COORDINATE THE WORK OF THIS CONSTRUCTION SWPPP SHOWN ON ANY GRADING PLANS, LANDSCAPE AND IRRIGATION PLANS, AND IMPROVEMENT PLANS AS REQUIRED FOR THIS PROJECT WORK.

LEGEND

(DELETE ITEMS NOT USED ON THE SITE MAP)

DESCRIPTION	SYMBOL
EC-10, VELOCITY DISSIPATION	
SE-1, SILT FENCE	
SE-5, FIBER ROLL	
SE-6, GRAVEL BAG	
TR-1, STABILIZED CONSTRUCTION ENTRANCE	
NS-8, VEHICLE AND EQUIPMENT CLEANING	NS-8
NS-9, VEHICLE AND EQUIPMENT FUELING	NS-9
NS-10, VEHICLE AND EQUIPMENT MAINTENANCE	NS-10
WM-1, MATERIAL DELIVERY AND STORAGE	WM-1
WM-2, MATERIAL USE	WM-2
WM-5, SOLID WASTE MANAGEMENT	WM-5
WM-9, SANITARY/SEPTIC WASTE MANAGEMENT	WM-9
BIORETENTION BASIN	
CONCRETE BROW DITCH	



VICINITY MAP

SHEET INDEX:

SHEET 1: TITLE SHEET
SHEET 2: EROSION CONTROL PLANS

APN: _____

SITE ADDRESS:

AREA OF DISTURBANCE

AREA OF DISTURBANCE _____ S.F.

(THIS AREA INCLUDES BUT IS NOT LIMITED TO OFF-SITE WORK INCLUDING PUBLIC IMPROVEMENTS AND TEMPORARY DISTURBANCE SUCH AS VEHICLE AND EQUIPMENT STAGING AREAS, CONSTRUCTION WORKER FOOT TRAFFIC, SOIL/GRAVEL PILES, UTILITY TRENCHES, BACKFILL CUTS AND SLOPE KEYWAYS)

CONSTRUCTION THREAT:

CONSTRUCTION THREAT TO STORM WATER QUALITY (CHECK BOX):

☐ HIGH ☐ MEDIUM

OWNER/APPLICANT:

NAME:
ADDRESS:
TELEPHONE NO.:

EMERGENCY CONTACT :

NAME:
ADDRESS:
TELEPHONE NO.:

OWNER'S CERTIFICATION:

I UNDERSTAND AND ACKNOWLEDGE THAT I MUST: (1) IMPLEMENT BEST MANAGEMENT PRACTICES (BMPs) DURING CONSTRUCTION ACTIVITIES TO THE MAXIMUM EXTENT PRACTICABLE TO AVOID THE MOBILIZATION OF POLLUTANTS SUCH AS SEDIMENT AND TO AVOID THE EXPOSURE OF STORM WATER TO CONSTRUCTION RELATED POLLUTANTS; AND (2) ADHERE TO, AND AT ALL TIMES, COMPLY WITH THIS CITY APPROVED TIER 2 CONSTRUCTION SWPPP THROUGHOUT THE DURATION OF THE CONSTRUCTION ACTIVITIES UNTIL THE CONSTRUCTION WORK IS COMPLETE AND SIGNED OFF BY THE CITY OF CARLSBAD.

OWNER(S)/ OWNER'S AGENT NAME (PRINT) _____ DATE _____

OWNER(S)/ OWNER'S AGENT NAME (SIGNATURE) _____ DATE _____

NAME OF PREPARER: _____

QUALIFICATION OF PREPARER:_____

ADDRESS: _____

PHONE NO.: _____

SIGNATURE R.C.E./CERT. NO. LIC. EXP. DATE DATE



SHEET 1	CITY OF CARLSBAD ENGINEERING DEPARTMENT	SHEETS 2
CITY STORM WATER POLLUTION PREVENTION PLAN (SWPPP) TIER 2		
PROJECT NAME:_____		
TITLE SHEET		
PROJECT ID		DRAWING NO.

TIER 2 STORM WATER POLLUTION PREVENTION PLAN (SWPPP)



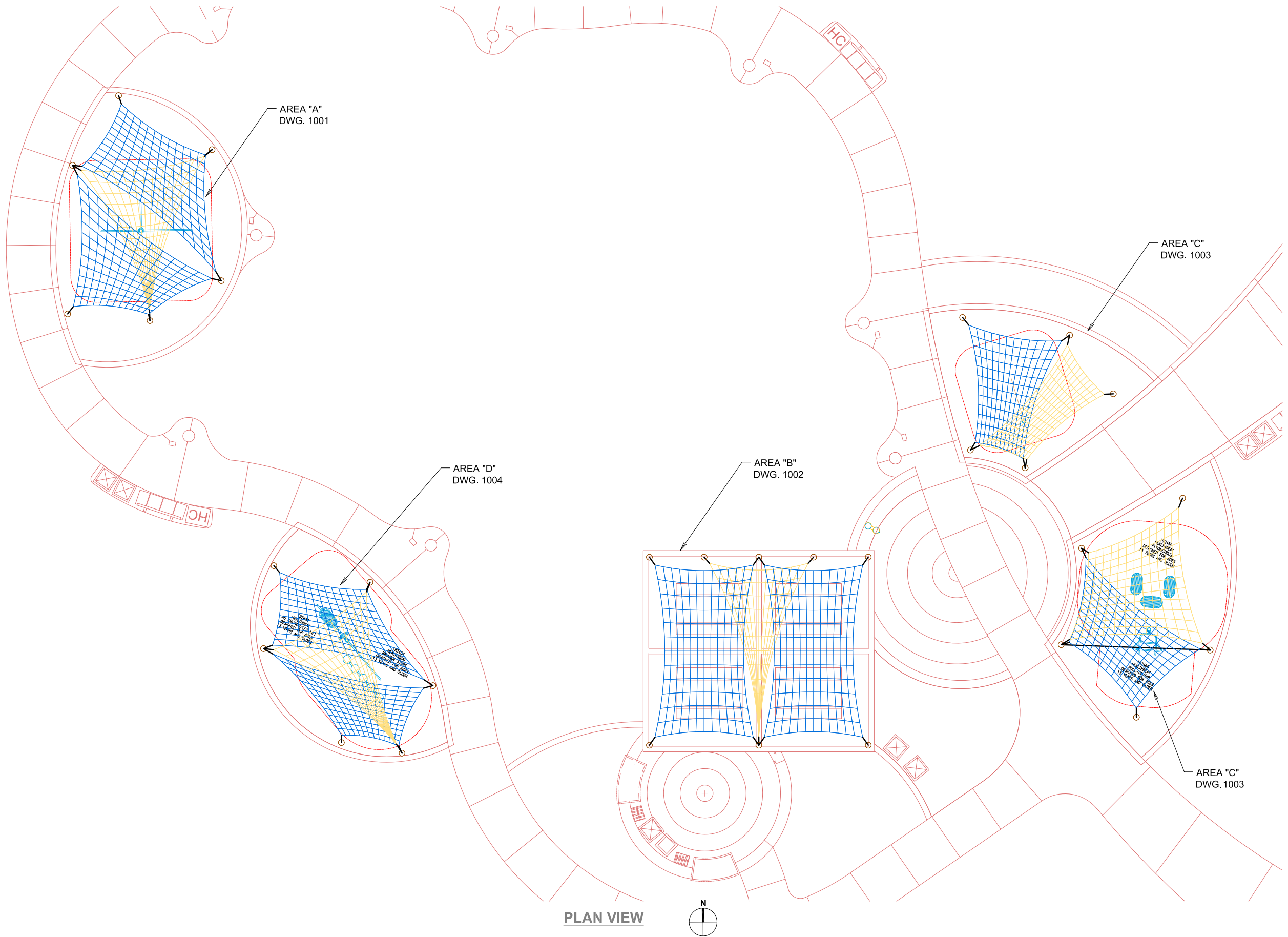
SHEET 2	CITY OF CARLSBAD ENGINEERING DEPARTMENT	SHEETS 2
STORM WATER POLLUTION PREVENTION PLAN (SWPPP) TIER 2		
PROJECT NAME: _____		
EROSION CONTROL PLAN		
DWN BY: _____	PROJECT NO. _____	DRAWING NO. _____
CHKD BY: _____		
RVWD BY: _____		

CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS

Appendix B

Shade Structure Sheets

NOTES:
-THESE DRAWINGS ARE A PICTORIAL REPRESENTATION OF FABRIC AND STEEL ONLY. NONE OF THE REQUIRED ATTACHMENT OR CONNECTION DETAILS HAVE BEEN DEPICTED.
-ALL DIMENSIONS AND HEIGHTS MUST BE FIELD VERIFIED PRIOR TO ANY FINAL DESIGN, FABRICATION OR INSTALLATION WORK.



CUSTOMER:
CITY OF CARLSBAD
PROJECT NAME:
CALAVERA NORTHEAST PARK
LOCATION:
CARLSBAD, CA
STRUCTURE TYPE:
JOINED SAILS
SIZE:
VARIES

THESE PLANS AND SPECIFICATIONS ARE THE PROPERTY OF
USA SHADE AND FABRIC STRUCTURES
AND SHALL NOT BE REPRODUCED WITHOUT THEIR WRITTEN PERMISSION.



USASHADE & Fabric Structures
CORPORATE HEADQUARTERS
2580 ESTERS BLVD., SUITE 100
DFW AIRPORT, TX 75261
800-966-5005

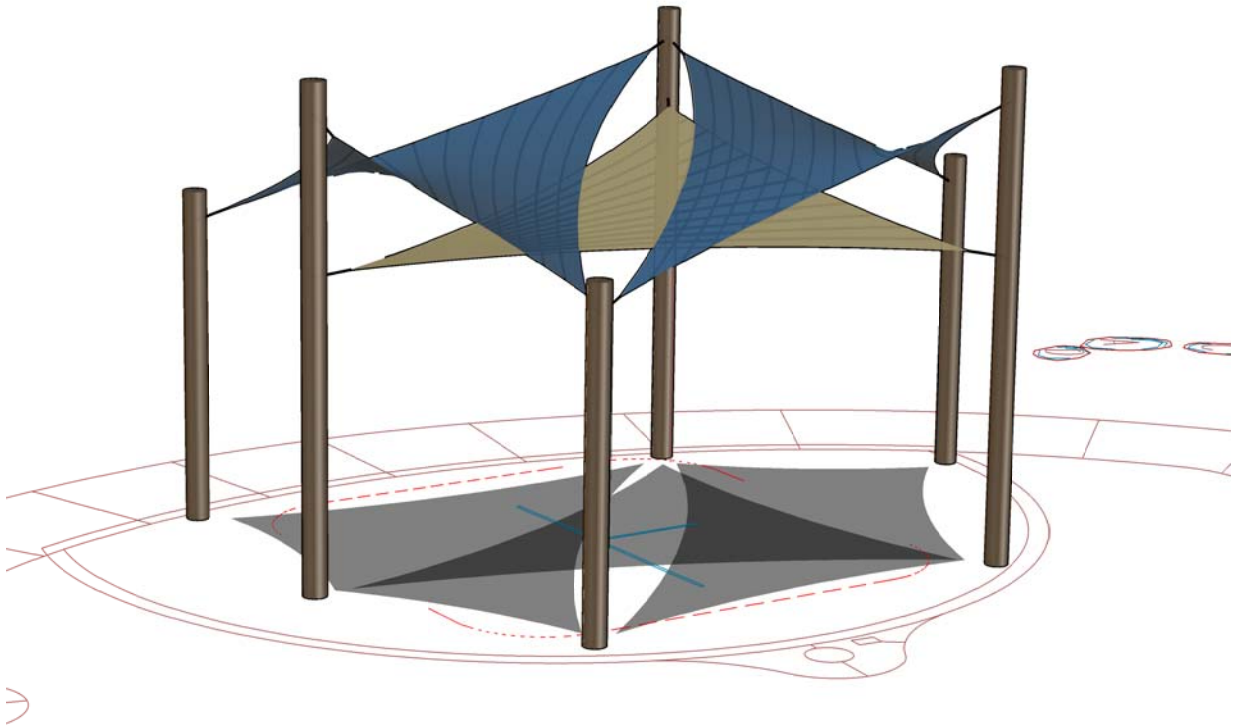
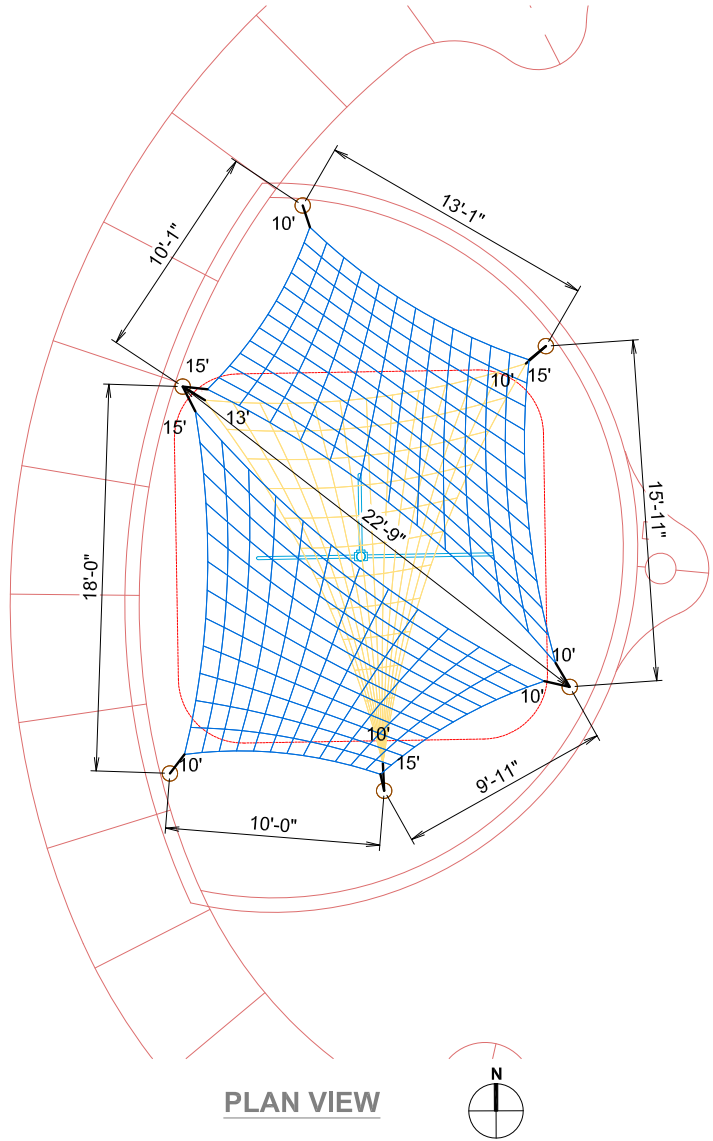
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IAS CERTIFICATION No: FA-428
CLARK COUNTY MANUFACTURER
CERTIFICATION NUMBER (NEVADA): 355

	REVISED ELEVATIONS	REVISED STRUCTURES	REVISED STRUCTURES	DESCRIPTION	DATE	DRW	CHK	ENG
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B	06/04/15	AZR	AZR					
A	04/30/15	AZR	AZR					
REV								

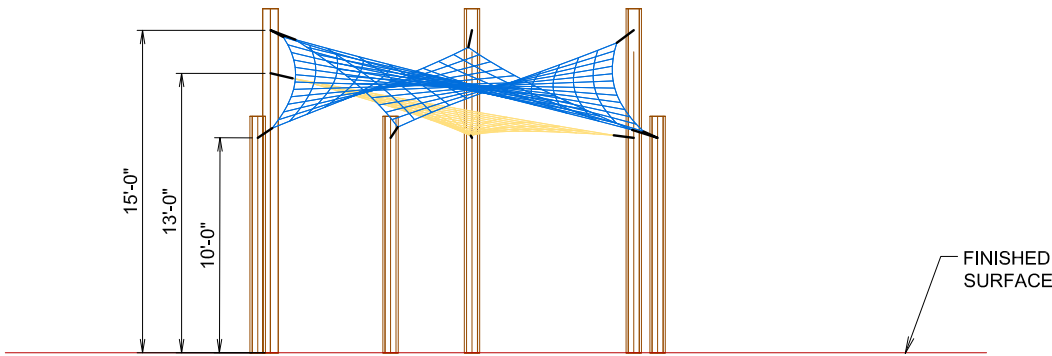
Drawn By : AZR 07/25/19
Checked By : AZR 07/25/19
Approved By : AZR 07/25/19

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DWG.
CON-FEB-021-15
PAGE
1000
REV.
C

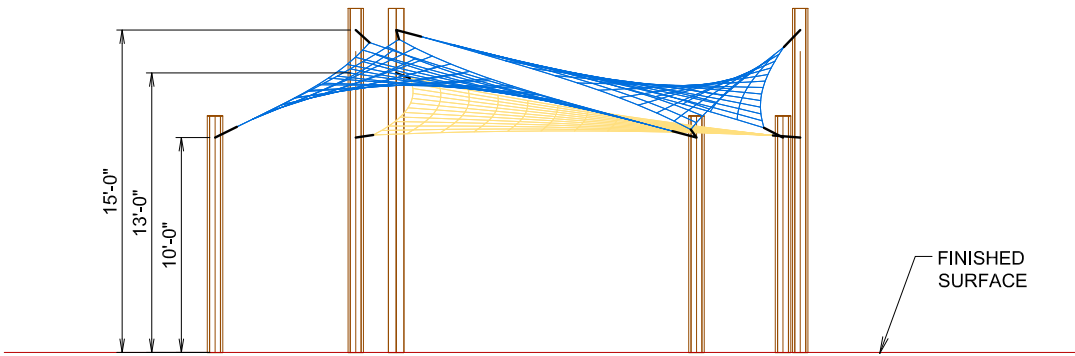
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PERSPECTIVE VIEW



SOUTH ELEVATION



WEST ELEVATION

CUSTOMER:
CITY OF CARLSBAD

PROJECT NAME:
CALAVERA NORTHEAST PARK

LOCATION:
CARLSBAD, CA

STRUCTURE TYPE:
JOINED SAILS

SIZE:
VARIES

THESE PLANS AND SPECIFICATIONS ARE THE PROPERTY OF
USA SHADE AND FABRIC STRUCTURES
AND SHALL NOT BE REPRODUCED WITHOUT THEIR WRITTEN PERMISSION.

USA SHADE & Fabric Structures
CORPORATE HEADQUARTERS
2580 ESTERS BLVD., SUITE 100
DFW AIRPORT, TX 75261
800-966-5005

CERTIFICATIONS:
IAS CERTIFICATION No: FA-428
CLARK COUNTY MANUFACTURER
CERTIFICATION NUMBER (NEVADA): 355

	REVISED ELEVATIONS	07/25/19	AZR	AZR	AZR	DATE	DRW	CHK	ENG
C	REVISED STRUCTURES	06/04/15	AZR	AZR	AZR				
B	REVISED STRUCTURES	04/30/15	AZR	AZR	AZR				
A	REVISED STRUCTURES								
REV	DESCRIPTION								

Drawn By : AZR 07/25/19

Checked By : AZR 07/25/19

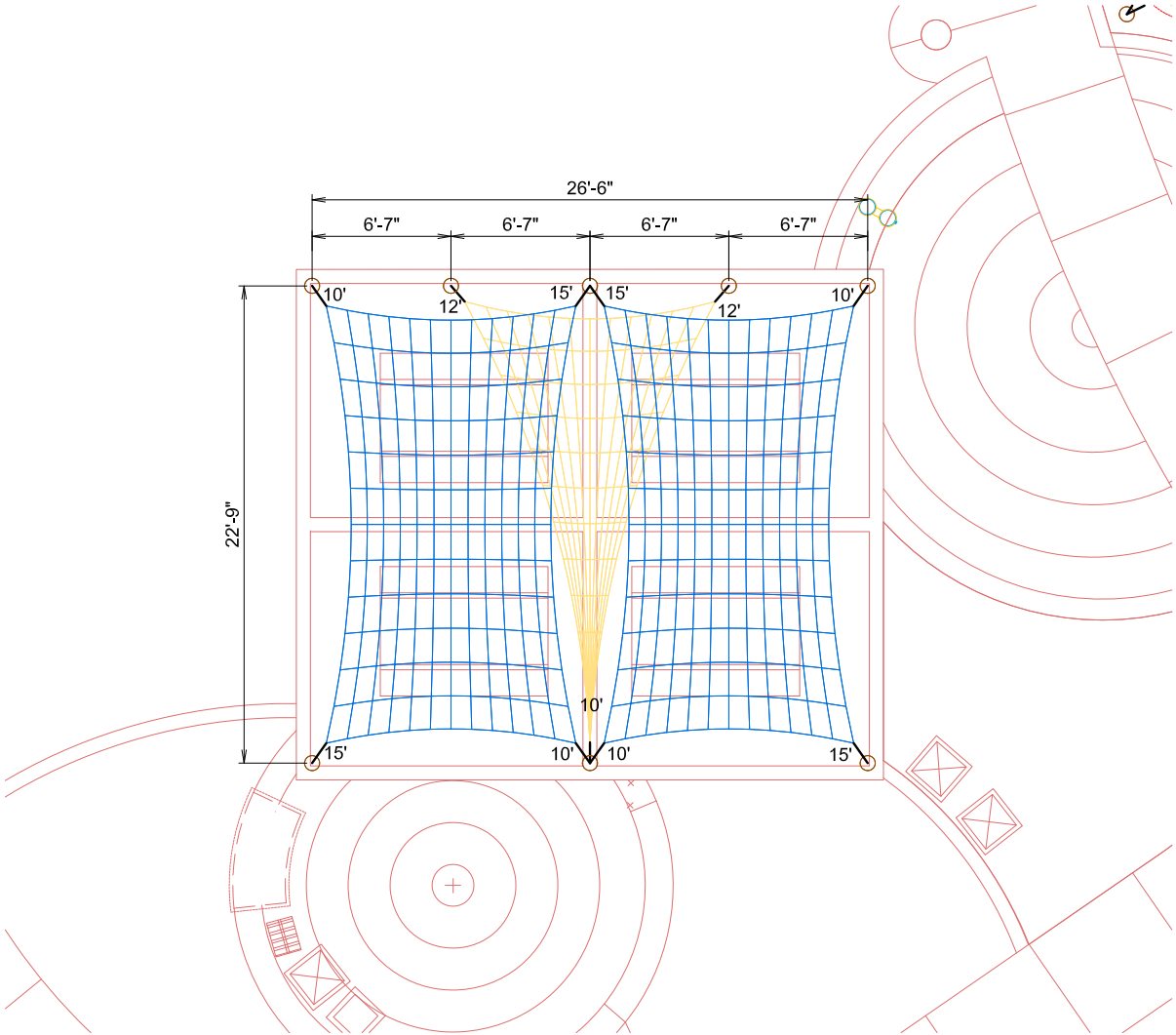
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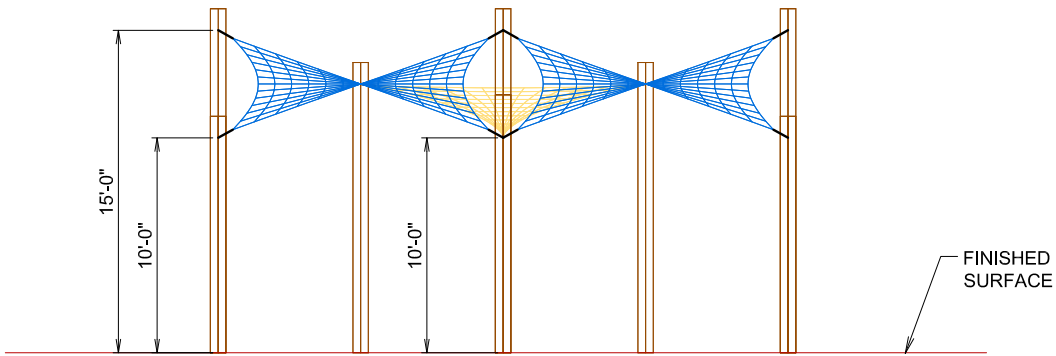
DWG.
CON-FEB-021-15

PAGE
1001

REV.
C

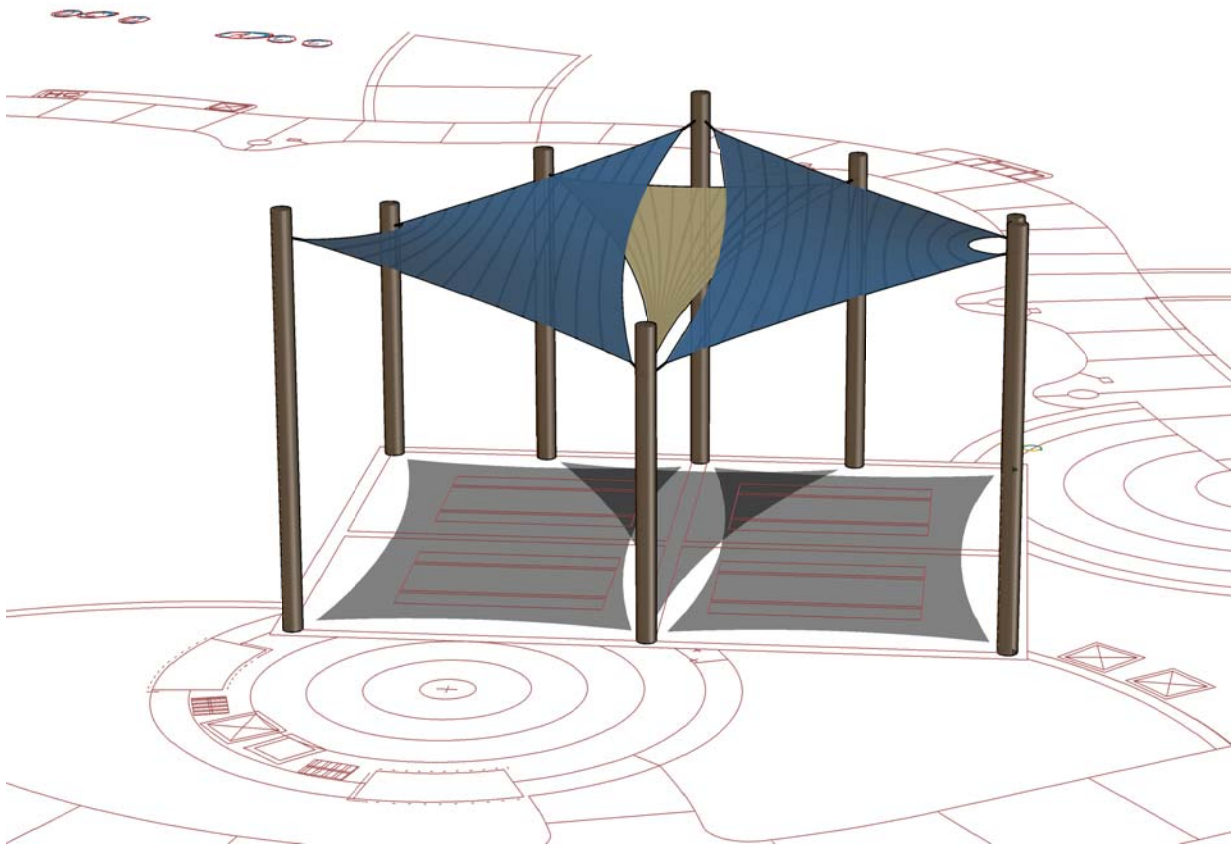


PLAN VIEW

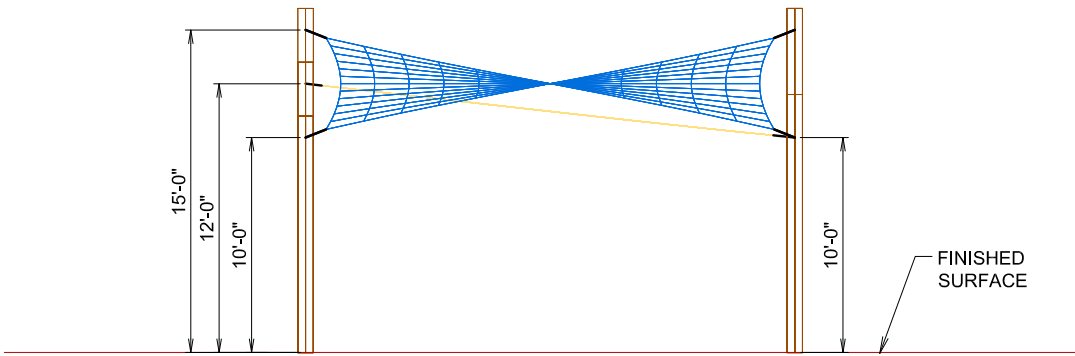


SOUTH ELEVATION

NOTES:
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-ALL DIMENSIONS AND HEIGHTS MUST BE FIELD VERIFIED PRIOR TO ANY FINAL DESIGN, FABRICATION OR INSTALLATION WORK.



PERSPECTIVE VIEW



WEST ELEVATION

CUSTOMER:

CITY OF CARLSBAD

PROJECT NAME:

CALAVERA NORTHEAST PARK

LOCATION:

CARLSBAD, CA

STRUCTURE TYPE:

JOINED SAILS

SIZE:

VARIES

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800-966-5005

CERTIFICATIONS:

IAS CERTIFICATION No: FA-428
CLARK COUNTY MANUFACTURER
CERTIFICATION NUMBER (NEVADA): 355

	REVISED ELEVATIONS	REVISED STRUCTURES	REVISED STRUCTURES	DESCRIPTION	DATE	DRW	CHK	ENG
C	07/25/19	06/04/15	04/30/15					
B								
A								
REV								

Drawn By : AZR 07/25/19

Checked By : AZR 07/25/19

Approved By : AZR 07/25/19

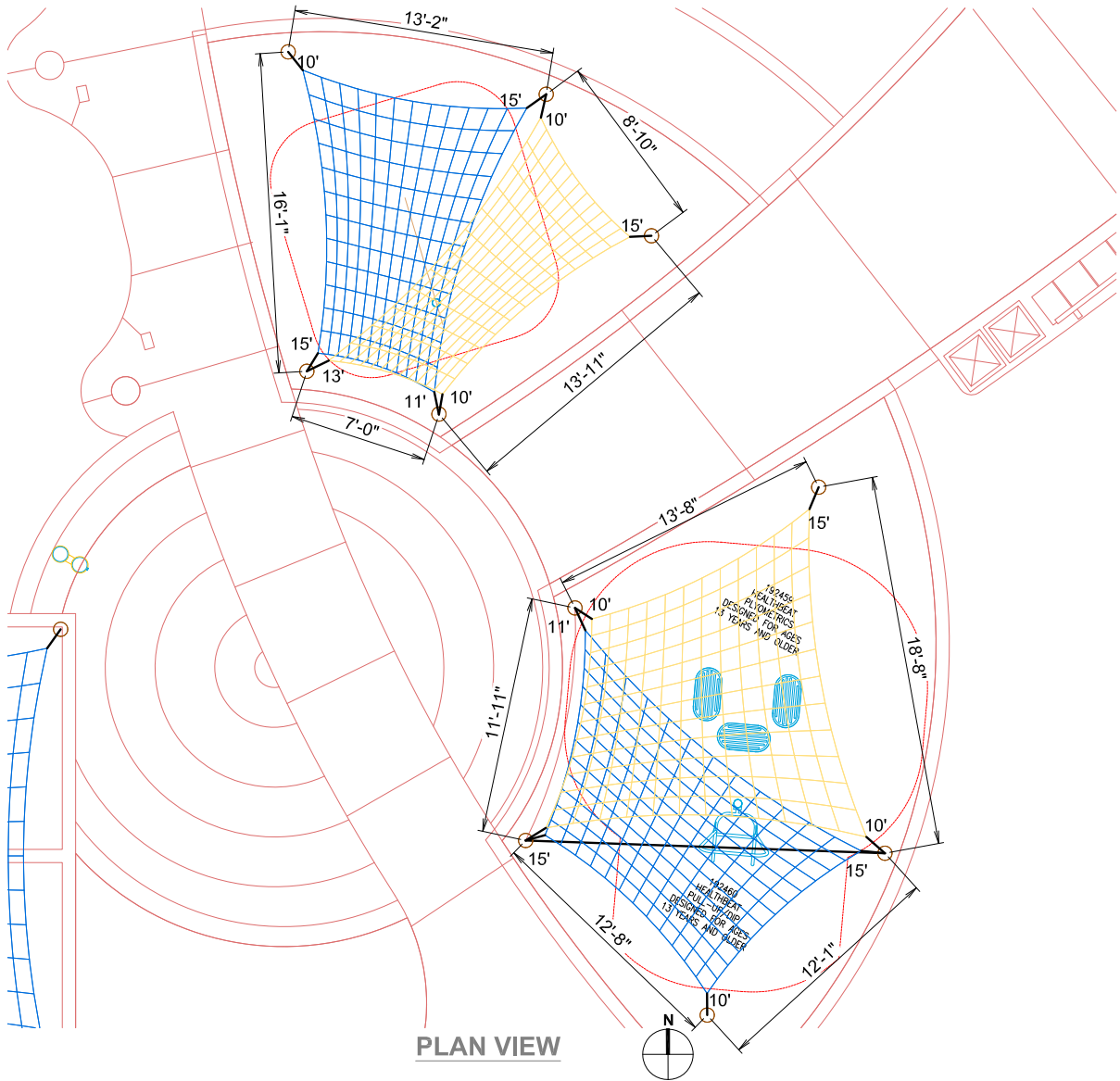
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AREA "B"

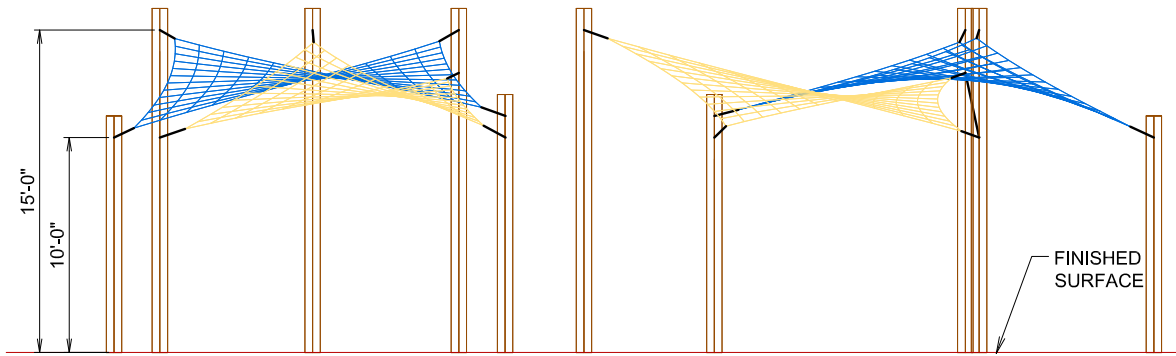
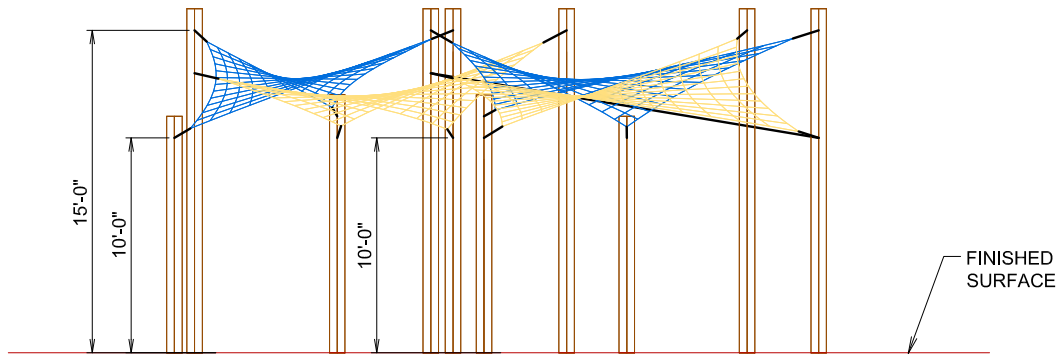
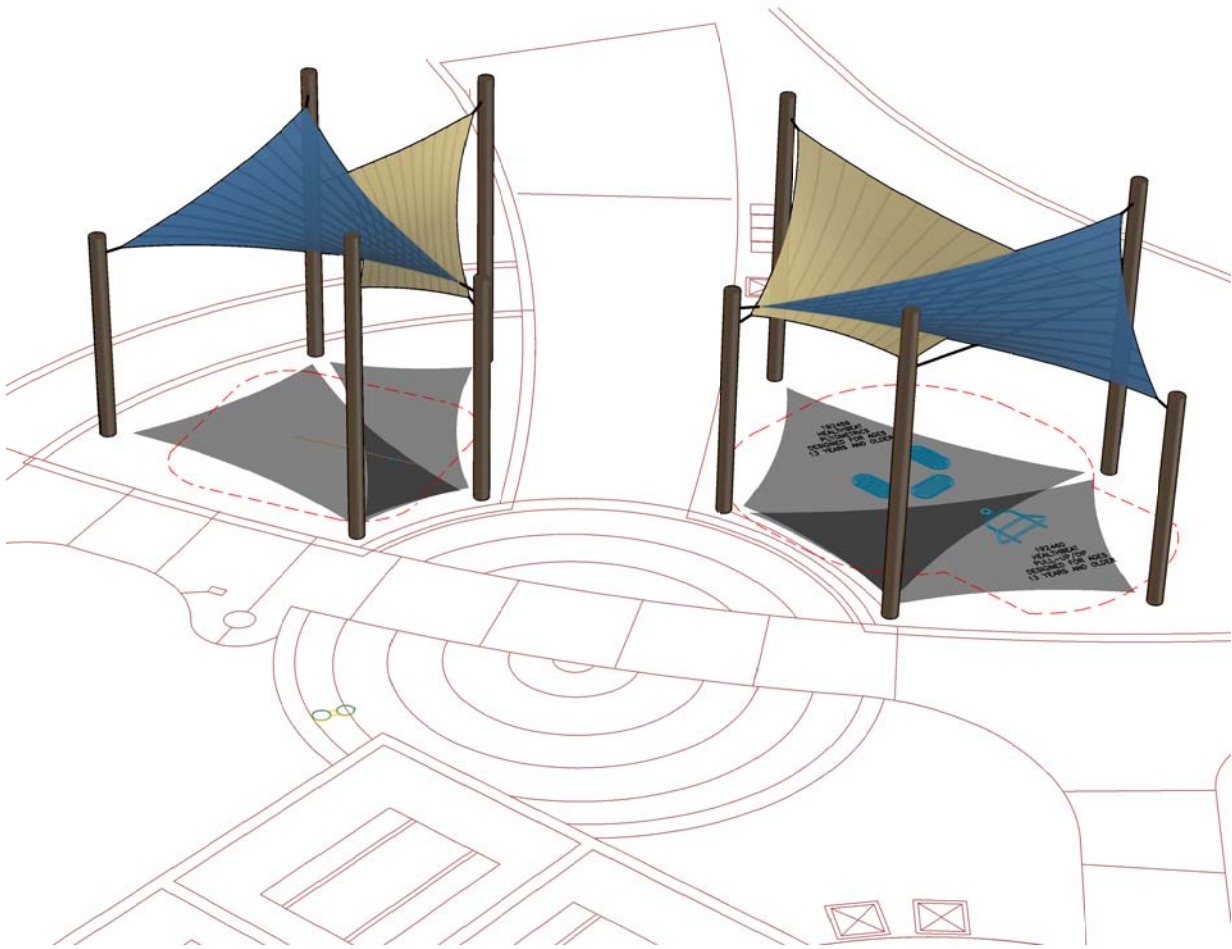
DWG. **CON-FEB-021-15**

PAGE **1002**

REV. **C**



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CUSTOMER: **CITY OF CARLSBAD**

PROJECT NAME: **CALAVERA NORTHEAST PARK**

LOCATION: **CARLSBAD, CA**

STRUCTURE TYPE: **JOINED SAILS**

SIZE: **VARIES**

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CERTIFICATIONS:
IAS CERTIFICATION No: FA-428
CLARK COUNTY MANUFACTURER
CERTIFICATION NUMBER (NEVADA): 355

REVISED ELEVATIONS	REVISED STRUCTURES	REVISED STRUCTURES	DESCRIPTION	DATE	DRW	CHK	ENG
C	B	A	REV				
				07/25/19	AZR		
				06/04/15	AZR		
				04/30/15	AZR		

Drawn By : AZR 07/25/19

Checked By : AZR 07/25/19

Approved By : AZR 07/25/19

DRAWING DESCRIPTION: **AREA "C"**

DWG. **CON-FEB-021-15**

PAGE **1003**

REV. **C**

<p>STRUCTURE TYPE:</p> <p>JOINED SAILS</p>
<p>SIZE:</p> <p>VARIES</p>

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DFW AIRPORT, TX 75261
800-966-5005

IAS CERTIFICATION No: FA-428
CLARK COUNTY MANUFACTURER
RTIFICATION NUMBER (NEVADA): 355

REV	DESCRIPTION	DATE	DRW	CHK	ENG
A	REVISED STRUCTURES	04/30/15	AZR	AZR	—
B	REVISED STRUCTURES	06/04/15	AZR	AZR	—
C	REVISED ELEVATIONS	07/25/19	AZR	AZR	—

Drawn By :	AZR	07/25/19
Checked By :	AZR	07/25/19
Approved By :	AZR	07/25/19

AREA "D"

PAGE	1004
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REV. **C**

PERSPECTIVE VIEW

SOUTH ELEVATION

WEST ELEVATION

— FINISHED
SURFACE

— FINISHED
SURFACE

CALAVERA HILLS COMMUNITY PARK GATEWAY IMPROVEMENTS

Appendix C

**Geotechnical Evaluation, Ninyo & Moore,
dated February 13, 2015**

**GEOTECHNICAL EVALUATION
CALAVERA HILLS
GATEWAY IMPROVEMENTS
CALAVERA HILLS COMMUNITY PARK
2997 GLASGOW DRIVE
CARLSBAD, CALIFORNIA**

PREPARED FOR:
City of Carlsbad
799 Pine Avenue, Suite 200
Carlsbad, California 92008

PREPARED BY:
Ninyo & Moore
Geotechnical and Environmental Sciences Consultants
5710 Ruffin Road
San Diego, California 92123

February 13, 2015
Project No. 107544007

February 13, 2015
Project No. 107544007

Ms. Kasia Trojanowska
City of Carlsbad
799 Pine Avenue, Suite 200
Carlsbad, California 92008

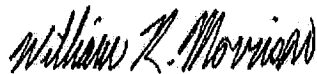
Subject: Geotechnical Evaluation
Calavera Hills Gateway Improvements
Calavera Hills Community Park
2997 Glasgow Drive
Carlsbad, California

Dear Ms. Trojanowska:

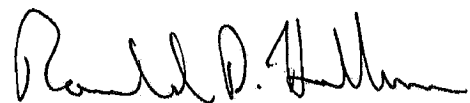
In accordance with your request and authorization, we have performed a geotechnical evaluation for the proposed Calavera Hills Gateway Improvements project in Carlsbad, California. This report presents our geotechnical findings, conclusions, and recommendations regarding the proposed project. Our report was prepared in accordance with Purchase Order No. P129450 (dated January 13, 2015).

We appreciate the opportunity to be of service on this project.

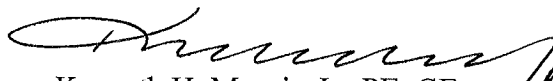
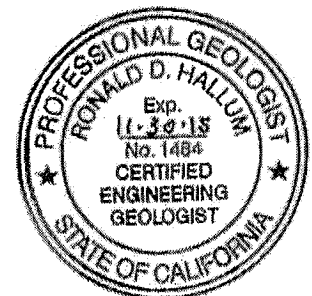
Sincerely,
NINYO & MOORE



William Morrison, PE, GE
Senior Engineer



Ronald D. Hallum, PG, CEG
Chief Engineering Geologist



Kenneth H. Mansir, Jr., PE, GE
Principal Engineer

CKV/WRM/RDH/KHM/gg

Distribution: (1) Addressee



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Figure 3 – Fault Locations
Figure 4 – Geology

Appendices

Appendix A – Test Pit Logs
Appendix B – Laboratory Testing

1. INTRODUCTION

In accordance with your request and Purchase Order No. P129450 (dated January 13, 2015), we have performed a geotechnical evaluation for the proposed Calavera Hills Gateway Improvements project in Carlsbad, California (Figure 1). The project will be constructed within the City of Carlsbad's Calavera Hills Community Park. This report presents the results of our field exploration and laboratory testing, our conclusions regarding the geotechnical conditions at the site, and our recommendations for the design and earthwork construction of this project.

2. SCOPE OF SERVICES

The scope of services for this study included the following:

- Review of readily available published and in-house geotechnical literature, preliminary site plan, topographic maps, geologic maps, fault maps, and stereoscopic aerial photographs.
- Performing a field reconnaissance to observe existing site conditions and to locate and mark proposed exploratory test pit locations.
- Performing a subsurface exploration that consisted of excavating, logging, and sampling three exploratory test pits using a backhoe. Bulk soil samples were obtained at selected intervals from the test pits. The collected samples were transported to our in-house geotechnical laboratory for analysis.
- Performing geotechnical laboratory testing on selected soil samples to evaluate soil parameters for design purposes.
- Geotechnical evaluation of field and laboratory data.
- Preparation of this report presenting our findings, conclusions, and recommendations regarding the geotechnical design and construction of the project.

3. SITE AND PROJECT DESCRIPTION

Calavera Hills Community Park is located at 2997 Glasgow Drive in the City of Carlsbad, California (Figure 1). The park is situated on an irregularly shaped parcel bounded by Carlsbad Village Drive to the north, Tamarack Avenue to the west, Glasgow Drive to the east and southeast. The park was originally graded and constructed in 1987 (Rick Engineering, 1986; Leighton & Associates, 1987).

The site of the proposed Calavera Hills Gateway Improvements project is located in the northeast corner of the park on an approximately one-half-acre, rectangular parcel. The elevation at the project site is approximately 350 feet MSL to 355 feet MSL (USGS, 2012). Topographically, the site grades gently to the northwest towards Carlsbad Village Drive. Currently, the site of the proposed improvements is vacant and ground surface consists of bare soil. An existing slope up to approximately 15 feet in height slopes down to the north up along the northern border of the site. Slopes of up to approximately 8 feet in height border the western and southern portions of the site and slope down to the southwest. The existing slopes that bound the project site are landscaped with ground cover, shrubs and trees.

Based on our conversations with representatives of the City of Carlsbad and our review of the project's conceptual plan (Wimmer, Yamada and Caughey, 2014), we understand that the proposed project will include the construction of a new park sign, a barbeque area, picnic tables, concrete seat walls and flatwork, park benches, fabric shade structures, workout equipment, and light poles.

4. PREVIOUS GEOTECHNICAL WORK

The geotechnical conditions at the subject site were previously evaluated by Leighton & Associates (1986a; 1986b) as part of the development of the existing Calavera Hills Park. At that time, the site of the Calavera Hills Gateway Improvement was originally planned to be developed with a fire station. Leighton & Associates (1986b) provided geotechnical recommendations for earthwork associated with the construction of the fire station. Rough and fine grading of the park (including that for the subject site) was subsequently performed under the observation and testing of Leighton & Associates (1987) and included remedial earthwork within the proposed building area for the fire station. Incomplete removals of undocumented fill were reportedly performed outside of the then-proposed building footprint for the fire station. The fire station was never constructed and the subject site has been vacant since it was graded.

5. SUBSURFACE EXPLORATION AND LABORATORY TESTING

Our subsurface exploration was conducted on January 16, 2015 and consisted of excavating, logging, and sampling of three exploratory test pits (TP-1 through TP-3). The test pits were excavated to approximate depths of up to 15 feet below existing grades using a backhoe. Bulk soil samples were obtained from the test pits at selected intervals. The samples were then transported to our in-house geotechnical laboratory for testing. The approximate locations of the exploratory test pits are shown on Figure 2. Test pit logs are included in Appendix A.

Geotechnical laboratory testing of representative soil samples included in-situ moisture content, gradation, expansion index, and soil corrosivity. The results of the in-situ moisture content tests are presented on the test pit logs in Appendix A. The results of the other laboratory tests performed are presented in Appendix B.

6. GEOLOGY AND SUBSURFACE CONDITIONS

Our findings regarding regional and site geology, groundwater conditions, faulting and seismicity, landslides, and other geologic hazards at the subject site are provided in the following sections.

6.1. Regional Geologic Setting

The project area is situated in the western portion of the Peninsular Ranges Geomorphic Province. This geomorphic province encompasses an area that extends approximately 900 miles from the Transverse Ranges and the Los Angeles Basin south to the southern tip of Baja California (Norris and Webb, 1990; Harden, 1998). The province varies in width from approximately 30 to 100 miles and generally consists of rugged mountains underlain by Jurassic metavolcanic and metasedimentary rocks, and Cretaceous igneous rocks of the southern California batholith. The portion of the province in western San Diego County that includes the project area consists generally of uplifted and dissected coastal plain underlain by Upper Cretaceous-, Tertiary-, and Quaternary-age sedimentary rocks.

The Peninsular Ranges Province is traversed by a group of sub-parallel faults and fault zones trending roughly northwest. Several of these faults are considered to be active. The Elsinore, San Jacinto, and San Andreas faults are active fault systems located northeast of the project area and the Rose Canyon, Coronado Bank, San Diego Trough, and San Clemente faults are active faults located west of the project area. The location of the site relative to these regional faults is shown on Figure 3. Major tectonic activity associated with these and other faults within this regional tectonic framework consists primarily of right-lateral, strike-slip movement. The Rose Canyon Fault Zone, the nearest active fault system, has been mapped approximately 7 miles west of the project site.

6.2. Site Geology

The geology of the site vicinity is shown on Figure 4. Geologic units encountered during our subsurface exploration included fill and Santiago Peak Volcanics (Kennedy and Tan, 2005). Generalized descriptions of the earth units encountered during our field reconnaissance and subsurface exploration are provided in the subsequent sections. Additional descriptions of the subsurface units are provided on the test pit logs in Appendix A. A regional geologic map is included on Figure 4.

6.2.1. Fill

Fill materials were encountered in our test pits from the ground surface to depths of up to approximately 15 feet below existing grades. These materials were observed to generally consist of various shades of brown and gray, moist, soft to firm, sandy clay with varying amounts of silt, gravel, cobble, and boulders. Boulders up to 2 feet in diameter were encountered in the fill. Additionally, scattered organic material and construction debris, including concrete pieces and wood fragments, were encountered in the fill materials.

6.2.2. Santiago Peak Volcanics

Mesozoic-age Santiago Peak Volcanics (mapped as Metasedimentary and Metavolcanic Rocks Undivided [Kennedy and Tan, 2005]) were encountered in test pits TP-2 and TP-3 underlying the fill to the total depth explored of each test pit, where refusal to the

backhoe excavating equipment was encountered at depths of 9.5 feet and 7 feet, respectively. The Santiago Peak Volcanics were observed to consist of various shades of brown, dry to moist, decomposed to moderately weathered metavolcanic rock.

6.3. Groundwater

Groundwater was not encountered in our exploratory test pits during our evaluation. While not encountered during our subsurface exploration, seepage or perched water due to infiltration from irrigation of nearby landscape areas and leakage from existing storm drains may be encountered during construction. Fluctuations in the groundwater level and perched conditions may occur due to variations in ground surface topography, subsurface geologic conditions and structure, rainfall, irrigation, and other factors.

6.4. Faulting and Seismicity

Based on our review of the referenced geologic maps and stereoscopic aerial photographs, as well as on our geologic field mapping, the subject site is not underlain by known active or potentially active faults (i.e., faults that exhibit evidence of ground displacement in the last 11,000 years and 2,000,000 years, respectively). The site is not located within a State of California Earthquake Fault (Alquist-Priolo Special Studies) Zone. However, like the majority of southern California, the site is located in a seismically active area and the potential for strong ground motion is considered significant during the design life of the proposed structures. The nearest known active fault is the Rose Canyon fault, located approximately 7 miles west of the site.

6.4.1. Strong Ground Motion

The 2013 California Building Code (CBC) specifies that the Risk-Targeted, Maximum Considered Earthquake (MCE_R) ground motion response accelerations be used to evaluate seismic loads for design of buildings and other structures. The MCE_R ground motion response accelerations are based on the spectral response accelerations for 5 percent damping in the direction of maximum horizontal response and incorporate a

target risk for structural collapse equivalent to 1 percent in 50 years with deterministic limits for near-source effects. The horizontal peak ground acceleration (PGA) that corresponds to the MCE_R for the site was calculated as 0.43g using the United States Geological Survey (USGS, 2013) seismic design tool (web-based). Spectral response acceleration parameters, consistent with the 2013 CBC, are also provided in Section 7.2. for the evaluation of seismic loads on buildings and other structures.

The 2013 CBC specifies that the potential for liquefaction and soil strength loss be evaluated, where applicable, for the Maximum Considered Earthquake Geometric Mean (MCE_G) peak ground acceleration with adjustment for site class effects in accordance with the American Society of Civil Engineers (ASCE) 7-10 Standard. The MCE_G peak ground acceleration is based on the geometric mean peak ground acceleration with a 2 percent probability of exceedance in 50 years. The MCE_G peak ground acceleration with adjustment for site class effects (PGA_M) was calculated as 0.41g using the USGS (USGS, 2013) seismic design tool that yielded a mapped MCE_G peak ground acceleration of 0.41g for the site and a site coefficient (F_{PGA}) of 1.0 for Site Class C.

6.4.2. Ground Rupture

Based on our review of the referenced literature and our field evaluation, active faults are not known to cross the project vicinity. Therefore, the potential for ground rupture due to faulting at the site is considered low. However, lurching or cracking of the ground surface as a result of nearby seismic events is possible.

6.4.3. Liquefaction and Seismically Induced Settlement

Liquefaction of cohesionless soils can be caused by strong vibratory motion due to earthquakes. Research and historical data indicate that loose granular soils and non-plastic silts that are saturated by a relatively shallow groundwater table are susceptible to liquefaction. Based on the dense nature of the Santiago Peak Volcanics encountered in our test pits and the observed absence of shallow groundwater, it is our opinion that the potential for liquefaction and seismically induced settlement to occur at the site is not a design consideration.

6.5. Landsliding and Slope Stability

Based on our review of published geologic literature and aerial photographs, along with our subsurface evaluation, landslides or indications of deep-seated slope instability do not underlie and are not adjacent to the project site.

7. CONCLUSIONS

Based on our review of the referenced background data, subsurface exploration, and laboratory testing, it is our opinion that construction of the proposed improvements for the Calavera Hills Community Park are feasible from a geotechnical standpoint provided the recommendations presented in this report are incorporated into the design and construction of the project. In general, the following conclusions were made:

- The project site is underlain by fill soils and Santiago Peak Volcanics. Portions of the fill materials are considered to be potentially compressible and are not suitable for structural support in their present condition. Recommendations for remedial earthwork are presented in the following sections.
- Groundwater was not encountered during our subsurface exploration. Fluctuations in the groundwater level may occur due to variations in ground surface topography, subsurface geologic conditions and structure, rainfall, irrigation, and other factors.
- The active Rose Canyon fault zone is located approximately 7 miles west of the site. Accordingly, the potential for relatively strong seismic ground motions should be considered in the project design.
- The existing fill soils encountered on-site should be generally excavatable with heavy-duty earth moving equipment in good working condition. Zones containing gravel, cobble and boulders may be encountered and additional efforts including heavy ripping should be anticipated. Excavations extending into portions of the fill and Santiago Peak Volcanics will generate oversize material and additional processing and handling of these materials, including screening and crushing, should be anticipated.
- Drilling of holes into the Santiago Peak Volcanics (for shade structure and light pole foundations) will be difficult and can be expected to require coring or other special drilling methods. Excavations extending into materials of the Santiago Peak Volcanics will encounter very difficult excavation conditions, and heavy ripping, coring, and/or blasting should be anticipated.

- On-site soils, other than materials with high organic content, are suitable for reuse as compacted fill, provided they meet the criteria mentioned in the fill materials section of this report.
- Moisture conditioning and screening, crushing, and/or off site disposal of oversized materials should be anticipated if on site materials are reused as fill.
- Based on the results of our limited soil corrosivity tests, ACI 318, and Caltrans (2012) criteria, the site would be classified as a corrosive site, specifically with respect to ferrous metals.

8. RECOMMENDATIONS

Based on our understanding of the project, the following recommendations are provided for the design and construction of the proposed improvements. The proposed site improvements should be constructed in accordance with the requirements of the applicable governing agencies.

8.1. Earthwork

In general, earthwork should be performed in accordance with the recommendations presented in this report. Ninyo & Moore should be contacted for questions regarding the recommendations or guidelines presented herein.

8.1.1. Site Preparation

Site preparation should begin with the removal of existing vegetation, utility lines, asphalt, concrete, and other deleterious debris from areas to be graded. Tree stumps and roots should be removed to such a depth that organic material is generally not present. Clearing and grubbing should extend to the outside of the proposed excavation and fill areas. The debris and unsuitable material generated during clearing and grubbing should be removed from areas to be graded and disposed of at a legal dumpsite away from the project area.

8.1.2. Remedial Earthwork

The existing fill materials at the site are considered potentially compressible and are not suitable to support settlement sensitive structures in their present condition. We recommend that the upper portions of the on-site fill materials be removed and replaced with compacted fill. The depth of these removals should extend 2 feet below existing grade or

one foot below the bottom of proposed shallow foundations (whichever is deeper). In general, remedial grading should extend 5 feet or more beyond the limit of the improvement, as practical. Ninyo & Moore should observe the overexcavation bottom prior to filling to evaluate the need for deeper removals. Deeper removals may be needed at specific locations if loose, compressible, or otherwise unsuitable materials are exposed or encountered during grading. The resultant removal surface should be scarified to a depth of approximately 8 inches, moisture conditioned and recompact to a relative compaction of 90 percent as evaluated by the ASTM International (ASTM) Test Method D 1557 prior to placing new fill. Subsequent to recompaction of the removal surface, the overexcavation should be backfilled with compacted fill placed in accordance with the recommendations contained in Section 7.1.6.

8.1.3. Temporary Excavations

For temporary excavations, we recommend that the following Occupational Safety and Health Administration (OSHA) soil classifications be used:

<i>Fill</i>	<i>Type C</i>
<i>Santiago Peak Volcanics</i>	<i>Type B</i>

Upon making the excavations, the soil classifications and excavation performance should be evaluated in the field by the geotechnical consultant in accordance with the OSHA regulations. Temporary excavations should be constructed in accordance with OSHA recommendations. For trenches or other excavations, OSHA requirements regarding personnel safety should be met using appropriate shoring (including trench boxes) or by laying back the slopes to no steeper than 1.5:1 (horizontal: vertical) in engineered fill and 1:1 in Santiago Peak Volcanics. Temporary excavations that encounter seepage may be shored or stabilized by placing sandbags or gravel along the base of the seepage zone. Excavations encountering seepage should be evaluated on a case-by-case basis. On-site safety of personnel is the responsibility of the contractor.

8.1.4. Excavation Characteristics

The results of our field exploration program indicate that the project site, as presently proposed, is underlain by fill soils and Santiago Peak Volcanics. The fill soils should be generally excavatable with heavy-duty earth moving equipment in good working condition. Zones containing gravel, cobble, and boulders may be encountered and additional efforts including heavy ripping should be anticipated. Excavations extending into materials of the Santiago Peak Volcanics will encounter very difficult excavation conditions, and the contractor should be prepared to utilize heavy ripping, coring equipment, and/or blasting methods. Excavations (including utility trenches) extending into portions of the fill and Santiago Peak Volcanics will generate oversize material and additional processing and handling of these materials including screening and crushing should be anticipated. Drilling of holes within the Santiago Peak Volcanics can also be expected to be difficult and may require the use of specialized equipment (such as core barrels) to advance to design depths.

8.1.5. Materials for Fill

Materials for fill may be obtained from on-site excavations or they may be imported. On-site soils with an organic content of less than approximately 3 percent by volume (or 1 percent by weight), and expansion indices (EI) less than 50, are suitable for reuse as general fill material. Fill material should not contain rocks or lumps over approximately 3 inches in diameter, and not more than approximately 30 percent larger than $\frac{3}{4}$ inch. Oversize materials (greater than 3 inches in largest diameter), if encountered, should be separated from material to be used for compacted fill and removed from the site. Moisture conditioning (including drying) of existing on-site materials is anticipated if reused as fill.

Imported fill materials should generally be granular soils with very low to low expansion potential (i.e., an expansion index of 50 or less as evaluated by ASTM D 4829). Imported fill material should also be tested for corrosive potential and exhibit a minimum resistivity value greater than 1,000 ohm-centimeters, chloride content of less than 500 parts per million (ppm), a sulfate content of less than 1,000 ppm and pH greater than 5.5. The contractor should be responsible for the uniformity of import material

brought to the site. We recommend that materials proposed for use as import fill be evaluated from a contractor's stockpile rather than in place materials. Utility trench backfill material, outside the zone defined in the following sections, should not contain rocks or lumps over approximately 3 inches in general. In general, soils classified as silts or clays should not be used for backfill in the pipe zone. Larger chunks, if generated during excavation, may be broken into acceptably sized pieces or disposed of offsite.

8.1.6. Compacted Fill

Prior to placement of compacted fill, the contractor should request an evaluation of the exposed ground surface by Ninyo & Moore. Unless otherwise recommended, the exposed ground surface should then be scarified to a depth of approximately 8 inches and watered or dried, as needed, to achieve moisture contents generally above the optimum moisture content. The scarified materials should then be compacted to a relative compaction of 90 percent as evaluated in accordance with ASTM D 1557. The evaluation of compaction by the geotechnical consultant should not be considered to preclude any requirements for observation or approval by governing agencies. It is the contractor's responsibility to notify this office and the appropriate governing agency when project areas are ready for observation, and to provide reasonable time for that review.

Fill materials should be moisture conditioned to generally above the laboratory optimum moisture content prior to placement. The optimum moisture content will vary with material type and other factors. Moisture conditioning of fill soils should be generally consistent within the soil mass.

Prior to placement of additional compacted fill material following a delay in the grading operations, the exposed surface of previously compacted fill should be prepared to receive fill. Preparation may include scarification, moisture conditioning, and recompaction.

Compacted fill should be placed in horizontal lifts of approximately 8 inches in loose thickness. Prior to compaction, each lift should be watered or dried as needed to achieve a moisture content generally above the laboratory optimum, mixed, and then compacted by mechanical methods to a relative compaction of 90 percent as evaluated by ASTM D 1557. Successive lifts should be treated in a like manner until the desired finished grades are achieved.

8.1.7. Utility Trench Backfill

Based on our subsurface evaluation, the on-site earth materials should be generally suitable for re-use as trench backfill provided they are free of organic material, clay lumps, debris, and rocks greater than approximately 3 inches in diameter. Larger chunks, if generated during excavation, may be broken into acceptably sized pieces or disposed of off site. Soils classified as silts or clays should not be used for backfill in the pipe zone. Fill should be moisture-conditioned to generally above the laboratory optimum. Trench backfill should be compacted to a relative compaction of 90 percent as evaluated by ASTM D 1557 except for the upper 12 inches of the backfill below pavements that should be compacted to a relative compaction of 95 percent as evaluated by ASTM D 1557. Lift thickness for backfill will depend on the type of compaction equipment utilized, but fill should generally be placed in lifts not exceeding 8 inches in loose thickness. Special care should be exercised to avoid damaging the pipe during compaction of the backfill.

8.2. Seismic Design Parameters

Design of the proposed improvements should be performed in accordance with the requirements of governing jurisdictions and applicable building codes. Table 1 presents the seismic design parameters for the site in accordance with the CBC (2013) guidelines and adjusted MCE_R spectral response acceleration parameters (USGS, 2013).

Table 1 – 2013 California Building Code Seismic Design Criteria

Site Coefficients and Spectral Response Acceleration Parameters	Values
Site Class	D
Site Coefficient, F_a	1.000
Site Coefficient, F_v	1.387
Mapped Spectral Response Acceleration at 0.2-second Period, S_s	1.070 g
Mapped Spectral Response Acceleration at 1.0-second Period, S_1	0.413 g
Spectral Response Acceleration at 0.2-second Period Adjusted for Site Class, S_{MS}	1.070 g
Spectral Response Acceleration at 1.0-second Period Adjusted for Site Class, S_{M1}	0.573 g
Design Spectral Response Acceleration at 0.2-second Period, S_{DS}	0.713 g
Design Spectral Response Acceleration at 1.0-second Period, S_{D1}	0.382 g

8.3. Foundations

The proposed improvements may be supported on shallow, spread, or continuous footings bearing on compacted fill. Foundations should be designed in accordance with structural considerations and the following recommendations. In addition, requirements of the appropriate governing jurisdictions and applicable building codes should be considered in the design of the structures.

8.3.1. Bearing Capacity

Shallow, spread, or continuous footings bearing on compacted fill may be designed using an allowable bearing capacity of 1,500 pounds per square foot (psf). These allowable bearing capacities may be increased by one-third when considering loads of short duration such as wind or seismic forces. These allowable bearing capacities are based on a factor of safety of roughly three.

Spread footings should be founded 18 inches below the lowest adjacent grade. Continuous footings should have a width of 15 inches and isolated spread footings should be 24 inches in width. The spread footings should be reinforced in accordance with the recommendations of the project structural engineer.

8.3.2. Lateral Resistance

For resistance of footings to lateral loads bearing on compacted fill, we recommend an allowable passive pressure of 100 psf of depth be used with a value of up to 1,000 psf. This value assumes that the ground is horizontal for a distance of 10 feet, or three times the height generating the passive pressure, whichever is greater. We recommend that the upper 1 foot of soil not protected by pavement or a concrete slab be neglected when calculating passive resistance.

For sliding resistance to lateral loads, we recommend a cohesion of 130 psf be used between soil and concrete. The allowable lateral resistance can be taken as the sum of the sliding resistance (cohesion value multiplied by the contact area) and passive resistance provided the passive resistance does not exceed one-half of the total allowable resistance. The passive resistance values may be increased by one-third when considering loads of short duration such as wind or seismic forces.

8.3.3. Static Settlement

We estimate that the proposed structures, designed and constructed as recommended herein, and founded in compacted fill will undergo total settlement on the order of 1 inch. Differential settlement on the order of ½ inch over a horizontal span of 40 feet can be expected.

8.3.4. Shade Structure and Light Pole Foundations

The shade structures should be supported on cast-in-drilled-hole piles. Shade structures typically impose relatively light axial loads on foundations. Although we anticipate that pile dimensions will be generally controlled by the lateral or uplift load demand, we recommend that drilled shade structure foundations have a diameter of 12 inches or more. The pile dimensions (i.e., diameter and embedment) should be evaluated by the project structural engineer.

The drilled pile construction should be observed by Ninyo & Moore during drilling to evaluate if the piles have been extended to the design depths. The drilled holes should be cleaned of loose soil and gravel. It is the contractor's responsibility to (a) take appropriate measures for maintaining the integrity of the drilled holes, (b) see that the holes are cleaned and straight, and (c) see that sloughed loose soil is removed from the bottom of the hole prior to the placement of concrete. Drilled piles should be checked for alignment and plumbness during installation. The amount of acceptable misalignment of a pile is approximately 3 inches from the plan location. It is usually acceptable for a pile to be out of plumb by 1 percent of the depth of the pile. The center-to-center spacing of piles should be no less than three times the nominal diameter of the pile.

As discussed herein, foundations will experience difficult drilling conditions. In addition, portions of the fill are anticipated to contain cobbles and boulders. In these materials, specialized drilling methods (such as the use of core barrels or air rotary drilling equipment) may be needed to advance the holes to the desired depths.

For resistance of shade structure foundations to lateral loads, we recommend an allowable passive pressure of 200 psf per foot of depth be used with a value of up to 2,000 psf within the fill soils. Where the foundations extend into the Santiago Peak Volcanics, an allowable passive resistance of 400 psf per foot of embedment can be used with a value of up to 4,000 psf. These values assume that the shade structures are designed to tolerate ½ inch of deflection at the surface and that the ground is horizontal for a distance of 10 feet, or three times the height generating the passive pressure, whichever is greater. We recommend that the upper 1 foot of soil not protected by pavement or a concrete slab be neglected when calculating passive resistance.

For sliding resistance to lateral loads, we recommend a cohesion of 130 psf be used between fill soils and concrete, and a coefficient of friction of 0.35 between the Santiago Peak Volcanics and concrete. The allowable lateral resistance can be taken as the sum of the sliding resistance (cohesion value multiplied by the contact area) and passive resistance provided the passive resistance does not exceed one-half of the total allowable

resistance. The passive resistance values may be increased by one-third when considering loads of short duration such as wind or seismic forces.

8.4. Concrete Flatwork

Exterior concrete flatwork should be 4 inches in thickness for pedestrian pavements and 5 inches in thickness for light duty vehicular pavement, and should be reinforced with No. 3 reinforcing bars placed at 24 inches on-center both ways. Exterior slabs should be underlain by 4 inches of clean sand. To reduce the potential manifestation of distress to exterior concrete flatwork due to movement of the underlying soil, we recommend that such flatwork be installed with crack-control joints at appropriate spacing as designed by the structural engineer. Before placement of concrete, the subgrade soils should be scarified to a depth of 12 inches, moisture conditioned to generally above the laboratory optimum moisture content, and compacted to a relative compaction of 90 percent as evaluated by ASTM D 1557. Positive drainage should be established and maintained adjacent to flatwork. Recommendations for flexible or rigid pavement sections can be provided upon request.

8.5. Corrosion

Laboratory testing was performed on representative samples of the on-site earth materials to evaluate pH and electrical resistivity, as well as chloride and sulfate contents. The pH and electrical resistivity tests were performed in accordance with CT 643 and the sulfate and chloride content tests were performed in accordance with CT 417 and CT 422, respectively. These laboratory test results are presented in Appendix B.

The results of the corrosivity testing indicated electrical resistivity of 700 ohm-cm, soil pH of 7.2, chloride content of 780 ppm, and sulfate content of 0.030 percent (i.e., 300 ppm). Based on the American Concrete Institute (ACI) 318 and Caltrans corrosion (2012) criteria, the site would be classified as a corrosive site, particularly with respect to ferrous metals. Corrosive soils are generally defined as soils with electrical resistivities less than 1,000 ohm-cm, more than 500 ppm chlorides, more than 0.2 percent sulfates, or a pH less than 5.5.

8.6. Concrete

Concrete in contact with soil or water that contains high concentrations of soluble sulfates can be subject to chemical deterioration. Laboratory testing indicated a sulfate content of the sample tested of 0.030 percent (i.e., 300 ppm). According to the ACI 318, the potential for sulfate attack is negligible for water-soluble sulfate content of up to about 0.10 percent by weight (i.e., 1,000 ppm) in soils. Therefore, the site soils may be considered to have a negligible potential for sulfate attack. Based on ACI criteria, Type II cement may be used for concrete construction. However, due to the potential variability of site soils, consideration should be given to using Type II/V cement and concrete with a water-cement ratio no higher than 0.45 by weight for normal weight aggregate concrete for the project.

8.7. Drainage

Pad and slope drainage should be conveyed such that runoff water is diverted away from slopes and structures to suitable discharge areas by nonerodible devices (e.g., gutters, downspouts, concrete swales, etc.). Positive drainage adjacent to structures should be established and maintained. Positive drainage may be accomplished by providing drainage away from the foundations of the structure at a gradient of 5 percent or steeper for a distance of 10 feet or more outside the building perimeter, or 2 percent or steeper for a distance of 10 feet or more outside the building perimeter if paved. Drainage should be further maintained by a graded swale leading to an appropriate outlet, in accordance with the recommendations of the project civil engineer and/or landscape architect.

Surface drainage on the site should be provided so that water is not permitted to pond. A gradient of 2 percent or steeper should be maintained over the pad area and drainage patterns should be established to divert and remove water from the site to appropriate outlets.

Care should be taken by the contractor during final grading to preserve any berms, drainage terraces, interceptor swales or other drainage devices of a permanent nature on or adjacent to the property. Drainage patterns established at the time of final grading should be maintained for the life of the project. The property owner and the maintenance personnel should be made aware that altering drainage patterns might be detrimental to slope stability and foundation performance.

8.8. Pre-Construction Conference

We recommend that a pre-construction meeting be held prior to commencement of grading. The owner or his representative, the agency representatives, the architect, the civil engineer, Ninyo & Moore, and the contractor should attend to discuss the plans, the project, and the proposed construction schedule.

8.9. Plan Review and Construction Observation

The conclusions and recommendations presented in this report are based on analysis of observed conditions in widely spaced exploratory test pits. If conditions are found to vary from those described in this report, Ninyo & Moore should be notified, and additional recommendations will be provided upon request. Ninyo & Moore should review the final project drawings and specifications prior to the commencement of construction. Ninyo & Moore should perform the needed observation and testing services during construction operations.

The recommendations provided in this report are based on the assumption that Ninyo & Moore will provide geotechnical observation and testing services during construction. In the event that it is decided not to utilize the services of Ninyo & Moore during construction, we request that the selected consultant provide the client with a letter (with a copy to Ninyo & Moore) indicating that they fully understand Ninyo & Moore's recommendations, and that they are in full agreement with the design parameters and recommendations contained in this report. Construction of proposed improvements should be performed by qualified subcontractors utilizing appropriate techniques and construction materials.

9. LIMITATIONS

The field evaluation, laboratory testing, and geotechnical analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions

not observed or described in this report may be encountered during construction. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation will be performed upon request. Please also note that our evaluation was limited to assessment of the geotechnical aspects of the project, and did not include evaluation of structural issues, environmental concerns, or the presence of hazardous materials.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report is intended for design purposes only. It does not provide sufficient data to prepare an accurate bid by contractors. It is suggested that the bidders and their geotechnical consultant perform an independent evaluation of the subsurface conditions in the project areas. The independent evaluations may include, but not be limited to, review of other geotechnical reports prepared for the adjacent areas, site reconnaissance, and additional exploration and laboratory testing.

Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions. If geotechnical conditions different from those described in this report are encountered, our office should be notified, and additional recommendations, if warranted, will be provided upon request. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

10. REFERENCES

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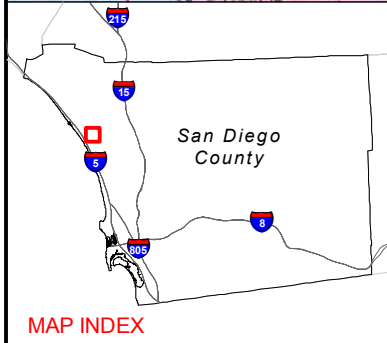
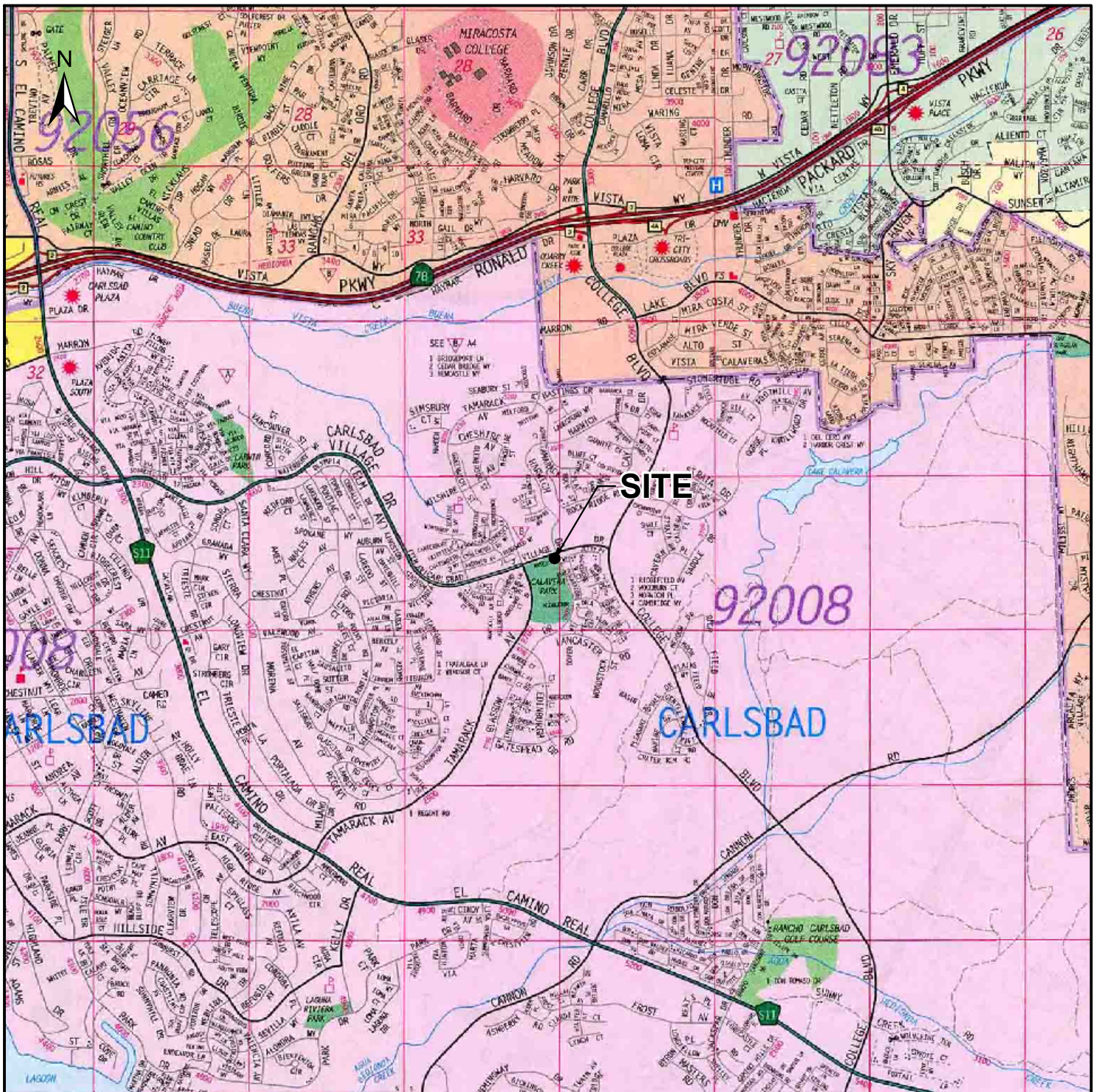
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AERIAL PHOTOGRAPHS				
Source	Date	Flight	Numbers	Scale
USDA	April 11, 1953	AXN-8M	103 and 104	1:24,000



SOURCE: 2008 THOMAS GUIDE FOR SAN DIEGO COUNTY, STREET GUIDE AND DIRECTORY; MAP © RAND MCNALLY, R.L.07-S-129

SCALE IN FEET

0 1,200 2,400 4,800

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE

MAP INDEX

Ninyo & Moore

PROJECT NO.

DATE

107544007

2/15

SITE LOCATION

CALAVERA HILLS GATEWAY IMPROVEMENTS
2997 GLASGOW DRIVE
CARLSBAD, CALIFORNIA


FIGURE

1



SOURCE: 2012 SAN DIEGO IMAGERY ACQUISITION PARTNERSHIP (FLIGHT DATES: MAY 20 - JUNE 6, 2012)

LEGEND

 **TP-3** TEST PIT
 TD=7.0 TD=TOTAL DEPTH IN FEET



SCALE IN FEET



NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE

Ninyo & Moore

TEST PIT LOCATIONS

FIGURE

2

2_107544007_TPL.mxd AOB

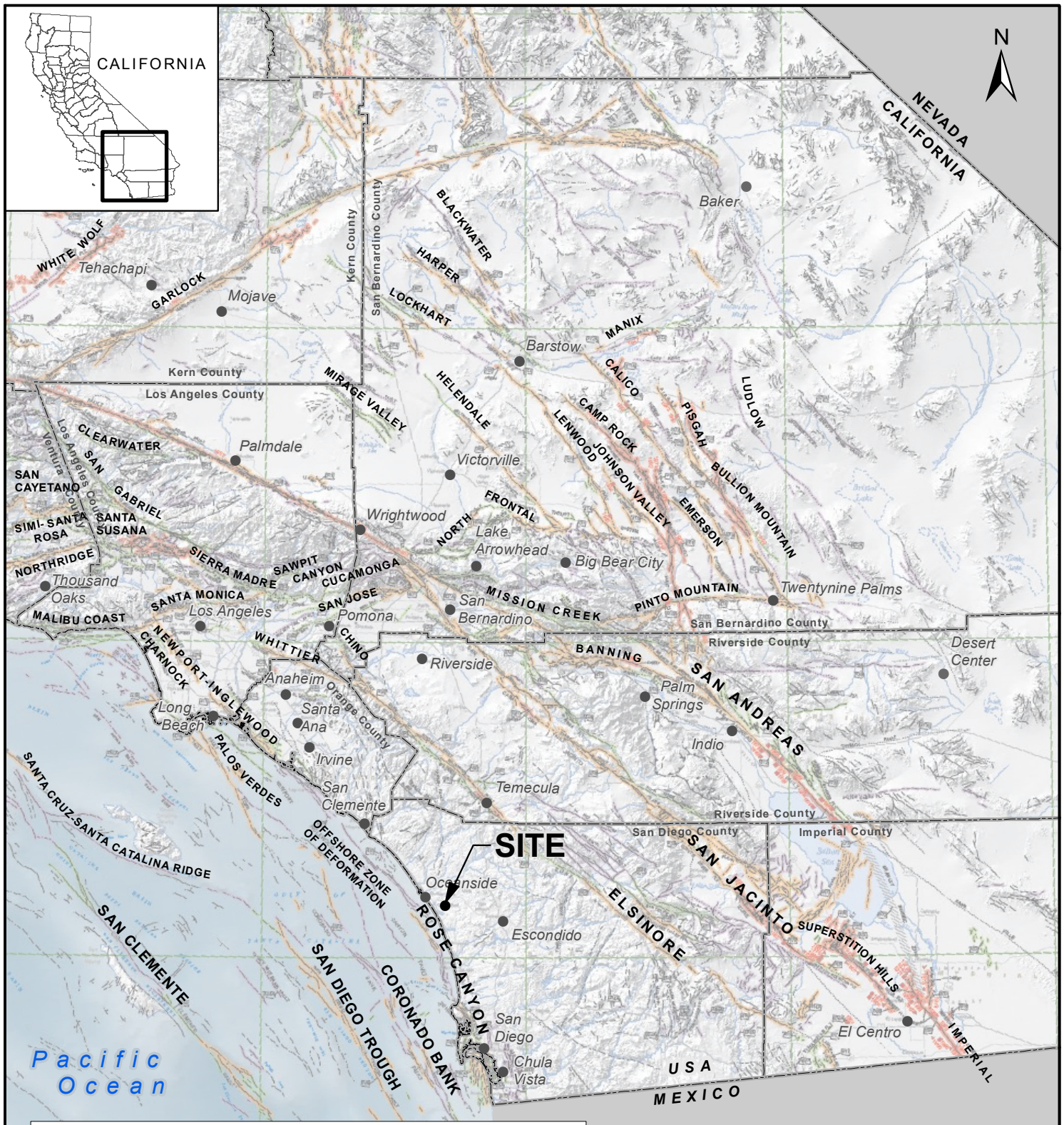
PROJECT NO.

DATE

CALAVERA HILLS GATEWAY IMPROVEMENTS
 2997 GLASGOW DRIVE
 CARLSBAD, CALIFORNIA

107544007

2/15



SOURCE: JENNINGS, C.W., AND BRYANT, W.A., 2010, FAULT ACTIVITY MAP OF CALIFORNIA, CALIFORNIA GEOLOGICAL SURVEY.

LEGEND

CALIFORNIA FAULT ACTIVITY

- HISTORICALLY ACTIVE
- HOLOCENE ACTIVE
- LATE QUATERNARY (POTENTIALLY ACTIVE)
- QUATERNARY (POTENTIALLY ACTIVE)
- STATE/COUNTY BOUNDARY

SCALE IN MILES



NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore

FAULT LOCATIONS

FIGURE

PROJECT NO.

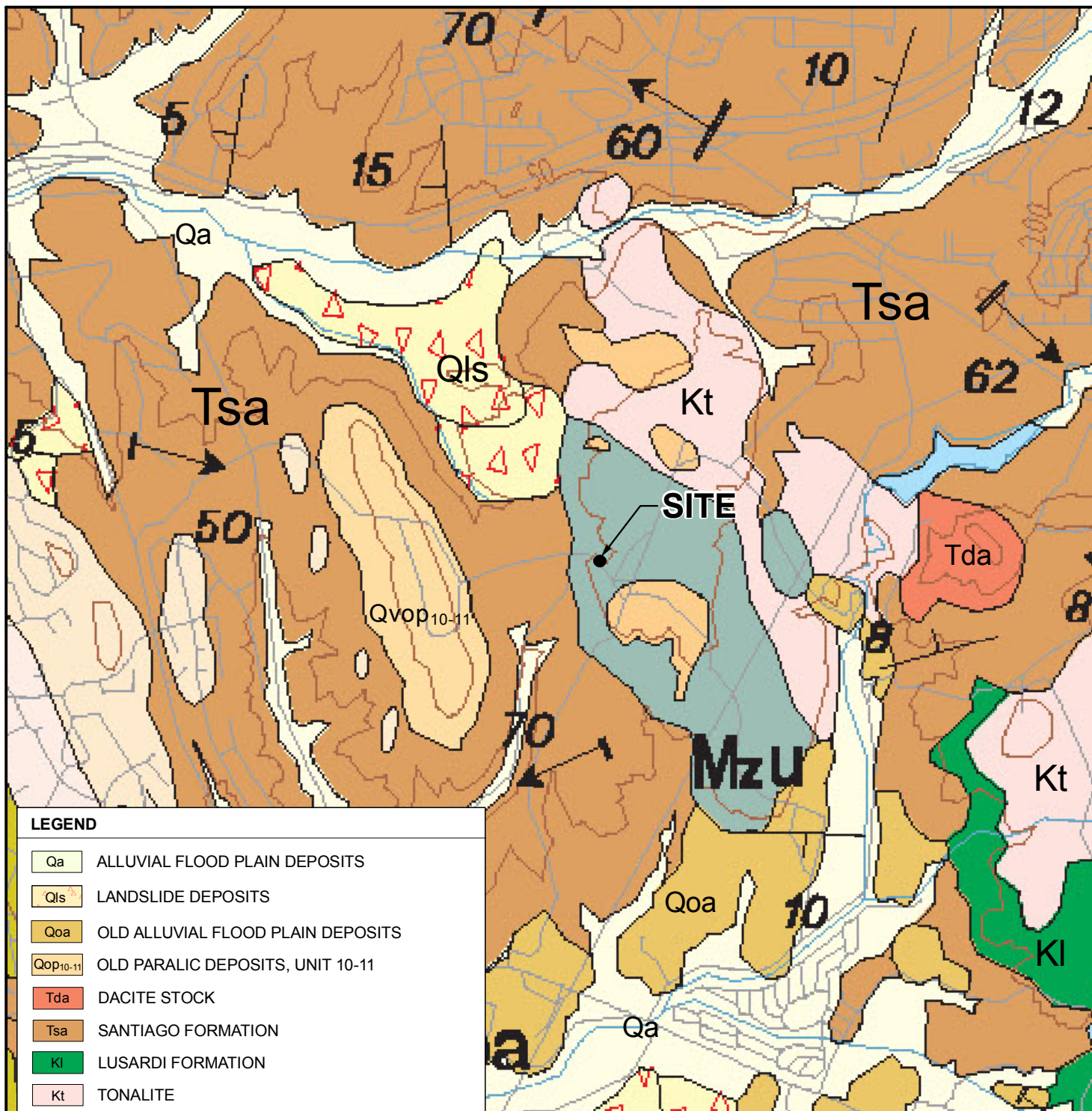
DATE

CALAVERA HILLS GATEWAY IMPROVEMENTS
2997 GLASGOW DRIVE
CARLSBAD, CALIFORNIA

107544007

2/15

3



NOTES: ALL DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE

Ninyo & Moore

GEOLOGY

FIGURE

PROJECT NO.

DATE

CALAVERA HILLS GATEWAY IMPROVEMENTS
2997 GLASGOW DRIVE
CARLSBAD, CALIFORNIA

107544007

2/15

4

APPENDIX A
TEST PIT LOGS

Field Procedure for the Collection of Disturbed Samples

Disturbed soil samples were obtained in the field using the following method.

Bulk Samples

Bulk samples of representative earth materials were obtained from the exploratory test pits. The samples were bagged and transported to the laboratory for testing.

Explanation of Test Pit, Core, Trench and Hand Auger Log Symbols

PROJECT NO.

DATE

DEPTH (FEET)

SAMPLES

MOISTURE (%)

DRY DENSITY (PCF)

CLASSIFICATION
U.S.C.S.

EXCAVATION LOG EXPLANATION SHEET

0

1

2

3

4

5

Bulk

Driven

Sand Cone

~

▽

▽

xx/xx

SM

ML

SM

FILL:

Bulk sample.

Dashed line denotes material change.

Drive sample.

Sand cone performed.

Seepage

Groundwater encountered during excavation.

No recovery with drive sampler.

Groundwater encountered after excavation.

Sample retained by others.

Shelby tube sample. Distance pushed in inches/length of sample recovered in inches

No recovery with Shelby tube sampler.

ALLUVIUM

Solid line denotes unit change.

Attitude: Strike/Dip

b: Bedding

c: Contact

j: Joint

f: Fracture

F: Fault

cs: Clay Seam

s: Shear

bss: Basal Slide Surface

sf: Shear Fracture

sz: Shear Zone

sbs: Sheared Bedding Surface

The total depth line is a solid line that is drawn at the bottom of the excavation log.

SCALE: 1 inch = 1 foot



TEST PIT LOG

CALAVERA HILLS GATEWAY IMPROVEMENTS
2997 GLASGOW DRIVE, CARLSBAD, CALIFORNIA

PROJECT NO.

107544007

DATE

2/15

DEPTH (FEET)

Bulk

Driven

Sand Cone

SAMPLES

MOISTURE (%)

DRY DENSITY (PCF)

CLASSIFICATION
U.S.C.S.

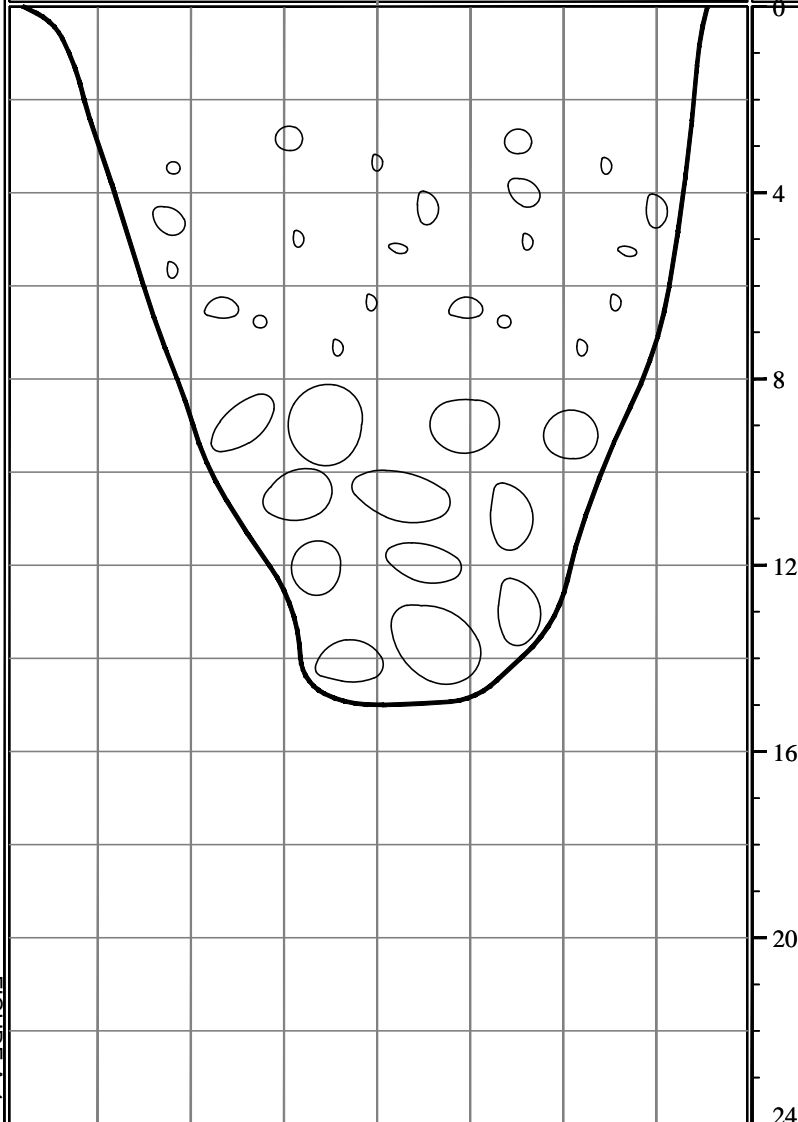
DATE EXCAVATED 1/16/15 TEST PIT NO. TP-1

GROUND ELEVATION 352' ± (MSL) LOGGED BY CKV

METHOD OF EXCAVATION 310 JD Backhoe

LOCATION See Figure 2

DESCRIPTION



18.7

16.1

CL

FILL:
Dark brown, moist, soft, fine sandy CLAY; with organics; trace gravel.
Gray, soft to firm, fine to medium sand; silty; scattered organics.

@ 3.0': Scattered gravel and cobble.

Brown, firm, fine to medium sand with gravel; scattered cobble and organics.

@ 9': Boulders up to 24 inches in diameter. Difficult excavation.

Scattered construction debris (wooden stake).

Total Depth = 15 feet.
Groundwater not encountered.
Backfilled on 1/16/15 shortly after excavation.

Note: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.

FIGURE A-1

SCALE = 1 in./4 ft.



TEST PIT LOG

CALAVERA HILLS GATEWAY IMPROVEMENTS
2997 GLASGOW DRIVE, CARLSBAD, CALIFORNIA

PROJECT NO.

DATE

107544007

2/15

DEPTH (FEET)

Bulk

Driven

Sand

Cone

SAMPLES

MOISTURE (%)

DRY DENSITY (PCF)

CLASSIFICATION
U.S.C.S.

DATE EXCAVATED 1/16/15 TEST PIT NO. TP-2

GROUND ELEVATION 351'± (MSL) LOGGED BY CKV

METHOD OF EXCAVATION 310 JD Backhoe

LOCATION See Figure 2

DESCRIPTION

0

10.3

CL

FILL:
Brown, moist, soft, fine to medium sandy CLAY; with organics; trace gravel.
Gray, soft to firm; scattered gravel and organics; scattered construction debris (wooden stake).

4

13.4

@ 5': Cobble up to 12 inches in diameter.

Brown, firm with gravel; scattered cobble and organics.

8

METAVOLCANIC ROCK:
Light reddish brown, dry to moist, intensely weathered METAVOLCANIC ROCK.

12

Total Depth = 9.5 feet. (Refusal)
Groundwater not encountered.
Backfilled on 1/16/15 shortly after excavation.

Note: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

16

The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.

20

24

SCALE = 1 in./4 ft.



TEST PIT LOG

CALAVERA HILLS GATEWAY IMPROVEMENTS
2997 GLASGOW DRIVE, CARLSBAD, CALIFORNIA

PROJECT NO.

107544007

DATE

2/15

DEPTH (FEET)

Bulk

Driven

Sand Cone

SAMPLES

MOISTURE (%)

DRY DENSITY (PCF)

CLASSIFICATION
U.S.C.S.

DATE EXCAVATED 1/16/15 TEST PIT NO. TP-3

GROUND ELEVATION 351'± (MSL) LOGGED BY CKV

METHOD OF EXCAVATION 310 JD Backhoe

LOCATION See Figure 2

DESCRIPTION

FILL:
Brown, moist, soft, fine to medium sandy CLAY; scattered gravel and organics.
Gray, firm, fine to medium sand; silty; scattered gravel, cobble, organics; and construction debris (concrete pieces, wooden stake).
@ 3': Brown; boulders up to 24 inches in diameter. Difficult excavation.

METAVOLCANIC ROCK:
Grayish brown, moist, intensely to moderately weathered, METAVOLCANIC ROCK.

@ 6.5': Very moist.

Total Depth = 7 feet. (Refusal)
Groundwater not encountered.
Backfilled on 1/16/15 shortly after excavation.

Note: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.

FIGURE A-3

SCALE = 1 in./4 ft.

APPENDIX B

LABORATORY TESTING

Classification

Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488. Soil classifications are indicated on the logs of the exploratory test pits in Appendix A.

Moisture Content

The moisture content of samples obtained from the exploratory excavations was evaluated in accordance with ASTM D 2216. The test results are presented on the logs of the exploratory excavations in Appendix A.

Gradation Analysis

Gradation analysis test were performed on a selected representative soil samples in general accordance with ASTM D 422. The grain-size distribution curves are shown on Figures B-1 through B-3. These test results were utilized in evaluating the soil classifications in accordance with the USCS.

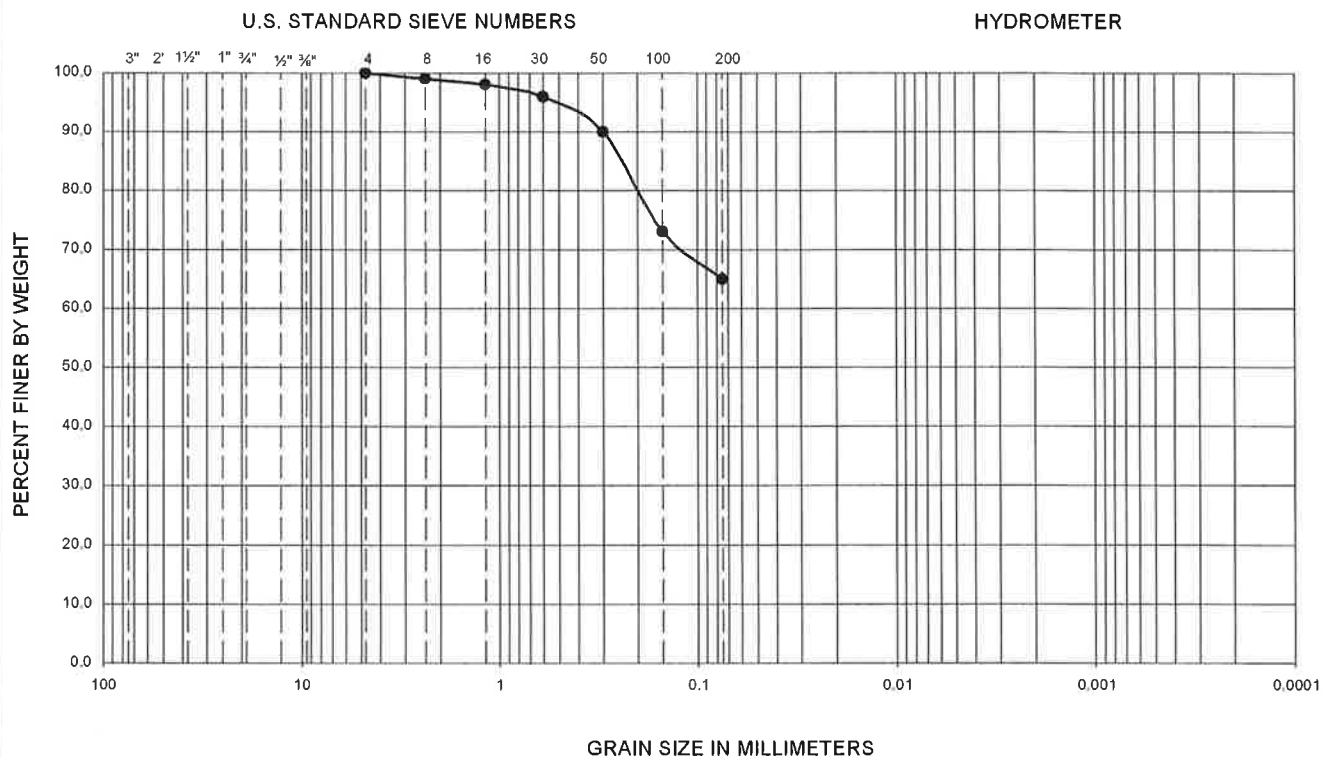
Expansion Index Test

The expansion index of selected material was evaluated in general accordance with ASTM D 4829. The specimen was molded under a specified compactive energy at approximately 50 percent saturation. The prepared 1-inch thick by 4-inch diameter specimen was loaded with a surcharge of 144 pounds per square foot and was inundated with tap water. Readings of volumetric swell were made for a period of 24 hours. The results of this test are presented on Figure B-4.

Soil Corrosivity Tests

Soil pH, and minimum resistivity tests were performed on representative samples in general accordance with CT 643. The sulfate and chloride content of the selected samples were evaluated in general accordance with CT 417 and CT 422, respectively. The test results are presented on Figure B-5.

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	USCS
●	TP-1	1.0-3.0	--	--	--	--	--	--	--	--	65	CL

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

Ningo & Moore

GRADATION TEST RESULTS

FIGURE

PROJECT NO.

DATE

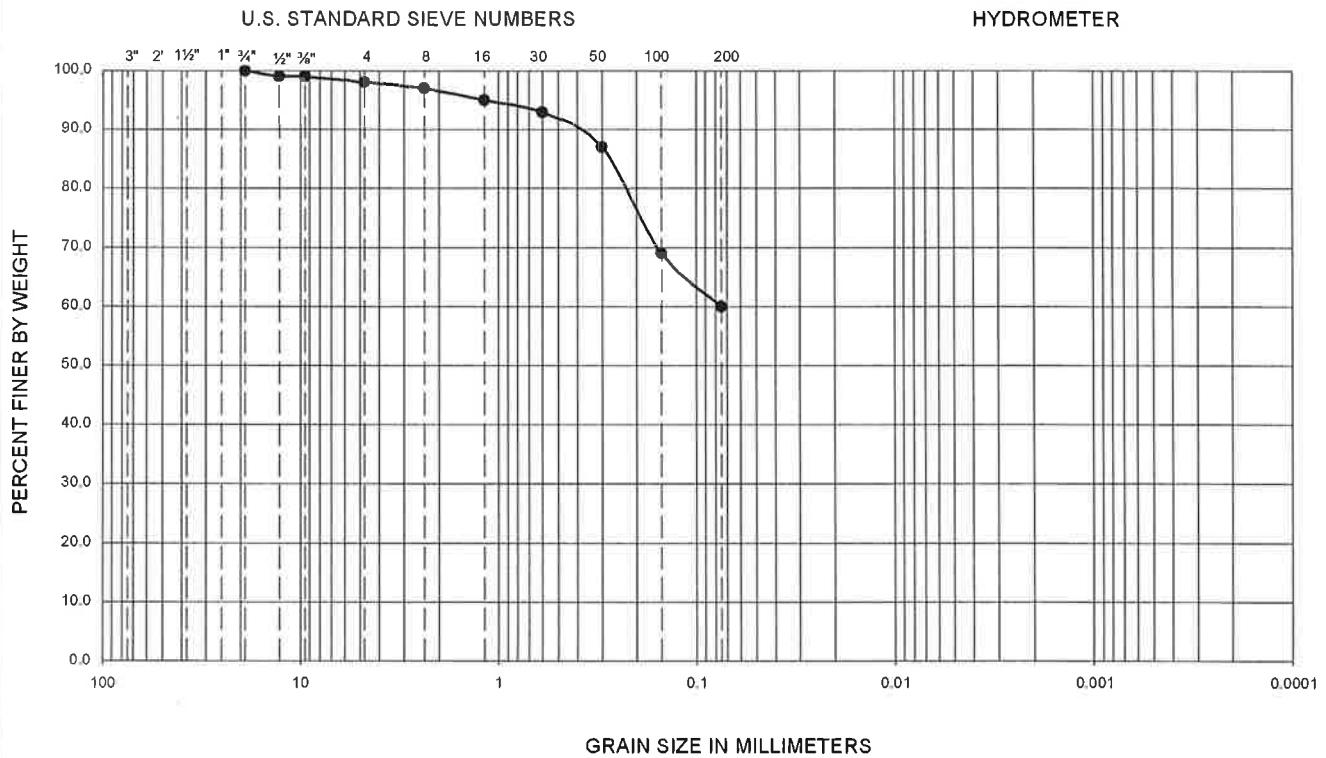
107544007

2/15

CALAVERA HILLS GATEWAY IMPROVEMENTS
2997 GLASGOW DRIVE
CARLSBAD, CALIFORNIA

B-1

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY

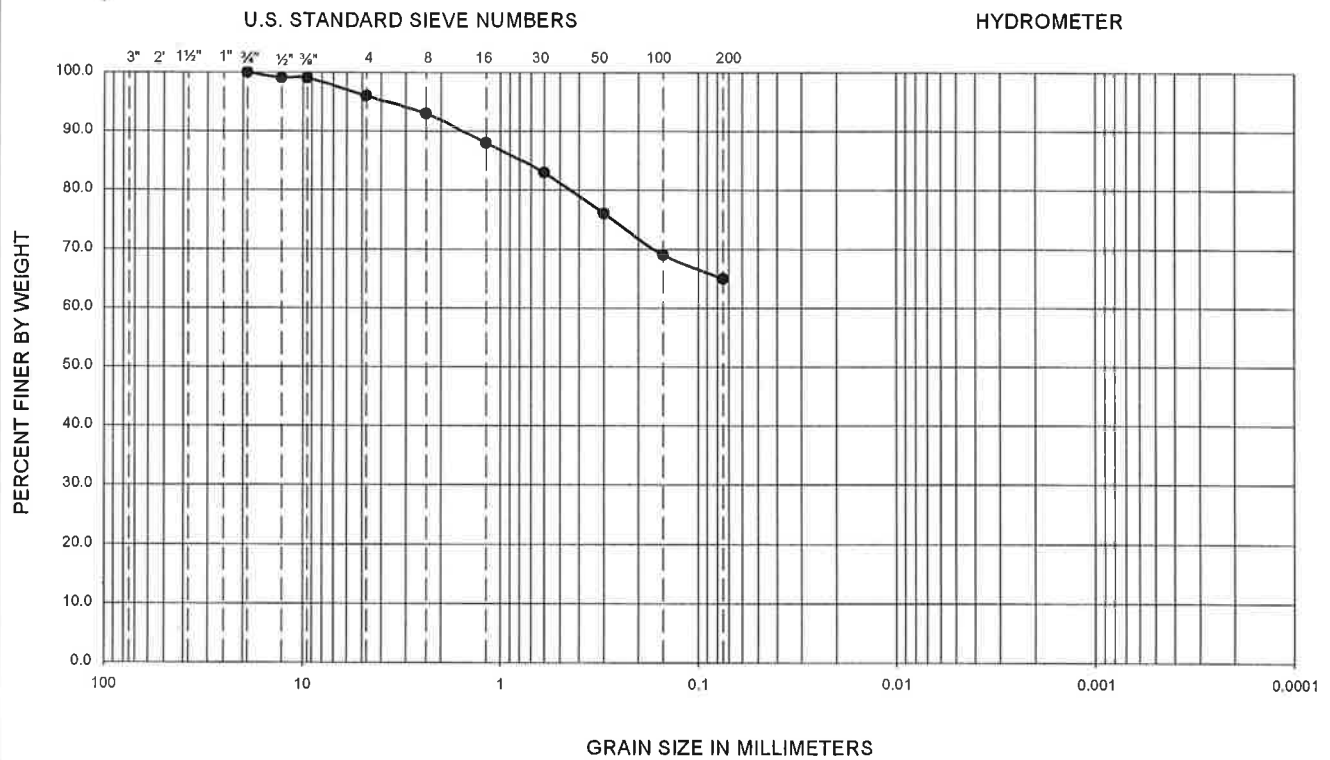


Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	USCS
●	TP-2	1.0-5.0	--	--	--	--	--	--	--	--	60	CL

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

Ninyo & Moore		GRADATION TEST RESULTS	FIGURE B-2
PROJECT NO.	DATE	CALAVERA HILLS GATEWAY IMPROVEMENTS 2997 GLASGOW DRIVE CARLSBAD, CALIFORNIA	
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GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	USCS
●	TP-3	0.0-1.5	--	--	--	--	--	--	--	--	65	CL

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

Ninyo & Moore		GRADATION TEST RESULTS	FIGURE B-3
PROJECT NO.	DATE	CALAVERA HILLS GATEWAY IMPROVEMENTS 2997 GLASGOW DRIVE CARLSBAD, CALIFORNIA	
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SAMPLE LOCATION	SAMPLE DEPTH (FT)	INITIAL MOISTURE (%)	COMPACTED DRY DENSITY (PCF)	FINAL MOISTURE (%)	VOLUMETRIC SWELL (IN)	EXPANSION INDEX	POTENTIAL EXPANSION
TP-2	1.0-5.0	10.0	107.8	18.7	0.008	7	Very Low

PERFORMED IN GENERAL ACCORDANCE WITH ☐ UBC STANDARD 18-2 ☒ ASTM D 4829

Ninyo & Moore		EXPANSION INDEX TEST RESULTS	FIGURE B-4
PROJECT NO.	DATE	CALAVERA HILLS GATEWAY IMPROVEMENTS 2997 GLASGOW DRIVE CARLSBAD, CALIFORNIA	
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SAMPLE LOCATION	SAMPLE DEPTH (FT)	pH ¹	RESISTIVITY ¹ (Ohm-cm)	SULFATE CONTENT ²		CHLORIDE CONTENT ³ (ppm)
				(ppm)	(%)	
TP-1	1.0-5.0	7.2	700	300	0.030	780

¹ PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 643

² PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 417

³ PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 422

Ninyo & Moore		CORROSIVITY TEST RESULTS	FIGURE B-5
PROJECT NO.	DATE	CALAVERA HILLS GATEWAY IMPROVEMENTS 2997 GLASGOW DRIVE CARLSBAD, CALIFORNIA	
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