



City of
Los Banos
At the Crossroads of California

Contract Documents
for
Construction of

OLIVEIRA PARK RENOVATIONS

June 2017

Bid Proposals must be received no later than 2:00 p.m. July 13, 2017
City of Los Banos City Clerk
520 J Street
Los Banos, CA 93635

City of Los Banos
Public Works Department

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Advertisement for Bids

CITY OF LOS BANOS
520 J Street
Los Banos, California 93635

Notice is hereby given that separate sealed bids for the award of contract for the **Construction of Oliveira Park Renovations** will be received by the City of Los Banos at the office of the City Clerk until 2:00 p.m. Pacific Daylight Savings Time, July 13, 2017 and then at said office publicly opened and read aloud.

The major work consists of a renovation process to re-establish grading patterns to ensure positive drainage across fields, re-plant lawn playfield areas, install new concrete sidewalks from the parking lot to new entry gates and the installation of concrete mow curbs, and chain link fencing around the soccer play fields. Improvements will also include a new driveway apron on Limestone Boulevard.

The time for completion shall be 150 days. (60 calendar days demolition/construction and 90 calendar days establishment/maintenance)

The Contract Documents, in their entirety, can be viewed and/or obtained from the City of Los Banos website at www.losbanos.org or at the following locations:

Central California Builders Exchange, 1244 N. Mariposa, Fresno, CA 93703 (www.cencalbx.com)

Builders Exchange of Stockton, 7500 N. West Lane, Stockton, CA 95210 (www.besonline.com)

Valley Builders Exchange, Inc., 1118 Kansas Avenue, Modesto, CA 95351 (www.valleybx.com)

Dodge Data & Analytics 1-800-393-6343 (www.construction.com/plans/)

A payment bond prepared and executed in accordance with California Civil Code Section 3247 and a bond for faithful performance of the contract will be required of the successful bidder who is awarded the contract.

The successful bidder must comply with the latest general prevailing rate of per diem wages as determined by the Director of Industrial Relations, State of California, Department of Industrial Relations and is to be paid to the various craftsmen and laborers required to construct said improvements and is made a part of the specifications and contract for said work to which reference is hereby made for further particulars.

No contractor or subcontractor may be listed on a bid proposal or awarded a contract for public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. Contractor registration information can be found at:

<http://www.dir.ca.gov/Public-Works/PublicWorks.html>

Each bid shall be accompanied by cashier's or certified check or by a bidder's bond, made payable to the City of Los Banos and executed by a corporate surety licensed to issue surety bonds in the State of California, for an amount equal to at least ten percent (10%) of the amount of said bid and no bid shall be considered unless such cashier's or certified check or bidder's bond is enclosed therewith.

The successful bidder of this project shall have the following current and active California State Contractor's License at the time of the submission of the bid and throughout the duration of the contract: **C27 – Landscape** or **Class A – General Contractor**.

Prospective bidders are encouraged to attend a pre-bid meeting on June 27, 2017 at 10:00 am.

Bidders shall refer to the Contract Document's Information for Bidders for complete instructions.

Bidders are solely responsible for the cost of preparing their bids.

The City specifically reserves the right, in its sole discretion, to reject any or all bids, to re-bid, or to waive inconsequential defects, in bidding not involving time, or quality of the work. The City may reject any and all bids and waive any minor irregularities in the bids.

Information for Bidders

Sealed bids will be received by the City of Los Banos (herein called the "Owner"), at the office of the City Clerk until 2:00 p.m. Pacific Daylight Savings Time (PDST) on July 13, 2017, then at said office, publicly opened and read aloud. Owner shall reject all bids received after the specified time and will return such bids to bidder, unopened. Bidders must submit bids in accordance with these instructions. No emailed or faxed bids will be accepted.

The major work consists of a renovation process to re-establish grading patterns to ensure positive drainage across fields, re-plant lawn playfield areas, install new concrete sidewalks from the parking lot to new entry gates and the installation of concrete mow curbs, and chain link fencing around the soccer play fields. Improvements will also include a new driveway apron on Limestone Boulevard.

The time for completion shall be 60 calendar days demolition/construction and 90 calendar days establishment/maintenance (150 calendar days total).

Each bid must be submitted in a sealed envelope and addressed to the City of Los Banos at 520 J Street, Los Banos, CA 93635. Each sealed envelope containing a bid must be plainly marked on the outside as "**OLIVEIRA PARK RENOVATIONS: Attention City Clerk**", and the envelope shall also bear on the outside, the name of the bidder, and their address. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed to the City of Los Banos at 520 J Street, Los Banos, CA, 93635, and also clearly state, "**OLIVEIRA PARK RENOVATIONS: Attention City Clerk**".

A complete bid includes the Bid Form, List of Subcontractors, Equal Employment Opportunity, Non-Collusion Affidavit, Debarment and Suspension Certification, Bid Schedule, Experience, Bid Bond with surety, and a copy of a current California State Contractor's License. A signed Addendum, if issued, must also be submitted with the sealed bid. The Total Bid Amount must be filled in, in ink or typewritten, and the bid must be fully completed and executed when submitted. Only one set of original bid forms are required to be submitted. Mistakes must be corrected and the correction inserted; correction must be initialed in ink by person or persons signing the bid. No conditional bids will be accepted.

The bid shall be signed by a person or persons legally authorized to bind bidder to the contract. The individual or individuals signing each document shall warrant that they are authorized to bind the bidder.

The Owner may waive any informalities or minor defects or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within 30 days after the actual date of the opening thereof. Should there be reasons why the contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the bidder.

Each bid must be accompanied by a bid bond payable to the Owner for ten percent (10%) of the total amount of the bid. As soon as the bid amounts have been compared, the Owner will return the bid security of all except the three lowest responsive and responsible bidders. Once a bid has been awarded, and the payment bond and performance bond of the successful bidder has been received by the Owner, the bid security of the three remaining lowest responsive and responsible bidders will be returned.

All bonds must be acknowledged before a Notary Public by both the bidder and the surety. Attorneys-in-fact who sign bid bonds or payment bonds and performance bonds must file with each bond a certified and effective dated copy of their power of attorney.

Award and Execution of Contract

The party to whom the contract is awarded will be required to execute the Agreement, and obtain the performance bond and payment bond along with satisfactory evidence of insurance within ten (10)

calendar days from the date when the Notice of Award is delivered to the successful bidder. The Notice of Award shall be accompanied by the necessary agreement and bond forms. In case of failure of the bidder to execute the Agreement, the Owner may, at his option, consider the bidder in default, in which case the bid bond accompanying the bid shall become the property of the Owner.

A performance bond and a payment bond, each in the amount of 100 percent of the Contract Price, with a corporate surety named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570, will be required for the faithful performance of the contract. The payment bond must be issued by an admitted surety insurer holding a certificate of authority to transact surety insurance in California issued by the Insurance Commissioner.

All bonds must be acknowledged before a Notary Public by both the bidder and the surety. Attorneys-in-fact who sign bid bonds or payment bonds and performance bonds must file with each bond a certified and effective dated copy of their power of attorney.

The Owner, within 15 days of receipt of the performance bond, payment bond and agreement signed by the party to whom the contract was awarded, shall sign the Agreement and return to such party an executed duplicate of the agreement. Should the Owner not execute the Agreement within such period, the bidder may, by written notice, withdraw his signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the Owner.

The Notice to Proceed shall be issued within 10 days of the execution of the Agreement by the Owner. Should there be reasons why the Notice to Proceed has not been issued within such period, the time may be extended by mutually agreed upon, and the bidder may terminate the Agreement without further liability on the part of either party.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the Contract throughout.

Subcontractors

The subcontractors listed by bidder in the bid shall list therein the name and address of each subcontractor to whom the bidder proposes to subcontract portions of the work in an amount in excess of one-half of one percent of the total bid or \$10,000, whichever is greater, in accordance with the Subletting and Subcontracting Fair Practices Act, commencing with Section 4100 of the Public Contract Code. The bidder's attention is invited to other provisions of the Act related to the imposition of penalties for a failure to observe its provisions by using unauthorized subcontractors or by making unauthorized substitutions.

Registration with California Department of Industrial Relations (DIR)

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, as defined in this chapter, unless currently registered and qualified to perform public work pursuant to Section 1725.5. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time the contract is awarded. Labor Code Section 1771.1(a) requires contractors and their subcontractors to possess and maintain such registration with DIR in order to be awarded and to perform on public works projects (regardless of funding source).

Pursuant to Section 1771.4, each contractor and subcontractor shall furnish certified payroll records to the Labor Commissioner at least monthly and in a format prescribed by the Labor Commissioner of the DIR. Until such time that the DIR gives awarding agencies direct access to all certified payrolls submitted by contractors and subcontractors, contractor and his subcontractors are also required to submit copies of payroll records to Owner on a monthly basis. Information on the above can be found at:

<http://www.dir.ca.gov/Public-Works/PublicWorks.html>

Prevailing Wage

This work is subject to prevailing wage requirements. If there is a difference between the minimum wage rates predetermined by the Secretary of Labor and the prevailing wage rates determined by the Director of the Department of Industrial Relations of the State of California for similar classification of labor, the contractor and his subcontractor shall not pay less than the higher wage rate. In accordance with the provisions of Section 1773 of the Labor Code of the State of California, the Owner has obtained from the Director of the Department of Industrial Relations, the general prevailing rate for each craft, classification, or type of workman required for execution of the Agreement. A copy of said prevailing rate of per diem wages is on file in the office of the Owner, and available from the California Department of Industrial Relations' Internet web site at <http://www.dir.ca.gov/DLSR/PWD>.

The Federal minimum wage rates for this work as predetermined by the United States Secretary of Labor may be examined at the offices described above where the Contract Documents may be seen. Addenda to modify the Federal minimum wage rates, if necessary, will be posted on the internet at www.losbanos.org. Future effective general prevailing wage rates, which have been predetermined are on file with the California Department of Industrial Relations and are referenced but not printed in the general prevailing wage rates.

Pre-Bid Meeting

Prospective bidders are encouraged to attend a pre-bid meeting on June 27, 2017 at 10:00 am. The address for the meeting is the City of Los Banos Public Works Department, 411 Madison Avenue in Los Banos, California.

Bidders must satisfy themselves as to the accuracy of the estimated quantities in the Bid Schedule by examination of the site and a review of the drawings and specifications including addenda. After bids have been submitted, the bidder shall not assert that there was misunderstanding concerning the quantities of work or the nature of the work to be done. The failure or omission of any bidder to do any of the foregoing shall not relieve any bidder from any obligation with respect to his bid.

The Contract Documents contain the provisions required for the construction of the project. The Owner will not be responsible for, nor be bound by, any oral instructions, interpretations, or explanations issued by the Owner or its representatives. Any request for clarifications or questions of the Contract Documents shall be made in writing or email and deliverable to:

City of Los Banos Public Works Department
Attn: Greg Pimentel
greg.pimentel@losbanos.org
411 Madison Avenue
Los Banos, CA 93635

Requests for clarification or questions shall be delivered to the Owner before 5:00 p.m. PDST on July 5, 2017. Any Owner response to a request for clarification, questions and answers will be posted to the City's website at www.losbanos.org no later than 5:00 p.m. PDST on July 7, 2017 and if necessary, shall become a part of the bid as an addendum.

Proposed timeline of events associated with the awarding of bid:

Release of Advertisement for Bid		June 16, 2017
Pre-Bid Meeting	10:00 a.m.	June 27, 2017
Deadline to Submit Questions/Clarifications	5:00 p.m.	July 5, 2017
Addendum/Questions/Clarifications posted	5:00 p.m.	July 7, 2017
Bid Opening	2:00 p.m.	July 13, 2017
City Council Considers Bid		August 2, 2017 (tentative)
Issuance of a Notice to Proceed	On or before:	August 17, 2017 (tentative)
Construction to Begin	On or before:	August 28, 2017 (tentative)

Qualification of Bidder

The Owner may make such investigation as it deems necessary to determine the ability of the bidder to provide the services requested, and the bidder shall furnish to the Owner all information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid should the evidence submitted by, or investigation of, the bidder fail to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the bid and to complete the requirements contemplated therein.

Governing Law and Venue

This bid, or any contract that may result from the award of this bid, shall be deemed to be made under, and shall be governed by and construed in accordance with, the laws of the State of California. Any action brought to enforce the terms, or provision of this bid or any contract that may result from the award of this bid, shall have venue in the County of Merced, State of California.

Mandatory Bid Protest Procedure

The lack of prompt procedure to resolve disputes regarding the bidding process would impair the Owner's ability to carry out its purpose of contracting this project in a timely manner. Therefore, to the maximum extent authorized by law and notwithstanding any other procedures specified in these Contract Documents, all disputes and/or protests regarding the bidding process shall be subject to the following procedure. In submitting a bid to the Owner for this work, the bidder agrees to comply with and to be bound by this procedure.

Any bid protest must be submitted in writing to the Owner before 5:00 p.m. on the fifth (5th) business day following bid opening.

1. The initial protest document must contain a complete statement of the basis for the protest, and all supporting documentation. A non-refundable fee of One Thousand Dollars (\$1,000.00) made payable to the "City of Los Banos" shall accompany the protest documents and will be used by the Owner to recover costs in evaluating the bid protest. A bid protest submitted without the requisite fee shall not be considered by the Owner.
2. The party filing the protest must have actually submitted a bid for the work. A subcontractor of a party submitting a bid for the work may not submit a bid protest. Only bidders who the Owner otherwise determines are responsive and responsible are eligible to protest a bid.
3. A party may not rely on the bid protest submitted by another bidder, but must timely pursue its own protest.
4. The protest must refer to the specific portion of the Contract Documents which forms the basis for the protest.
5. The protest must include the name, address and telephone number of the person representing the protesting party.
6. The party filing the protest must concurrently transmit a copy of the initial protest document and any attached documentation to all other parties with a direct financial interest which may be adversely affected by the outcome of the protest. Such parties shall include all other bidders who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.
7. The Owner will give the protested bidder five (5) business days after the receipt of the protest to submit a written response. The responding bidder shall transmit the response to the protesting bidder concurrent with the delivery to the Owner.
8. The procedure and time limits set forth in this paragraph are mandatory and are the bidder's sole and exclusive remedy in the event of bid protest. The bidder's failure to comply with these procedures shall constitute a waiver of any right to further pursue the bid protest, including filing a Government Code Claim or legal proceedings.

If the Owner determines that a protest is frivolous, the protesting bidder may be determined to be non-responsive and/or non-responsible and that bidder may be determined to be ineligible for future contract awards.

Cancellation of Contract

The Owner may terminate any contract derived from this bid as follows:

- WITHOUT CAUSE at any time by giving thirty (30) calendar days written notice to the successful bidder;
- WITH CAUSE (Default) at any time by giving ten (10) calendar days written notice to the successful bidder. Cancellation for cause shall be at the discretion of the Owner and shall be, but is not limited to, failure to supply the items, materials, equipment or services specified within the time allowed or within the terms, conditions or provisions of this bid. The successful bidder may not cancel any contract derived from this bid, without prior written consent of the Owner.

Bid Form

TO: City of Los Banos
520 J Street
Los Banos, CA 93635

In compliance with the Advertisement for Bids the undersigned, as bidder, hereby offers to provide to the Owner, in accordance with the terms and conditions in the provisions set forth in the Contract Documents the stated total bid amount quoted on this Bid Form for the work of

OLIVEIRA PARK RENOVATIONS

Total Bid Amount: \$ _____

(Total Bid Amount in Written Form)

The undersigned certifies under penalty of perjury under the laws of the State of California and the United States of America, that the above quotation constitutes a bona-fide offer for the work, that undersigned is a duly authorized representative of the company listed, that the quotation is in no way sham or collusive, and that the executed Agreement between the bidder and Owner constitutes acceptance of bidder's total bid for the work stated in the Contract Documents. The undersigned has read the General Provisions, Special Provisions, and Technical Specifications in these Contract Documents. The undersigned further certifies, under penalty of perjury that the Non-Collusion Affidavit required by Title 23 United States Code, Section 112 and Public Contract Code Section 7106; and the Title 49 Code of Federal Regulations, Part 29 Debarment and Suspension Certification are true and correct.

The undersigned acknowledges receipt of the following addenda: _____

Signature: _____ Date: _____

Title: _____

Name of Business: _____

Doing business as: (*Circle One*): An Individual A Partnership A Corporation

Business Address: _____

Telephone No.: _____ Fax No.: _____

E-Mail Address: _____

License Number: _____ Class & Expiration Date: _____

Non-Collusion Affidavit
PUBLIC CONTRACT CODE 7106

In conformance with Title 23 United States Code Section 112 and Public Contract Code 7106 the bidder declares that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that 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, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that 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, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

Debarment and Suspension Certification

TITLE 49, CODE OF FEDERAL REGULATIONS, PART 29

The bidder, under penalty of perjury, certifies that, except as noted below, he/she or any other person associated therewith in the capacity of owner, partner, director, officer, and manager:

- Is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any federal agency;
- Has not been suspended, debarred, voluntarily excluded or determined ineligible by any federal agency within the past 3 years;
- Does not have a proposed debarment pending; and
- Has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If there are any exceptions to this certification, insert the exceptions to an additional sheet of paper and include with the bid.

Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted above, indicate on an additional sheet of paper to whom it applies, initiating agency, and dates of action.

NPDES/MS4 Compliance Certification

All construction projects within the City limits must comply with the National Pollutant Discharge Elimination System (NPDES) storm water regulation adopted by the EPA and the Phase II Small Municipal Separate Storm Sewer System (MS4) General Permit requirements, regardless of size.

The City is required under these permits to provide information to Contractors performing work within City limits about training opportunities to assist in managing potential pollutants from construction –related activities, selection, installation, implementation, and maintenance of Best Management Practices (BMPs), as well as overall program compliance. The City has provided such information and helpful links on their website at <http://www.losbanos.org/city-government/departments/public-works/>, under the Storm Water Management Plan tab.

The Bidder acknowledges that they are aware of the necessity to be in compliance with the NPDES and MS4 permits while working within City limits, and that information regarding such is available on the City's website.

Note: The above certifications are part of the bid. Signing this bid on the signature portion thereof shall also constitute signature of these certifications.

**Bid Schedule
For
OLIVEIRA PARK RENOVATIONS**

Bidder agrees to perform all the work described in the Contract Documents for the following unit and lump sum prices and understands that the quantity of work shown is approximate only. The schedule shall be completed by the bidder with the unit and lump sum prices entered in numerals. The extensions shall be made by the bidder. In case of discrepancy between the unit prices and the extension thereof, the unit price shall be considered as correct when evaluating bids.

ITEM NO.	ITEM	QUANTITY AND UNIT	UNIT PRICE	AMOUNT
1	General Conditions (Max 2.5%)	1 LS	\$	\$
2	Mobilization/Demolition (Max 4%)	1 LS	\$	\$
3	Site Preparation	1 LS	\$	\$
4	Demolition and Sawcutting Curb/Gutter	1 LS	\$	\$
5	Site Grading	1 LS	\$	\$
6	Concrete Driveway Apron	1 EA	\$	\$
7	Concrete Pavement with Base Rock	734 SF	\$	\$
8	9" Concrete Mow Curb at Fence	1,719 LF	\$	\$
9	15" Concrete Mow Curb at 20' Slide Gate	40 LF	\$	\$
10	Chainlink Fence	1,719 LF	\$	\$
11	Chainlink 12' Slide Gate	2 EA	\$	\$
12	Chainlink 20' Slide Gate	2 EA	\$	\$
13	Irrigation System Adjustments	1 LS	\$	\$
14	Soil Amendments/Preparation	195,910 SF	\$	\$
15	Drill Seeding Lawn	195,910 SF	\$	\$
16	Landscape Maintenance	1 LS	\$	\$
Base Bid Total:			\$	_____

Bid Schedule continued on next page.

BID ALTERNATE #1 ITEM LIST

ITEM NO.	ITEM	QUANTITY AND UNIT	UNIT PRICE	AMOUNT
1	9" Concrete Mow Curb at Fence	328 LF	\$	\$
2	15" Concrete Mow Curb at 20' Slide Gate	40 LF	\$	\$
3	Chainlink Fence	328 LF	\$	\$
4	Chainlink 20' Slide Gate	2 EA	\$	\$
Bid Alternate #1 Total:			\$	

BID ALTERNATE #2 ITEM LIST

ITEM NO.	ITEM	QUANTITY AND UNIT	UNIT PRICE	AMOUNT
1	Black Vinyl Coating on all Chain Link Fabric Mesh (Fence & Gates), Black coating on all Posts, Rails & Fence Components	1 LS	\$	\$
Bid Alternate #2 Total:			\$	

Note: The representations made herein are made under penalty of perjury. Any information contained in the bid which is proven false shall be considered nonresponsive and this bid shall be rejected.

Bid Bond

We, _____

as Contractor, and _____

as Surety, jointly and severally, bind ourselves, our heirs, representatives, successors and assigns, as set forth herein, to the **City of Los Banos** (herein called "Owner") for payment

of the penal sum of _____

_____ Dollars (\$_____),

lawful money of the United States. Contractor has submitted the accompanying bid proposal

for the construction of: **OLIVEIRA PARK RENOVATIONS**

If the Contractor is awarded the contract and enters into a written agreement, in the form prescribed by the Owner, at the price designated by Bid Schedule, and files a payment bond and performance bond with the Owner, or substitute security in lieu thereof, in the time and manner specified by the Owner, and carries all insurance in type and amount which conforms to the General Provisions, Special Provisions, and Technical Specifications in these Contract Documents and furnishes required certificates and endorsements thereof, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

Forfeiture of this bond, or any deposit made in lieu thereof, shall not preclude the Owner from seeking all other remedies provided by law to cover losses sustained as a result of the Contractor's failure to do any of the foregoing.

Contractor and Surety agree that if the Owner is required to engage the services of an attorney in connection with the enforcement of this bond, each shall pay Owner's reasonable attorney's fees incurred with or without suit.

Executed on _____, 20

Contractor

(Seal if Corporation)

By: _____

Title _____

[SIGNATURE SHEET CONTINUES ONTO NEXT PAGE]

Any claims under this bond may be addressed to:

_____ (name and address of Surety)

_____ (name and address of Surety's agent for service of process in California, if different from above)

_____ (phone number of Surety's agent in California)

(Attach Acknowledgment)

Surety

By _____

(Attorney-in-Fact)

Notice: No substitution or revision to this bond form will be accepted. Sureties must be authorized to do business in and have an agent for service of process in California.

All bond forms must be acknowledged before a Notary Public by both the Contractor and the Surety. Attorneys-in-fact who sign bond forms must file with each bond a certified and effective dated copy of their power of attorney.

Agreement

SAMPLE

Note: Particulars left blank in this sample will be filled with project specific information as outlined in these bid documents.

THIS Agreement is dated as of the _____ day of _____ in the year 20__ by and between the **City of Los Banos, a California municipal corporation** ("Owner") and [ENTER NAME AND TYPE OF ENTITY] ("Contractor").

Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

1. WORK. Contractor shall complete the work indicated in Owner's Contract Documents entitled "Construction of Oliveira Park Renovations."

The work is generally described as follows:

- The major work consists of a renovation process to re-establish grading patterns to ensure positive drainage across fields, re-plant lawn playfield areas, install new concrete sidewalks from the parking lot to new entry gates and the installation of concrete mow curbs, and chain link fencing around the soccer play fields. Improvements will also include a new driveway apron on Limestone Boulevard.
- Contractor shall furnish all of the material, supplies, tools, equipment, labor and other services necessary for the construction and completion of the work described herein.

2. CONTRACT TIME. Contractor shall commence the work required by the Contract Documents within 10 calendar days after the date of the Notice to Proceed and will complete the same within the time period set forth in the bid, unless the period for completion is extended otherwise by the Contract Documents.

3. LIQUIDATED DAMAGES. Owner and Contractor recognize that time is of the essence of this Agreement and that Owner will suffer financial loss if the work is not completed within the time specified in Paragraph 2 herein, plus any extensions thereof allowed in accordance with Paragraph 21, Time for Completion and Liquidated Damages, of the General Provisions. The parties also recognize the delays, expense and difficulties involved in proving in a legal proceeding the actual loss suffered by Owner if the work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty) Contractor shall pay Owner Eight Hundred Dollars (\$ 800.00) for each day that passes after the time specified in Paragraph 2 herein.

4. CONTRACT PRICE. Owner shall pay Contractor for completion of the work in accordance with the Contract Documents in current funds the amount set forth in the Bid Schedule(s). The Contractor agrees to perform all of the work described in the Contract Documents for the unit and lump sum prices set forth in the Bid Schedule(s).

5. PAYMENT PROCEDURES. Contractor shall submit applications for payment in accordance with Paragraph 24, Progress Estimates, of the General Provisions. Applications for payment will be processed by Owner as provided in the General Provisions.

6. CONTRACT DOCUMENTS. The Contract Documents which comprise the entire agreement between Owner and Contractor concerning the work consists of this Agreement and the following attachments to this Agreement:

- (A) Advertisement for Bids
 - (B) Information for Bidders
 - (C) Bid
 - (D) Bid Bond
 - (E) Agreement
 - (F) Payment Bond
 - (G) Performance Bond
 - (H) Notice of Award
 - (I) Notice to Proceed
 - (J) Change Order
 - (K) General Provisions
 - (L) Special Provisions
 - (M) Technical Specifications prepared by O'Dell Engineering entitled "Construction of Oliveira Park Renovations", dated June 9, 2017.
 - (N) Drawings prepared by O'Dell Engineering numbered L0.0 through L2.1.
 - (O) Addenda
- No. _____, dated _____ 20__

There are no Contract Documents other than those listed in this Paragraph 6. The Contract Documents may only be amended by change order as provided in Paragraph 19, Changes in the Work, of the General Provisions.

7. MISCELLANEOUS.

A. Terms used in this Agreement which are defined in Paragraph 1 of the General Provisions will have the meanings indicated in the General Provisions.

B. No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation monies that may become due and monies that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

C. Owner and Contractor each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.

D. The Laws of the State of California shall govern this Agreement. Venue is Merced County. The provisions of this paragraph shall survive expiration or other termination of this Agreement regardless of the cause of such termination.

E. All bids become property of the Owner. All bids, including the accepted bid and any subsequent contract become public records per the requirements of the California Government Code, Sections 6250-6270, "California Public Records Act". Proprietary material must be clearly marked as such. Pricing and service elements of the successful bid are not consider proprietary information. The Owner will treat all information submitted

in a bid as available for public inspection once the Owner has selected a contractor. If you believe that you have a legally justifiable basis under the California Public Records Act (Government Section 6250 et. seq.) for protecting the confidentiality of any information contained within your bid, you must identify any such information, together with the legal basis of your claim in your bid. In order for the Owner to assess confidentiality of any such information on your behalf, you must request, execute and submit an Owner-prepared written agreement to defend and indemnify the Owner for any liability, costs, and expenses incurred in asserting such confidentiality as part of your bid. The final determination as to whether the Owner will assert your claim of confidentiality on your behalf shall be sole discretion of the Owner.

F. This Agreement shall not be interpreted in favor of any Party by virtue of said Party not having prepared this Agreement.

G. If any time period provided for in this Agreement ends on the day other than a Business Day, the time period shall be extended to the next Business Day.

IN WITNESS WHEREOF, Owner and Contractor have caused this Agreement to be executed the day and year first above written.

Date

By: _____
Authorized Representative of Owner

Title: _____

ATTEST:

Lucille L. Mallonee
City Clerk

APPROVED AS TO FORM:

William A. Vaughn
City Attorney

Date

By: _____
Authorized Representative of Contractor

Title: _____

(Seal if Corporation)

(Attach Acknowledgement for Authorized Representative of Contractor)

Certificate of Contractor

I, _____
(Name)

certify that I am a/the _____
(Title)

designate sole proprietor, partner in partnership, or corporate officer with Contractor License
Number _____ in the entity named as Contractor in the foregoing Agreement. I
hereby expressly certify that the name of the entity to which I am associated is

(Company Name)

that this entity is in good standing and has complied with all applicable laws and regulations, and
that I have been expressly authorized by the proper parties in this entity to execute the Agreement
on behalf of the above-named entity.

ATTEST:

Signature: _____

This form must be acknowledged before a Notary Public. The acknowledgement must be attached.

Payment Bond

We, _____

as Contractor, and _____

as Surety, jointly and severally, bind ourselves, our heirs, representatives, successors and

assigns, as set forth herein, to the **City of Los Banos** (herein called "Owner") for payment

of the penal sum of _____

_____ Dollars (\$ _____),

lawful money of the United States. Owner has awarded the contract and entered into an

Agreement with the Contractor for the construction of:

OLIVEIRA PARK RENOVATIONS

If Contractor or any of his subcontractors fails to pay any of the persons named in Section 3181 of the California Civil Code, or amounts due under the Unemployment Insurance Code with respect to work or labor performed under the contract or during the one-year guarantee period, or for any amounts required to be deducted, withheld, and paid over to the Franchise Tax Board from the wages of employees of the Contractor and his subcontractors pursuant to Section 13020 of the Unemployment Insurance Code, with respect to such work and labor, then Surety will pay the same in an amount not exceeding the sum specified above, and also will pay, in case suit is brought upon this bond, such reasonable attorney's fees as shall be fixed by the court.

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

Surety agrees that no change, extension of time, alteration, or addition to the terms of the Contract, or the work to be performed, or the Provisions shall in any way affect its obligation on this bond, and it does hereby waive notice thereof.

Contractor and Surety agree that should Owner become a party to any action on this bond that each will also pay Owner's reasonable attorney's fees incurred therein in addition to the above sum.

[SIGNATURE SHEET BEGINS ON NEXT PAGE]

Executed in four original counterparts on: _____, 20____

Contractor

(Seal if Corporation)

By: _____

Title: _____

(Attach Acknowledgment of Authorized Representative of Contractor)

Any claims under this bond may be addressed to:

_____ (name and address of Surety)

_____ (name and address of Surety's agent for service of process in California, if different from above)

_____ (phone number of Surety's agent in California)

(Attach Acknowledgment)

Surety

By _____
(Attorney-in-Fact)

Notice: No substitution or revision to this bond form will be accepted. Sureties must be authorized to do business in and have an agent for service of process in California.

All bond forms must be acknowledged before a Notary Public by both the Contractor and the Surety. Attorneys-in-fact who sign bond forms must file with each bond a certified and effective dated copy of their power of attorney.

Performance Bond

We, _____

as Contractor, and _____

as Surety, jointly and severally, bind ourselves, our heirs, representatives, successors and

assigns, as set forth herein, to the **City of Los Banos** (herein called "Owner") for payment

of the penal sum of _____

_____ Dollars (\$ _____),

lawful money of the United States. Owner has awarded the contract and entered into an

Agreement with the Contractor for the construction of:

OLIVEIRA PARK RENOVATIONS

The condition of this obligation is such that if the Contractor shall in all things abide by and well and truly keep and perform the covenants, and agreements in the said Contract Agreement, and any alteration thereof made as therein provided, on his part to be kept and performed at the time and in the manner therein specified, and shall faithfully fulfill the one-year guarantee of all materials and workmanship, and shall indemnify and save harmless the Owner and the Owner's Representative, and their consultants, and each of their directors, officers, employees and agents, as therein stipulated, this obligation shall become null and void, otherwise, it shall be and remain in full force and effect.

This Performance Bond shall remain in full effect during the one-year guaranty period following the completion of the work.

Surety agrees that no change, extension of time, alteration, or addition to the terms of the General Provisions, Special Provisions, and Technical Specifications in these Contract Documents shall in anyway affect its obligation in the bond, and it does hereby waive notice thereof.

Contractor and Surety agree that if the Owner is required to engage the services of an attorney in connection with the enforcement of this bond, each shall pay Owner's reasonable attorney's fees incurred with or without suit, in addition to the above sum.

[SIGNATURE SHEET BEGINS ON NEXT PAGE]

Executed in four original counterparts on : _____, 20____

Contractor

(Seal if Corporation)

By: _____

Title: _____

(Attach Acknowledgment of Authorized Representative of Contractor)

Any claims under this bond may be addressed to:

_____ (name and address of Surety)

_____ (name and address of Surety's agent for service of process in California, if different from above)

_____ (phone number of Surety's agent in California)

(Attach Acknowledgment)

Surety

By _____
(Attorney-in-Fact)

Notice: No substitution or revision to this bond form will be accepted. Sureties must be authorized to do business in and have an agent for service of process in California.

All bond forms must be acknowledged before a Notary Public by both the Contractor and the Surety. Attorneys-in-fact who sign bond forms must file with each bond a certified and effective dated copy of their power of attorney.

Notice of Award

To: _____

Date: _____
Project: _____

The Owner has considered the bid submitted by you for the above described work dated _____, 20____.

You are hereby notified that your bid has been accepted for the unit and lump sum prices set forth in the Bid Schedule totaling \$_____.

You are required by the Information for Bidders to execute the Agreement and furnish the required Contractor's performance bond and payment bond within ten (10) calendar days for the date of this Notice to you.

Before the Notice to Proceed can be issued, all required certificates of insurance, as stated in Section 29 of the General Provisions, and a copy of your Los Banos Business License must be submitted.

If you fail to execute said Agreement and to furnish said bonds within ten days from the date of this Notice, said Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your bid as abandoned and as a forfeiture of your Bid Bond. The Owner will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this Notice of Award to the Owner.

Owner

By _____

Title _____

ACCEPTANCE OF NOTICE

Receipt of the above Notice of Award is hereby acknowledged by

(Name of Contractor)

this _____ day of _____, 20____

By _____

Title _____

Notice to Proceed

To: _____

Date: _____
Project: _____

You are hereby notified to commence work in accordance with the Agreement dated _____, 20_____, on or before _____20_____, and you are to complete the work by _____, 20_____.

You are required to return an acknowledged copy of this Notice to Proceed to the Owner.

Owner

By _____

Title _____

ACCEPTANCE OF NOTICE

Receipt of the above Notice to Proceed is hereby acknowledged by

(Name of Contractor)

this _____ day of _____, 20_____

By _____

Title _____

Change Order

Order No. _____

Date: _____

Agreement Date: _____

Project: _____

Owner: _____

Contractor: _____

The following changes are hereby made to the Contract Documents:

Justification:

Change to Contract Price:

Original Contract Price: \$ _____

Current Contract Price adjusted by previous
Change Order: \$ _____

The Contract Price due to this Change Order
will be (increased) (decreased) by: \$ _____

The new Contract Price including this
Change Order will be: \$ _____

Change to Contract Time:

The Contract Time will be (increased) (decreased) by
calendar days. _____

The date for completion of all work will be: _____

The undersigned hereby agrees to the above-described amendment of the Agreement.

Contractor

Owner

This Change Order shall become a part of the Contract Documents only upon signature of both parties.

General Provisions

1. Terms and Definitions

Wherever used in the Contract Documents, the following terms shall have the meanings indicated, which shall be applicable to both the singular and plural thereof:

Addenda - Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the Contract Documents, by additions, deletions, clarifications or corrections.

ANSI – American National Standards Institute, current designation as of the Bid date unless otherwise indicated.

ASME – American Society of Mechanical Engineers, current designation as of the Bid date unless otherwise indicated.

ASTM – American Society for Testing Materials, current designation as of the Bid date unless otherwise indicated.

AWWA – American Water Works Association, current designation as of the Bid date unless otherwise indicated.

Bid - The offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the work to be performed.

Bidder - Any person, firm or corporation submitting a bid for the work.

Bonds - Bid, Performance and Payment Bonds and other instruments of security, furnished by the Contractor and his surety in accordance with the Contract Documents.

Change Order - A written order to the Contractor authorizing an addition, deletion or revision in the work within the general scope of the Contract Documents, or authorizing an adjustment in the contract price or contract time.

Completion - That date as certified by the Engineer when the construction of the project or a specified part thereof is sufficiently completed, in accordance with the Contract Documents, so that the project or specified part can be utilized for the purposes for which it is intended.

Contract Documents - the contract, including Advertisement for Bids, Information for Bidders, Bid, including Bid Representations and Certifications, Bid Bond, Agreement, Payment Bond, Performance Bond, Notice of Award, Notice to Proceed, Change Order, General Provisions, Special Provisions, Technical Specifications, Drawings, and Addenda.

Contract Price – The total monies payable to the Contractor under the terms and conditions of the Contract Documents.

Contract Time – The number of calendar or working days as stated in the Contract Documents for the completion of the work.

Contractor – The person, firm or corporation with whom the Owner has executed the Agreement.

Drawings – The part of the Contract Documents which shows the characteristics and scope of the work to be performed and which have been prepared or approved by the Engineer.

Engineer – City Engineer of the City of Los Banos, acting either directly or through properly authorized agents, such agents, acting within the scope of the particular duties entrusted to them.

Field Order – A written order effecting a change in the work not involving an adjustment in the contract price or an extension of the contract time, issued by the Engineer to the Contractor during construction.

IEEE – Institute of Electrical and Electronics Engineers, current designation as of the bid date unless otherwise indicated.

NEMA – National Electrical Manufacturers Association, current designation as of the bid date unless otherwise indicated.

Notice of Award – The written notice of the acceptance of the Bid from the Owner to the successful bidder.

Notice to Proceed – Written communication issued by the Owner to the Contractor authorizing him to proceed with the work and establishing the date of commencement of the work.

Owner – City of Los Banos.

Production Data – All illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate a material, product or system for some portion of the work.

Project – The undertaking to be performed as provided in the Contract Documents.

REA – Rural Electrification Association, current designation as of the bid date unless otherwise indicated.

Samples – Physical examples which illustrate materials, equipment or workmanship, and establish standards by which the work will be judged.

Shop Drawings – All drawings, diagrams, schedules and other data which are specifically prepared for the work by the Contractor, a subcontractor, manufacturer, supplier or distributor, to illustrate some portion of the work.

Specifications – A part of the Contract Documents consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship.

Standards - City of Los Banos Standard Specifications, The Standard Specifications of the Department of Transportation of the State of California (Caltrans) dated 2010 and subsequent updates to that 2010 edition, and The Standard Plans of the Department of Transportation of the State of California (Caltrans) dated 2010 and subsequent updates to this 2010 edition.

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 at the site.

Supplier – Any person or organization who supplies materials or equipment for the work, including that fabricated to a special design, but who does not perform labor at the site.

Work – All labor necessary to produce the construction required by the Contract Documents, and all materials and equipment incorporated or to be incorporated in the project.

Written Notice – Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the work.

2. Order of Precedence of Contract Documents

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

1. Permits from other agencies as may be required by law
2. Change orders
3. Agreement
4. Addenda
5. Contractor's Bid (Bid Form)
6. Advertisement for Bids
7. Information for Bidders
8. Supplementary General Conditions
9. General Provisions
10. Special Provisions
11. Technical Specifications
12. Drawings
13. Referenced Standard Specifications

If the conflicts cannot be resolved by the precedence prescribed above, the most stringent requirements shall prevail.

3. Venue

Contractor, and any subcontractor, supplier and any other person or organization performing any part of work, agree that each of them will waive jurisdiction and venue and shall submit to the jurisdiction of the courts of the State of California in the County of Merced, regardless of residence or domicile, with respect to any actions or suits at law or in equity arising under or related to the bidding, award or performance of the work or with regard to any matter whatsoever arising out of or relating to the validity, construction, interpretation or reinforcement of the Agreement as against Owner or any of their consultants, and/or any of their respective directors, officers, employees, representatives or agents.

4. Giving Notice

Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

5. Cumulative Remedies

The duties and obligations imposed by these General Provisions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon Contractor by the General Provisions and all of the rights and remedies available to Owner thereunder are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by laws or regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply.

6. Non-discrimination

During the performance of the project, Contractor and subcontractors shall not unlawfully discriminate

against any employee or applicant for employment because of race, color, ancestry, religion, sex, national origin, marital status, age, medical condition (cancer related), physical handicap (including AIDS), or sexual orientation. Equal employment extends, but is not limited to recruitment, compensation, benefits, layoff, termination, and all other conditions of employment. Contractor and subcontractors shall ensure that the evaluation/treatment of their employees and applicants for employment are free of such discrimination. Contractor and subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Government Code, Section 12900 et seq.) and the applicable regulations promulgated there under (California Administrative Code, Title 2, Section 7285.0 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code, Section 12900, set forth in Chapter 5 of Division 4 of Title 2 of the California Administrative Code and incorporated into this agreement by reference and made a part hereof as if set forth in full.

Contractor and any subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement.

Contractor shall include the nondiscrimination and compliance provisions of the clause in all subcontracts to perform work under the contract.

Contractor shall grant access by representative of the Department of Fair Employment and Housing and the Owner upon reasonable notice at any time during normal business hours, but in no case less than twenty-four (24) hours notice, to such of its books, records, accounts, other sources of information and its facilities as said Owner shall require to ascertain compliance with this clause.

7. Non-discrimination of the Disabled

The Owner will not aid or perpetuate discrimination against a qualified disabled individual by funding as an agency, organization, or person that discriminates on the basis of handicap in providing aid, benefit, or service to beneficiaries of the program or activity. The Owner is committed to provide access to all Owner services, programs, and meetings open to the public for people with disabilities. In this regard the Owner and all of its vendors and Contractor will take all reasonable steps to ensure that disabled individuals have the maximum opportunity for the same level of aid, benefit, or service as any other individual.

8. Additional Instructions and Detail Drawings

The Contractor may be furnished additional instructions and detail drawings by the Engineer, as necessary to carry out the work required by the Contract Documents. The additional drawings and instructions thus supplied will become a part of the Contract Documents. The Contractor shall carry out the work in accordance with the additional detail drawings and instructions.

9. Schedules, Reports and Records

The Contractor shall submit to the Owner such schedules, reports, records and other data as the Owner may request concerning work performed or to be performed.

Prior to the first partial payment estimate, the Contractor shall submit schedules showing the order in which he proposed to carry on the work, including dates at which he will start the various parts of the work, estimated date of completion of each part and, as applicable:

- A. A detailed cost breakdown of the work under each bid item awarded. The breakdown, after receiving favorable review by the Engineer, will become the basis for partial payment determination. Elements of work shall be grouped by building, structure, pipeline, system, etc. Within each grouping, work shall be itemized by readily measurable quantities of work completed in place. For example, concrete should be in units of cubic yard including form work and reinforcing steel. Mobilization costs, bond and insurance costs, and overhead costs shall not be prorated over items of work. In the event the cost breakdown is not favorably reviewed by the Engineer, another cost breakdown shall be submitted that is mutually acceptable to the Contractor and the Engineer.
- B. The dates at which special detail drawings will be required; and respective dates for

submission of shop drawings, the beginning of manufacture, the testing and the installation of materials, supplies and equipment. The Contractor shall also submit a schedule of payments that he anticipates he will earn during the course of the work.

10. Drawings and Specifications

The intent of the drawings and specifications is that the Contractor shall furnish all labor, materials, tools, equipment, and transportation necessary to complete the project in an acceptable manner, ready for use, occupancy or operation by the Owner.

In case of conflict between the drawings and specifications, the specifications shall govern. Figure dimensions on drawings shall govern over scale dimensions and detailed drawings shall govern over general drawings.

Any discrepancies found between the drawings and specifications and site condition or any inconsistencies or ambiguities in the drawings or specifications shall be immediately reported to the Engineer, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. Work done by the Contractor after his discovery of such discrepancies, inconsistencies or ambiguities shall be done at the Contractor's risk.

The Owner will furnish to the Contractor, free of charge, six copies of drawings and specifications for the work. The Contractor shall keep one copy of all current drawings and specifications on the job site, in good order, available to the Engineer and his representatives.

All drawings, specifications, and copies thereof furnished by the Owner are the property of the Owner. They are not to be used on other work, and, with the exception of the signed contract set, are to be returned to the Owner on request, at the completion of the work.

11. Shop Drawings, Production Data and Samples

The Contractor shall review, approve and submit to the Engineer all Shop Drawings, Production Data and Samples as may be necessary for prosecution of the Work and as required by the Contract Documents. The Contractor shall review and approve all Shop Drawings, Production Data and Samples prior to submitting them to the Engineer. By approving and submitting Shop Drawings, Production Data and Samples, the Contractor represents that he has determined and verified all materials, measurements and criteria related thereto, and that he has checked and coordinated the information contained within such submittals with the requirements of the Contract Documents. Any Shop Drawing, Production Data or Sample submitted to the Engineer without having been approved by the Contractor will be returned unreviewed to the Contractor.

For each item where shop drawings, production data or samples are required, the Contractor shall submit a minimum of six approved sets, hard copies, or one set, electronically. The Engineer shall review all shop drawings, production data and samples and retain three sets after his review. The remaining sets shall be returned to the Contractor with actions defined as follows:

- A. NO EXCEPTIONS TAKEN – Accepted subject to its compatibility with future submissions and additional partial submissions for portions of the work not covered in this submission.
- B. MAKE CORRECTIONS NOTED – Same as NO EXCEPTIONS TAKEN except that minor corrections as noted shall be made by the Contractor.
- C. REVISE AND RESUBMIT – Rejected because of major inconsistencies or errors which shall be resolved by the Contractor prior to subsequent review by the Engineer.
- D. REJECTED – Submitted material does not conform to Contract Documents in major respect.

The Engineer's review is only for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. It shall not include review of quantities, dimensions, weights or gauges, fabrications processes, construction methods, coordination with other trades, or construction safety precautions, all of which are the responsibility of the Contractor.

The Engineer shall not be responsible for any deviations from the Contract Documents not brought to the attention of the Engineer in writing by the Contractor and acknowledged in writing by the Engineer.

Portions of the work requiring shop drawings, production data and samples shall not begin until the submission has been favorably reviewed by the Engineer. A copy of each favorably reviewed shop drawing, product data and sample shall be kept in good order by the Contractor at the site and shall be available to the Engineer.

12. Materials, Services and Facilities

It is understood that, except as otherwise specifically stated in the Contract Documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the work within the specified time.

Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the work. Stored materials and equipment to be incorporated in the work shall be located so as to facilitate prompt inspection.

Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

Materials, supplies and equipment shall be in accordance with samples submitted by the Contractor and reviewed by the Engineer.

Materials, supplies or equipment to be incorporated into the work shall not be purchased by the Contractor or any subcontractor subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

13. Inspection and Testing

All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the Contract Documents.

The Contractor shall provide, at his expense, the necessary testing and inspection services required by the Contract Documents, unless otherwise provided. (See Section 6 of the Special Provisions)

The Owner shall provide all other inspections and testing services not required by the Contract Documents. If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction specifically require any work to be inspected, tested, approved by someone other than the Contractor, the Contractor will give the Engineer timely notice of readiness. The Contractor will then furnish the Engineer the required certificates of inspection, testing or approval.

Neither observations by the Engineer nor inspections, tests or approvals by persons other than the Contractor shall relieve the Contractor from his obligations to perform the Work in accordance with the requirements of the Contract Documents.

The Engineer and his representatives will at all times have access to the Work. In addition, authorized representatives and agents of the Owner and appropriate Federal or State agencies shall be permitted to inspect all work, material, payrolls, records of personnel, invoices of materials, and other relevant data and records. The Contractor will provide proper facilities for such access and observation of the Work and also for any inspection or testing thereof.

If any work is covered contrary to the written request of the Engineer, it must, if requested by the Engineer be uncovered of his observation and replaced at the Contractor's expense.

If any work has been covered which the Engineer has not specifically requested to observe prior to it being covered, or if the Engineer considers it necessary or advisable that covered work be inspected or tested by others, the Contractor, at the Engineer's request, will uncover expose or otherwise make available for observation, inspection or testing as the Engineer may require, that portion of the work in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such work is

not found to be defective, the Contractor will be allowed an increase in the contract price of an extension of the contract time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate change order shall be issued.

14. Substitutions

Whenever a material, article or piece of equipment is identified on the Drawings or Specifications by reference to brand name or catalogue number, it shall be understood that this is referenced for the purpose of defining the performance of other salient requirements and that other products of equal capacities, quality and function shall be considered. The Contractor may recommend the substitution of a material, article or piece of equipment of equal substance and function for those referred to in the Contract Documents by reference to brand name or catalogue number, and if, in the opinion of the Engineer, such material, article, or piece of equipment is of equal substance and function to that specified, the Engineer may approve its substitution and use by the Contractor. The Contractor warrants that if substitutes are approved, no major changes in the function or general design of the project will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the Contractor without a change in the contract price or contract time.

15. Patents

The Contractor shall pay all applicable royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and save the Owner harmless from loss on account thereof, except that the Owner shall be responsible for any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is specified, but if the Contractor has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Engineer.

16. Surveys, Permits and Regulations

The Engineer will furnish lines and grades as required for the construction of the work. The Contractor shall make a general check of all lines, dimensions and elevations and shall make all necessary rechecks during the progress of the work to avoid errors in construction. The Contractor shall be responsible for proper dimensions and fittings of all items of work being performed by him. Should any discrepancy be found in lines, dimensions or elevations, they shall be reported to the Engineer immediately.

The Contractor shall protect all existing property and survey monuments, including survey control monuments for this work. The Contractor is responsible for protecting and preserving survey monuments and other survey markers. Any survey monuments damaged as a direct or indirect result of construction activities shall be re-established by a duly licensed land surveyor at the Contractor's sole expense. A corner record shall be filed in accordance with State law for any reset monuments at the Contractor's sole expense.

The Contractor shall carefully preserve benchmarks, reference points and stakes and, in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

Permits and licenses of a temporary nature necessary for the prosecution of the work shall be secured and paid for by the Contractor. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the Owner, unless otherwise specified. The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the Work as drawn and specified. If the Contractor observes that the Contract Documents are at variance therewith, he shall promptly notify the Engineer in writing, and any necessary changes shall be adjusted as provided in Paragraph 19 of these General Provisions, Changes in the Work.

17. Protection of Work, Property and Persons

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work. He will take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to all employees on the work and

other persons who may be affected thereby, all the work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

The Contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He shall erect and maintain, as required by the conditions and progress of the work, all necessary safeguards for safety and protection. He shall notify owners of adjacent utilities when prosecution of the work may affect them. The Contractor shall remedy all damages, injury or loss to any property caused, directly or indirectly, in whole or in part, by the Contractor, any subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, except damage or loss attributable to the fault of the Contract Documents or to the acts or omissions of the Owner or the Engineer or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the Contractor.

In emergencies affecting the safety of persons or the work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the Engineer or Owner, shall act to prevent threatened damage, injury or loss. He will give the Engineer prompt written notice of any significant changes in the work or deviations from the Contract Documents caused thereby, and a change order shall thereupon be issued covering the changes and deviations involved.

18. Supervision by Contractor

The Contractor shall supervise and direct the work. He shall be solely responsible for the means, methods, techniques, sequences and procedures of construction. The Contractor shall employ and maintain on the work, a qualified supervisor or superintendent who shall have been designated in writing by the Contractor as the Contractor's representative at the site. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the work.

19. Changes in the Work

The Owner may at any time, as the need arises, order changes within the scope of the work without invalidating the Agreement. If such changes increase or decrease the amount due under the Contract Documents, or in the time required for performance of the work, an equitable adjustment shall be authorized by written change order.

The Engineer may also, at any time, by issuing a field order, make changes in the details of the work. The Contractor shall proceed with the performance of any changes in the work so ordered by the Engineer unless the Contractor believes that such field order entitles him to a change in contract price or contract time, or both, in which event he shall give the Engineer written notice thereof within seven (7) days after the receipt of the ordered change, and the Contractor shall not execute such changes pending the receipt of an executed change order or further instruction from the Owner.

20. Changes in Contract Price

The contract price may be changed only by a written change order. The value of any work covered by a change order or of any claim for increase or decrease in the contract price shall be determined by one or more of the following methods in the order of precedence listed below:

- A. Unit prices previously approved.
- B. An agreed lump sum.
- C. If a lump sum or unit price cannot be mutually agreed upon, the Contractor shall be entitled to the sum of the following costs of doing the extra work:
 1. Direct Labor Costs. Charges for cost of all the labor furnished and used by the Contractor shall be made for manual classifications up to and including general foreman. It will not include charges for assistant superintendents, superintendents, office personnel,

timekeepers, and maintenance and mechanics. The time charged to extra work shall be subject to the daily approval of the Engineer and evidence of such daily approval shall be submitted with the billing. Labor rates used to calculate the costs shall be those so designated in the Advertisement for Bids. No time or charges will be allowed, except when the men are actually engaged in the proper, efficient, and diligent performance or completion of the extra work as authorized. Overtime shall not be worked without prior approval by the Engineer.

2. Equipment Costs. Charges for the rental and operation of the equipment furnished and used by the Contractor shall be made for all prime construction and automotive equipment. It will not include charges for equipment or tools with a new cost of \$1,000.00 or less. Equipment time charges must be subject to the daily approval submitted with the billing. The equipment rental and operation rates used shall be those agreed upon by the Engineer and the Contractor prior to commencement of the extra work. No time or charges will be allowed except when equipment is actually being used for the proper and efficient performance or completion of the extra work as authorized.

3. Material Costs. Charges for the cost of materials furnished by the Contractor shall be made providing such furnishing was specifically authorized in the extra work order and the actual use verified by the Engineer. Charges must be net cost to the Contractor delivered at the job, and vendor's invoice must accompany the billing along with verification of use of such materials by the Engineer.

4. Tools, Supplies, Overhead, Supervision and Profit. A charge for tools, supplies, overhead, supervision and profit will be allowed in the amount of 15% of the Total Direct Labor Costs, and Material Costs, as defined above.

Any extra work performed hereunder shall be subject to all of the provisions of the contract and the Contractor's sureties shall be bound with reference thereto as under the Contract.

21. Time for Completion and Liquidated Damages

The date of beginning and the time for completion of the work are essential conditions of the Contract Documents and the work embraced shall be commenced on a date specified in the Notice to Proceed.

Time is of the essence in this Agreement. The Contractor shall proceed with the work at such a rate of progress to ensure full completion within the contract time. It is expressly understood and agreed, by and between the Contractor and the Owner, that the contract time for the completion of the work described herein is a reasonable time.

The parties hereto agree that it is extremely difficult and impractical in this case to determine the actual damages the Owner will suffer if the Contractor fails to complete the work within the contract time and for said reason, if the Contractor shall fail to complete the work within the contract time, or extension of time granted by the Owner, then the Contractor will pay to the Owner the amount for liquidated damages as specified in the Agreement for each calendar day that the Contractor shall be in default after the time stipulated in the Contract Documents. The time for completion of the work shall be extended, and the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due to the following, and the Contractor has promptly given written notice of such delay to the Engineer:

- A. To any preference, priority or allocation order duly issued by the Owner.
- B. To unforeseeable caused beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God or of the public enemy, acts of the Owner, acts of another contractor in the performance of a contract with the Owner, fires, floods, epidemics quarantine restrictions, strikes, freight embargoes, and climatic conditions which, in the opinion of the Engineer, make prosecution of the work unreasonably difficult.
- C. To any delays of subcontractors occasioned by any of the causes specified in the above

paragraphs.

22. Correction of Work

The Contractor shall promptly remove from the premises all work rejected by the Engineer for failure to comply with the Contract Documents, whether incorporated in the construction or not, and the Contractor shall promptly replace and re-execute the work in accordance with the Contract Documents and without expense to the Owner and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement.

23. Suspension of Work, Termination and Delay

The Owner may, at any time and without cause, suspend the work or any portion thereof for a period of not more than ninety days, or such further time as agreed upon by the Contractor, by written notice to the Contractor and the Engineer, which notice shall fix the date on which work shall be resumed. The Contractor will resume that work on the date so fixed. The Contractor will be allowed an increase in the contract price or an extension of the contract time, or both, directly attributable to any such suspension.

If the Contractor is adjudged as bankrupt or insolvent, or if he makes a general assignment for the benefit of his creditors, or if a trustee or receiver is appointed for the Contractor or for any of his property, or if he files a petition to take advantage of any debtor's act or to reorganize under the bankruptcy or applicable laws, or if he repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if he fails to make prompt payments to subcontractors or for labor, materials or equipment or if he disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction over the work or if he disregards the authority of the Engineer, or if he otherwise violates any provision of the Contract Documents, then the Owner may, without prejudice to any other right or remedy and after giving the Contractor and his surety a minimum of ten (10) days from delivery of a written notice, terminate the services of the Contractor, and finish the work by whatever method he may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance, the Contractor shall pay the difference to the Owner. Such costs incurred by the Owner will be determined by the Engineer and incorporated in a change order.

Where the Contractor's services have been so terminated by the Owner, said termination shall not affect any right of the Owner against the Contractors then existing or which may thereafter accrue. Any retention or payment of monies by the Owner due the Contractor will not release the Contractor from compliance with the Contract Documents.

After ten (10) days from delivery of a written notice to the Contractor and the Engineer, the Owner may without cause and without prejudice to any other right or remedy, elect to abandon the project and terminate the contract. In such case, the Contractor shall be paid for all work executed and any expense sustained plus reasonable profit.

If, through an act or fault of the Contractor, the work is suspended for a period of more than ninety (90) days by the Owner or under an order of court or other public authority, or the Engineer fails to act on any request for payment within thirty (30) days after it is submitted, or the Owner fails to pay the Contractor substantially the sum approved by the Engineer or awarded by arbitrators within thirty (30) days of its approval and presentation, then the Contractor may, after the (10) days from delivery of a written notice to the Owner and the Engineer stop the work until he has been paid all amounts then due, in which event and upon resumption of the work, change orders shall be issued for adjusting the contract price or extending the contract time or both to compensate for the costs and delays attributable to the stoppage of the work.

24. Progress Estimates

On or about the last day of the calendar month, the Contractor will, except as hereinafter provided, make in writing and certify to the Owner an estimate which, in his opinion, is just and fair of the amount and value of the work completed by the Contractor up to that time in the performance of the contract. In case of work for which unit prices are named in the contract, the estimate shall be computed on the basis of said unit prices. In the case of work for which a lump sum is named in the contract, the Engineer may

use a breakdown of the lump sum price submitted by the Contractor, provided that such breakdown is submitted within 15 calendar days after the execution of the Agreement in a form acceptable to the Engineer. No payment will be made to the Contractor until such schedule has been submitted to and reviewed by the Engineer. To the figure thus arrived at shall be added any amounts due the Contractor for extra work and the amount of any approved claims for extra costs to the date of the progress estimate the retained percentage hereinafter provided for shall be deducted from the total thus computed; and from the remainder, there shall be further deducted any amounts due the Owner from the Contractor for supplies or materials furnished or services rendered and any other amounts that may be due the Owner under the terms of the contract. In preparing estimates for partial payment, consideration shall be given to delivery on the site of pipe, and fittings which will become a part of the finished construction work and for which payment in full has been made by the Contractor, but no consideration will be given to preparatory work done or other materials on hand. From the balance thus determined shall be deducted the amount of all previous payments and the remainder shall constitute the partial estimate for that month. Such partial estimates shall not be required to be made by strict measurement, but may be made by measurement or by estimation or partly by one method and partly by the other and it shall be sufficient if they are approximate only. Partial estimates may be withheld or reduced if, in the opinion of the Engineer, the Contractor is not diligently and efficiently endeavoring to comply with the intent of the Agreement.

25. Progress Payments

The Owner will make payments on account of the contract as follows: Not later than the 30th day of the month following the month in which the contract is awarded, and the 30th day of each calendar month thereafter, the Owner will pay to the Contractor 95% of the amount earned by the Contractor during the preceding month at the rate of prices set forth in the contract, based on the estimate of the Engineer.

The retention will be held by the Owner until 35 days following filing of the Notice of Completion.

26. Prompt Payment

The Contractor shall promptly pay all subcontractors and suppliers within ten (10) days of receipt of any progress payment, final payment or retention paid by the Owner to the Contractor. Contractor shall advise all subcontractors and suppliers that all second-tier subcontractors and suppliers must be paid within then (10) days of their receipt of payment from the Contractor.

27. Acceptance and Final Payment

Upon receipt of written notice from the Contractor that the work is ready for final inspection and acceptance, the Engineer will promptly make such inspection, and when he finds the work acceptable under the contract, and the contract fully performed, he will promptly issue a final certificate, over his own signature, stating that the work required by this contract has been completed. The Owner then shall issue a formal Notice of Completion, and the entire balance found to be due shall be paid to the Contractor by the Owner 35 days from the date of recording by the Owner of the Notice of Completion of all work covered by this contract.

Before issuance of the Notice of Completion, the Contractor shall submit evidence satisfactory to the Owner that all payrolls, material bills, and other indebtedness connected with the work have been paid, or if not paid, then the Contractor shall submit evidence of the status of any unpaid indebtedness.

The making and acceptance of the final payment shall constitute a waiver of all claims by the Owner except the following:

- A. those arising from unsettled liens;
- B. those arising from faulty work appearing within 12 months after the date of filing of the Notice of Completion;
- C. those arising from failure to meet the requirements of the Contract Documents or the specifications; or,

- D. those arising from manufacturers' guarantees.

The acceptance by Contractor of the final payment referred to in this paragraph 27 herein, shall be a release of Owner from all claims of liability to Contractor for anything done or furnished for, or relating to, the work or for any act or neglect of Owner or of any person relating to or affecting the work, except demands against Owner for the remainder, if any, of the amounts kept or retained under the provisions of Paragraph 25, Progress Payments, herein; and excepting pending, unresolved claims.

28. Quantities and Unit Prices

The quantities noted in the schedule are approximation for comparing bids, and no claim shall be made against the Owner for excess or deficiency therein. Payment at the unit prices set forth in the schedule will constitute payment in full for the completed work and will include materials, supplies, labor, tools, machinery, and all other expenditures incident to satisfactory compliance with the contract, unless otherwise specifically provided.

The quantities of work performed will be computed for payment by the Engineer on the basis of measurements taken by the Engineer, and these measurements shall be final and binding.

29. Insurance

The Contractor shall not commence work under this Agreement until he has obtained all the insurance required under this section and such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work on his subcontract until the insurance required of the subcontractor has been so obtained and approved. All insurance required under this section shall be maintained at the expense of the Contractor continuously during the life of the contract up to the date of acceptance of the work by the Owner.

Commercial General Liability and Automobile Liability Insurance – The Contractor shall provide and maintain the following commercial general liability and automobile liability insurance:

- A. Coverage – Coverage for commercial general liability and automobile liability insurance shall be at least as broad as the following:
1. Insurance Services Office Commercial General Liability coverage (Occurrence Form CG 0001)
 2. Insurance Service Office Form Number CA 0001 (ed. 1/87) covering Automobile Liability, Code 1 (any auto)
- B. Limits – The Contractor shall maintain limits no less than the following:
1. General Liability – Two million dollars (\$2,000,000) per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to the project/location (with the ISO CG 2501 or insurer's equivalent endorsement provided to the Owner) or the general aggregate limit shall be twice the required occurrence limit.
 2. Automobile Liability – One million dollars (\$1,000,000) per accident for bodily injury and property damage combine single limit.
- C. Required provisions – The general liability and automobile liability policies are to contain, to be endorsed to contain the following provisions:
1. The Owner and its directors, officers, employees, agents and volunteers are to be covered as 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, occupied or used by the Contractor, or automobiles owned, leased, hired or borrowed by the Contractor. The coverage shall contain no special

limitations on the scope of protection afforded to the Owner and its directors, officers, employees, agents, and volunteers.

2. For any claims related to this work, the Contractor's insurance shall be the primary insurance as respects the Owner and its directors, officers, employees, agents and volunteers. Any insurance, pooled coverage or self-insurance maintained by the Owner and its directors, officers, employees, agents and volunteers shall not contribute to it.
 3. Any failure to comply with reporting or other provisions of the policies including breaches of warranties shall not affect coverage provided to the Owner and their directors, officers, employees, agents and volunteers.
 4. 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.
 5. Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the Owner.
- D. Deductibles and Self-Insured Retentions – Any deductible or self-insured retention must be declared to and approved by the Owner. At the option of the Owner, either the insurer shall reduce or eliminate such deductibles or self-insured retentions.
- E. Acceptability of Insurers – Insurance is to be placed with insurers having a current A.M. Best's rating of no less than A-: VII or equivalent.

Workers' Compensation and Employer's Liability Insurance – The Contractor and all subcontractors shall cover or insure under the applicable laws relating to workers' compensation insurance, all of their employees working on or about the construction site, regardless of whether such coverage or insurance is mandatory or merely elective under law, and the Contractor shall defend, protect and save harmless the Owner and its directors, officers, employees, agents and volunteers from and against all claims, suits, and actions arising from any failure of the Contractor or any subcontractor to maintain such insurance. Before beginning work, Contractor shall furnish to the Owner satisfactory proof that Contractor has taken out for the period covered by the work under this Contract, full compensation insurance for all persons employed directly by Contractor or through subcontractors in carrying out the work contemplated under this Contract, all in accordance with the "Workers' Compensation and Insurance Act," Division IV of the Labor Code of the State of California and any Acts amendatory thereof.

The Contractor shall provide employer's liability insurance in the amount of, at least, \$1,000,000 per accident for bodily injury and disease.

The Contractor shall provide the Owner with a certificate of Workers' Compensation and Employers liability insurance coverage.

In signing the Agreement, Contractor makes the following certification required by Section 1861 of the Labor Code:

"I am aware of the provisions of Section 3700 of the Labor Code which requires each employer to be insured against liability for workmen's 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."

Evidences and Cancellation of Insurance – Prior to execution of the Agreement, the Contractor shall file with the Owner evidence of insurance from an insurer or insurers certifying to the coverage of all insurance required herein. Such evidence shall include original copies of the ISO CG 2010 (or insurer's

equivalent) signed by the insurer's representative and certificate of insurance (Accord Form 25-S or equivalent). All evidence of shall be certified by a properly authorized officer, agent or qualified representative of the insurer and shall certify the names of the insured, any additional primary insurers, where appropriate, the type and amount of the insurance, the location and operations to which the insurance applies, the expiration date, and that the insurer will give by certified mail, written notice to the Owner at least thirty (30) days prior to the effective date of any cancellation, lapse or material change in the policy.

The Contractor shall, upon demand of the Owner, deliver to the Owner all such policy or policies of insurance and the receipts for payment of premiums thereon; and should the Contractor neglect to obtain and maintain in force any such insurance or deliver such policy or policies and receipts to the Owner, then it shall be lawful for the Owner to obtain and maintain such insurance, and the Contractor hereby appoints the Owner the true and lawful attorney-in-fact to do all things necessary for this purpose. All money paid by the Owner for insurance premiums under the provisions of this article shall be charged to the Contractor.

30. Contract Security

The Contractor shall, within ten (10) days after the receipt of the Notice of Award, furnish the Owner with a performance bond and a payment bond in penal sums equal to 100% of the contract price, conditioned upon the performance by the Contractor of all undertakings, covenants, terms, conditions and agreements of the Contract Documents, and upon the prompt payment by the Contractor to all persons supplying labor and materials in the prosecution of the work provided by the Contract Documents. Such bonds shall be executed by the Contractor and corporate bonding company licensed to transact such business in the state in which the Work is to be performed and named on the current list of "Surety Companies Acceptable Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these bonds shall be borne by the Contractor. If at any time a surety on any such bond is declared a bankrupt or loses its right to do business in the state in which the work is to be performed or is removed from the list of surety companies accepted on Federal bonds, Contractor shall within ten (10) days after notice from the Owner to do so, substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner. The premiums on such bond (s) shall be paid by Contractor. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable bond to the Owner.

Attached to the bonds shall be the original, or a certified copy, of the unrevoked appointment, power of attorney, bylaws or other instrument which entitles and authorizes the person to execute the bond to do so, a certified copy of the certificate of authority or the insurer issued by the Insurance Commissioner of the county in which the Owner is located which would state that the certificate of authority of the insurer (the bonding company) has not been surrendered, revoked, cancelled, annulled, or suspended.

The performance bond shall remain in full force and effect during the warranty period of 12 months from the date of acceptance of the work by the Owner.

If requested by the Owner or Engineer, 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, shall be provided to the Owner or Engineer within 10 calendar days of the insurer's receipt of the request to submit the statements.

31. Assignments

Neither the Contractor nor the Owner shall sell, transfer, assign or otherwise dispose of the contract or any portion thereof, or of his right, title or interest therein, or his obligation thereunder, without written consent of the other party.

32. Indemnification

Contractor shall indemnify and hold harmless and defend the Owner and the Engineer and their directors, officers, employees, agents or volunteers, and each of them from and against:

- A. Any and all claims, demands, causes of action, damages, costs, expenses, losses or liabilities, in law or in equity, of every kind and nature whatsoever for, but not limited to, injury to or death of any person including Owner and/or Engineer and/or Contractor, or any directors, officers, employees, agents volunteers of the Owner, Engineer or Contractor, and damages to or destruction of property of any person, including but not limited to, Owner, Engineer and/or Contractor and their directors, officers, employees, agents or volunteers arising out of or in any manner directly or indirectly connected with the work to be performed under this Agreement, however caused regardless of any negligence of the Owner or the Engineer or their directors, officers, employees, agents, or volunteers, except the sole negligence of willful misconduct or active negligence of the Owner or the Engineer or their directors, officers, employees, agents or volunteers:
- B. Any and all actions, proceedings, damages, costs, expenses, penalties or liabilities in law or equity, of every kind or nature whatsoever, arising out of , resulting from or on account of the violation of any governmental law or regulation, compliance with which is the responsibility of Contractor.

Contractor shall defend, at Contractor's own cost, expense and risk, any and all such aforesaid suits, actions or other legal proceedings of every kind that may be brought or instituted against the Owner and the Engineer or their directors, officers, employees, agents or volunteers.

Contractor shall pay and satisfy any judgment, award or decree that may be rendered against the Owner and their directors, officers, employees, agents, or volunteers in any such suit, action or other legal proceedings.

Contractor shall reimburse the Owner and their directors, officers, employees, agents and/or volunteers, for any and all legal expenses and costs incurred by them in connection therewith or in enforcing the indemnity herein provided.

Contractor agrees to carry insurance for this purpose as set out in the specifications. See Paragraph 29 of these General Provisions for insurance specifications and coverage. Contractor's obligation to indemnify shall not be restricted to insurance proceeds, if any, received by the Owner and the Engineer or their directors, officers, employees, agents and/or volunteers.

33. Separate Contracts

The Owner reserves the right to let other contracts in connection with this project. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs. If the proper execution or results of any part of the Contractor's work depend upon the work of any other contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such work that render it unsuitable for such proper execution and results.

The Owner may perform additional work related to the project by himself, or he may let other contracts containing provisions similar to these. The Contractor will afford the Contractors who are parties to such contracts (or the Owner, if he is performing the additional work himself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of work, and shall properly connect and coordinate his work with theirs.

In the performance of additional work by other contractors or the Owner is not noted in the Contract Documents prior to the execution of the Agreement, written notice thereof shall be given to the Contractor prior to starting any such additional work. If the Contractor believes that the performance of such requires additional expense or entitles him to an extension of the contract time, he may make a claim therefore as provided in Items 19 and 20 of these General Provisions.

34. Subcontracting

The Contractor may utilize the services of specialty subcontractors on those parts of the work which, under normal contracting practices, are performed by specialty subcontractors.

The Contractor shall be fully responsible to the Owner for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them, as he is of the acts and omissions of persons directly employed by him.

The Contractor shall cause appropriate provisions to be inserted in all contracts relative to the work to bind subcontractors to the Contractor by the terms of the Contract Documents in so far as applicable to the work of subcontractors and to give the Contractor the same power as regards terminating any subcontract that the Owner may exercise over the Contractor under any provision of the Contract Documents.

Nothing contained in this contract shall create any contractual relation between any subcontractor and the Owner.

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

35. Employment of Apprentices

The Contractor and any subcontractor under him shall comply with the requirements of Sections 1777.5 and 1777.6 of the Labor Code in the employment of apprentices. The responsibility for compliance with the provisions of said Section 1777.5 for all apprenticeship occupations shall rest with the Contractor. Information relative to apprenticeship standards, wage schedules and other requirements may be obtained from the Division of Apprenticeship Standards, 455 Golden Gate Avenue, San Francisco, California, or from its branch offices.

36. Payment of Prevailing Wages

The Contractor and all subcontractors under him shall pay all laborers, workmen and mechanics on all work included in this contract no less than the general prevailing rate of per diem wages for work performed, (to-wit, within the limits of the City), and no less than the general prevailing rate of per diem wages for legal holiday and overtime work in said locality, which per diem wages shall not be less than the stipulated rate contained in a schedule thereof which has been ascertained and determined by the Council to be the general prevailing rate of per diem wages for each craft or type of workman or mechanic needed to execute this contract, and which is now on file with the City Clerk, as set forth in the Information for Bidders, and by reference it is incorporated herein and made a part hereof.

The Contractor shall forfeit, as a penalty to the Owner, two hundred dollars (\$200.00) for each laborer, workman or mechanic employed for each calendar day or portion thereof such laborer, workman or mechanic is paid less than the said stipulated rates for any work done under this contract by him or by any subcontractor under him in violation of Articles 1 and 2 of Chapter 1 Part 7 of Division 11 of the Labor Code of the State of California, and said sums and amounts which shall have been so forfeited pursuant to the herein paragraph and the said terms of said Labor Code shall be withheld and retained from payments due to the Contractor under said contract, pursuant to this contract and the said terms of said Labor Code; but no sum shall be so withheld, retained or forfeited except from the final payment without a full investigation by either the Division of Labor law Enforcement of the State Department of Industrial Relations or by said Council.

The difference between such stipulated prevailing wage rates and the amount paid to each workman for each calendar day, or a portion thereof, for which each workman was paid less than the stipulated prevailing wage rate shall be paid to each workman by the Contractor. The Contractor shall comply with the provisions of Section 1775 of the Labor Code of the State of California.

The Contractor and his subcontractors shall submit certified payroll information electronically to the Department of Industrial Relations as well as a hard copy of said certified payrolls to the Owner on a monthly basis.

37. Registration to Train Apprentices

Pursuant to Labor Code Section 1777.5, all contractors shall file with the appropriate Joint Apprenticeship Training Committee, a DAS-140 form registering to train apprentices. This requirement to register to train apprentices is mandated by Section 1777.5 whether or not you are signatory to or a party of any approved training program. Only those programs approved by the California Apprenticeship Council are applicable to accept DAS-140 registration forms.

If the contractor is approved to train apprentices, then apprentices must be called in a ratio not less than one apprentice hour for each five journeyman hours.

However, if the entire contract may be completed within 20 working days or the entire contract (nor subcontracts) is less than thirty thousand (\$30,000), then the Contractor is exempt from requesting apprentices under Labor Code Section 1777.5.

In addition, all contractors are required to make appropriate training contributions as set forth in the prevailing wage determination to each appropriate JATC, or in the alternative, to the California Apprenticeship Council. Payments shall be made not less than monthly, calculated and paid by the fifteenth of each month, for work performed that prior month.

The address for the applicable Joint Apprenticeship Training Committee and for the California Apprenticeship Council can be obtained by calling the Division of Apprenticeship Standards.

38. Penalties

Failure to pay the appropriate prevailing wage can result in penalties being assessed as follows:

- A. Up to \$50.00 per day per worker for each and every violation; and,
- B. debarment from future public works for a period not to exceed three years.
- C. \$50.00 per day per worker for each failure to comply with the payment of overtime for all hours worked in excess of 8 in one day or 40 in one week.

Failure to register to train apprentices or failure to pay the appropriate training contribution can result in penalties being assessed as follows:

- A. \$100.00 per day for each day of violation; and,
- B. debarment from future public works for a period not to exceed three years.

39. Engineer's Authority

The Engineer shall act as the Owner's representative. He shall decide questions which may arise as to quality and acceptability of materials furnished and work performed. He shall interpret the intent of the Contract Documents in a fair and unbiased manner. The Engineer will make visits to the site and determine if the work is proceeding in accordance with the Contract Documents.

The Contractor will be held strictly to the intent of the Contract Documents in regard to the quality of materials, workmanship and execution of the work. Inspections may be made at the factory or fabrication plant of the source of material supply.

The Engineer will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.

40. Land and Rights-of-Way

Prior to issuance of the Notice to Proceed, the Owner shall obtain all land and rights-of-way necessary for carrying out and for the completion of the work to be performed pursuant to the Contract Documents, unless otherwise mutually agreed.

The Owner shall provide to the Contractor information which delineates and describes the lands owned and rights-of-way acquired.

The Contractor shall provide, at his own expense and without liability to the Owner, any additional land and access thereto that the Contractor may desire for temporary construction facilities, or for storage of materials.

41. Warranty and Guarantee

Contractor warrants and guarantees to Owner that all work will be in accordance with the Contract Documents and will not be defective. Prompt notice of defects known to Owner shall be given to Contractor. All defective work, whether or not in place, may be rejected, corrected or accepted as provided in Paragraph 19, Changes in the Work, of these General Provisions. Defective work may be rejected even if approved by prior inspection.

42. One (1) Year Warranty Period

The warranty period shall commence when the Notice of Completion is issued, at notice of beneficial occupancy or at notice of partial utilization of the work to be warranted has been issued, or a later date if so specified in the Agreement, or mutually agreed to, and extend until one (1) year after that date or whatever longer period may be prescribed by laws or regulations or by the terms of any applicable special guarantee or specific provision of the Contract Documents.

43. Correction of Defective Work

If within the designated warranty period, or such longer period as may be required by Laws or Regulations, the work, or any part of the work, is discovered to be defective, Contractor shall promptly, without an adjustment in contract price and in accordance with Owner's written instructions, either correct that defective work, or if it has been rejected by Owner, remove it from the site and replace it with non-defective work. If circumstances warrant it, including but not limited to, in an emergency, Owner may have the defective work corrected or the rejected work removed and replaced. In that event, Contractor shall not be allowed to recover any associated costs, and he shall reimburse Owner for all direct, indirect and consequential costs of Owner, and Owner shall be entitled to an appropriate decrease in contract price, to withhold a set-off against amount recommended for payment, or make a claim on Contractor's bond if Contractor has been paid in full. Where defective work (and damage to other work resulting therefrom) has been corrected, removed or replaced during the warranty period, the one (1) year warranty period with respect to such work will be extended for an additional period of one (1) year after such correction or removal and replacement has been satisfactorily completed.

44. Early Completion

The one (1) year warranty period will not begin until the Notice of Completion is filed. If Contractor completes the work or portions thereof prior to this time, he shall preserve the equipment and/or facilities by developing and implementing a preventive maintenance program in compliance with manufacturer's recommendations to maintain the equipment and/or facilities unless Owner has issued a notice of beneficial occupancy or notice of partial utilization for the warranted work. At start up, Contractor will be required to get his equipment and/or facilities ready to put into service.

45. Extended Warranties and Guarantees

Owner may at its sole discretion extend the one (1) year warranty period up to twenty-four (24) months, in which case Contractor shall maintain the warranties and guarantees. If such extension of the one (1) year warranty period causes an increase in the cost of the warranties and guarantees provided by Contractor, an adjustment in contract price shall be made as provided by the Contract Documents.

46. Arbitration

With the prior approval of the Owner and the Contractor, all claims, disputes and other matters in question arising out of, or relation to, the Contract Documents or the breach thereof, except for claims which have been waived by the making and acceptance of final payment as provided by Item 27 of these General Provisions, may be decided by arbitration in accordance with the Arbitration Rules of the

American Arbitration Association. If entered into, the agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in any court having jurisdiction thereof.

Notice of the request for arbitration shall be filed in writing with the other party to the Contract Documents and with the American Arbitration Association, and a copy shall be filed with the Engineer. The request for arbitration shall set forth specifically the dispute to be arbitrated. Acceptance by the other party of the request to arbitrate shall constitute the agreement to arbitrate and arbitration shall proceed forthwith. No legal proceedings other than to enforce arbitration shall be commenced on any issue covered by the arbitration agreement.

The Contractor shall carry on the work and maintain the progress schedule during any arbitration proceedings, unless otherwise mutually agreed in writing.

47. Taxes

The Contractor shall pay all sales, consumer, use and other similar taxes required by the law of the place where the work is performed.

48. Contractor's Understanding

It is understood and agreed that the Contractor has, by careful examination, satisfied himself as to the nature and extent of the work, the character, quality, and quantity of the materials to be encountered, the character of the equipment and facilities needed preliminary to and during the prosecution of the work, the general and local conditions, and all other matters which can in any way affect the work under this contract. No verbal agreement or conversation with any officer, agent or employee of the Engineer or the Owner, either before or after the execution of this Agreement, shall affect or modify any of the terms or obligations herein contained.

49. Accidents

The Contractor shall provide, at the site, such equipment and medical facilities as are necessary to supply first-aid service to anyone who may be injured in connection with the work. The Contractor must promptly report in writing to the Engineer all accidents whatsoever arising out of, or in connection with the performance of the work, whether on or adjacent to the site which causes death, personal injury, or property damages, giving full details and statements of witnesses. In addition, if death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the Engineer and the Owner. If any claim is made by anyone against the Contractor or any subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the Engineer, giving full details of the claim.

50. Safety and Sanitation

The Contractor shall provide adequate safety and sanitation facilities according to State laws and local ordinances.

The Contractor will assume sole and complete responsibility for job site conditions during the course of construction of the project, including safety of all persons and equipment. This responsibility shall apply continuously and not be limited to normal working hours.

51. Climatic Conditions

The Engineer may order the Contractor to suspend any work that may be subject to damage by climatic conditions. The Contractor may suspend work if climatic conditions are such that the Contractor is unable to work. In such case, the Contractor, within seven days, shall request in writing a change order to extend the contract time.

52. Officials Not To Benefit

No official of the Owner shall receive any benefit that may arise by reason of this contract.

53. Clean-Up

During the progress of the work, the Contractor shall maintain the site and related structures and equipment in a clean, orderly condition and free from unsightly accumulations of rubbish. Upon completion of the work, the Contractor shall remove from the vicinity of the work all plants, buildings, rubbish, unused materials, concrete forms, temporary bridging, and other like material, belonging to him or used under his direction during construction, and in the event of his failure to do so, the same may be removed by the Owner after 10 calendar days notice to the Contractor at the expense of the Contractor, and his surety or sureties shall be liable therefore.

As part of the final clean-up, the Contractor shall dress up and grade the right-of-way to match existing ground surfaces, and shall remove therefrom all weeds and other growth. Where the construction has crossed yards or driveways, they shall be restored to a condition equivalent to the condition existing prior to the construction as determined by the Engineer.

No direct payment will be made to the Contractor for any clean-up work, but all compensation therefore shall be included in the prices bid in the schedule for the various items of work.

54. Notice to Owner

In the event this contract involves digging trenches or excavations that extend deeper than four feet below the surface, the Contractor shall promptly, and before the following conditions are disturbed, notify Owner, in writing, of any:

- A. Material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health 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. Subsurface or latent physical conditions at the site differing from those indicated;
- C. 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.

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

In the event a dispute arises between Owner 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, the Contractor, shall not be excused from any scheduled completion date provided for by the contract, but shall proceed with all work to be performed under the contract. The Contractor shall retain any and all rights provided either by contract or by law which pertain to the resolution of disputes and protests between Contractor and Owner.

55. Payment of Withheld Funds

The Owner shall retain 5% of each payment from Contractor and shall make prompt and regular incremental acceptances of portions, as determined by the Owner, of the agreed upon work, and pay retention to the Contractor based on these acceptances. The Contractor, or subcontractor, shall return all monies withheld in retention from a subcontractor within 30 days after receiving payment for work satisfactorily completed and accepted including incremental acceptances of portions of the contract agreement work by the Owner. Federal law (49CFR26.29) requires that any delay or postponement of payment over 30 days may take place only for good cause and with the Owner's prior written approval. Any violation of this provision shall subject the violating Contractor or subcontractor to the penalties, sanctions and other remedies specified in Section 7108.5 of the Business and Professions Code. These requirements shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the Contractor or subcontractor in the event of a dispute involving late payment or nonpayment by the Contractor, deficient subcontract performance, or noncompliance. When the work is

complete, the Owner will issue a Notice of Completion to the County. The Owner will pay all retention funds to the Contractor thirty-five (35) Days after Notice of Completion has been recorded.

56. Storm Water Pollution Prevention Measures

Storm Water Pollution Prevention Measures shall be performed in accordance with the provisions in Section 13-3, "Storm Water Pollution Prevention Plan," of the Standard Specifications.

A. GENERAL

In compliance with the State and Federal regulations regarding storm water management during construction, the Contractor shall not allow any debris, waste materials or pollutants, originating from the Contractor's operations, to enter the storm drainage system, which leads to contamination of local creeks and ponding basins.

The Contractor shall properly dispose of all wastes and excess materials in a legal manner to the satisfaction of the Owner.

B. SELECTIVE BMPS FOR STORM WATER POLLUTION PREVENTION

As applicable to the project or directed by the Engineer, the Contractor shall implement any or all of the following Best Management Practices (BMPs):

1. Material Handling and Storage

a. Nonhazardous Materials

i. Designated Delivery and Storage Area

The Contractor shall propose areas in the vicinity of or within the project site or within the Contractor's staging site, which are suitable for material delivery and storage. To the maximum extent practicable, these areas shall be away from gutters, catch basins, drainage courses or creeks. The Contractor shall submit the proposed areas to and shall obtain the approval from the Engineer in writing prior to bringing in materials.

ii. Storage of Granular Materials

The Contractor shall store granular materials at least ten feet (10') away from any inlet or curb return and shall prevent the granular materials from entering the storm drain system, drainage courses or creeks. During wet weather or when rain is forecast within 24 hours, the Contractor shall cover granular materials with a tarpaulin and surround the material with sandbags or other approved heavy objects.

b. Hazardous Materials

i. Hazardous materials include, but are not limited to, petroleum products, antifreeze, paints, thinners, solvents, pesticides, herbicides and various other toxic chemicals.

ii. The Contractor shall propose, within the project site or the Contractor's staging site, an area that is suitable for hazardous material delivery and storage. To the maximum extent practicable, the area shall be away from inlets, gutters, drainage courses or creeks. The Contractor shall submit the proposed area to and shall obtain approval from the Engineer in writing prior to bringing in hazardous materials.

iii. The Contractor shall label and store all hazardous materials and hazardous wastes in accordance with secondary containment regulations, the City of Los Banos Hazardous Materials Storage Ordinance and all applicable Merced County, State and Federal laws and

regulations.

iv. The Contractor shall keep all hazardous materials or waste in containers and fully covered to avoid contamination of storm runoff.

v. The Contractor shall keep an accurate, up-to-date inventory, including Materials Safety Data Sheets (MSDSs), of hazardous materials and hazardous wastes stored on-site to assist emergency response personnel in the event of a hazardous material incident.

2. Hazardous Material Usage

a. The Contractor shall follow all local, State and Federal policies, laws and regulations governing the use of hazardous materials.

b. The Contractor shall use only Category III pesticides for pest control. If Category III pesticides are unavailable, have been tried but proven ineffective, or when it is necessary to prevent a pest outbreak that poses an immediate threat to public health or significant economic loss, the City may consider allowing the use of Category II pesticides with a dose of up to LD50 (a dose that kills 50 percent of the targeted pest population in the laboratory) provided that the risk to the applicator and impact to the environment can be justified. Use of Category I pesticides is prohibited.

c. Apply pesticides at the appropriate time to maximize their effectiveness and minimize the likelihood of discharging non-degraded pesticides into storm water system, drainage courses and creeks.

d. Mix only as much material as is necessary for treatment. Calibrate application equipment prior to and during use to ensure desired application rate. Do not mix or load pesticides adjacent to storm drain system, drainage courses or creeks.

e. The Contractor shall not overapply herbicides, pesticides or fertilizers and shall follow the manufacturer's instructions regarding uses, protective equipment, ventilation, flammability and mixing of chemicals. Over-application of a pesticide is a "label violation" subject to an enforcement action by the Merced County Agriculture Department.

f. When rain is forecast within 24 hours or during wet weather, the Contractor shall not apply chemicals in outside areas unless otherwise allowed by the Engineer in writing.

3. Integrated Pest Management Methods

The Contractor shall employ, in place of pesticides, integrated pest management methods including:

- a. No control
- b. Physical or mechanical methods
- c. Least toxic chemicals (insecticidal soaps and oil, etc.)

4. Vehicle and Equipment Cleaning, Maintenance and Fueling

a. Cleaning

The Contractor shall not clean or wash vehicles or equipment on-site or in the streets. If allowed by the Engineer in writing, cleaning and washing shall be performed in a designated and bermed area approved by the Engineer using water only. No soaps, solvents, degreasers, steam cleaning equipment or similar methods are permitted. The Contractor shall not allow wash water to flow into streets, gutters, storm drain system, drainage courses or creeks.

b. Maintenance and Fueling

i. The Contractor shall perform maintenance and fueling of vehicles or equipment in a designated, bermed area or over a drip pan that will prevent waste, leaks or spills from entering streets, gutters, storm drain system, drainage courses or creeks.

ii. The Contractor shall inspect all vehicles and equipment arriving on-site for leaking fluids and shall promptly repair leaking vehicles and equipment. Drip pans shall be used to catch leaks until repairs can be made. Shut-off valves on equipment must be working properly.

5. Spill Prevention and Control

a. If hazardous materials are used on the project, the Contractor shall keep a stockpile of spill clean-up materials, such as rags or absorbents, readily accessible on-site.

b. Above-ground storage tanks and their installations shall comply with City, State and Federal requirements.

c. The Contractor shall immediately contain and prevent spills or leaks from entering storm drain system, drainage courses or creeks and shall properly clean up and dispose of the spills or leaks. The Contractor shall not wash the spills or leaks into streets, gutters, storm drain system, drainage courses or creeks and shall not bury the spills or leaks.

d. In case of a hazardous material spillage, the Contractor shall immediately call 911 and shall handle the spilled material in accordance with the requirements of 6, "Disposal of Hazardous Waste," below.

6. Disposal of Hazardous Waste

a. Unless the Contractor is a licensed hazardous waste handler, the Contractor shall contract with a licensed hazardous waste handler to remove and dispose of hazardous waste materials unless the waste quantities to be transported are below threshold limits for transportation as specified in the State and Federal regulations.

b. The Contractor shall arrange for regular hazardous waste collection to comply with limits for storage of hazardous waste.

c. The Contractor may dispose of dry, empty paint cans, buckets, paintbrushes, rollers, rags and drop cloths in the trash.

d. The Contractor shall dispose of hazardous waste at facilities authorized for treatment, storage and disposal of hazardous waste only.

7. Street Sweeping

At the end of each day or as directed by the Engineer, the Contractor shall sweep roadways of all debris and excess materials attributed to the Contractor's operations.

8. Water Usage

a. The Contractor shall use the least amount of water necessary for dust control and street sweeping operations.

b. The Contractor shall not use water to flush dust and debris down the street in place of street sweeping.

9. Dumpsters and Portable Sanitary Facilities

a. If dumpsters or portable sanitary facilities are used, they shall be

stationed at least ten feet (10') away from storm drain facilities.

b. The Contractor shall arrange for regular waste collection to keep dumpsters and portable sanitary facilities from overflowing and shall regularly inspect these facilities for leaks. If a leak is discovered, the Contractor shall arrange for the repair or replacement of facilities that leak. The Contractor shall not wash the dumpsters or portable sanitary facilities on-site.

10. Earthwork

The Contractor shall maximize the control of erosion and sediment by using the Best Management Practices for erosion and sedimentation control described in the California Storm Water Best Management Practice Handbook—Construction Activity or ABAG Manual of Standards for Erosion and Sediment Control Measures.

11. Dewatering

a. The Contractor shall route water through a control device, such as a sediment trap, sediment basin or Baker tank, to remove settleable solids prior to discharging the water into the storm drain system. Refer to the California Storm Water Management Practice Handbook for these sediment control measures.

b. Approval of the control device shall be obtained in advance from the Engineer.

c. Filtration of the water following the control device may be required on a case-by-case basis.

d. If the Engineer determines that the dewatering operation would not generate an appreciable amount of settleable solids, the control device may be waived.

12. Saw Cutting

a. During saw cutting or grinding operation, use as little water as possible.

b. During saw cutting, the Contractor shall cover or barricade catch basins using filter fabric, straw bales, sandbags or fine gravel dams to keep slurry out of the storm drain system. When protecting a catch basin, the Contractor shall ensure that the entire opening of the catch basin is covered. Refer to California Storm Water Best Management Practice Handbook for these control measures.

c. The Contractor shall shovel, absorb or vacuum saw cut slurry and pick up the waste as the work progresses prior to moving to the next location, as specified elsewhere in these specifications or as directed by the Engineer.

d. If saw cut slurry enters catch basins, the Contractor shall, at the Contractor's cost, clean up the storm drain system immediately.

13. Concrete, Grout and Mortar Related Work

a. Material Handling

i. The Contractor shall avoid mixing excess amounts of fresh concrete or cement mortar on-site.

ii. The Contractor shall store concrete, grout and mortar away from storm drain facilities or drainage courses and shall ensure that these materials do not enter the storm drain system.

b. Washing of Concrete Truck and Tools

- i. The Contractor shall not wash out concrete trucks or equipment into streets, gutters, storm drain system, drainage courses or creeks.
- ii. The Contractor shall perform washing of concrete trucks and tools off-site or in a designated area on-site where the water will flow onto dirt or into a temporary pit in a dirt area. The Contractor shall let the water percolate into the soil and dispose of the hardened concrete in a trash container. If a suitable dirt area is not available, the Contractor shall collect the wash water and dispose of it off-site.

14. Asphalt Concrete Paving

a. Project Site Management

- i. When rain is forecast within 24 hours or during wet weather, the Engineer may prevent the Contractor from paving.
- ii. The Engineer may direct the Contractor to protect drainage courses by using earth dike, straw wattle or sandbag to trap and filter sediment. Refer to California Storm Water Best Management Practice Handbook for these control measures.
- iii. The Contractor shall place drip pans or absorbent material under paving equipment when not in use.
- iv. The Contractor shall cover catch basins and manholes when paving or applying prime coat, tack coat, seal coat, fog seal or slurry seal.
- v. If the paving operation includes an on-site mixing plant, the Contractor shall comply with Merced County NPDES General Industrial Activities Storm Water Permit requirements.
- vi. The Contractor shall preheat, transfer or load hot bituminous material away from storm drain system, drainage courses or creeks.

b. Paving Waste Management

The Contractor shall not sweep or wash down excess sand (placed as part of a sand seal or to absorb excess oil) into streets, gutters, storm drain system or creeks but shall collect the sand and dispose of it off-site. The Contractor shall not wash fresh asphalt concrete pavement.

15. Painting

a. General

- i. The Contractor shall remove as much excess paint as possible from brushes, rollers and other tools before starting cleanup.
- ii. The Contractor shall conduct cleaning of painting equipment and tools in a designated area approved by the Engineer.
- iii. The Contractor shall not allow wash water from cleaning of painting equipment and tools into streets, gutters, storm drain system, drainage courses or creeks.

b. Water-Based Paint

To the maximum extent practicable, the Contractor shall dispose of wash water from water cleaning of brushes, rollers and other tools used in water-based painting work to the sanitary sewer or direct wash water onto dirt area and spade in.

c. Oil-Based Paint

The Contractor shall dispose of waste thinner and solvent and sludge from cleaning of brushes, rollers and other tools used in oil-based painting work as hazardous waste and the Contractor shall handle the waste as described in Section 6, "Disposal of Hazardous Waste," above. To the maximum extent practicable, the Contractor shall filter paint thinner and solvents for reuse.

16. Thermoplastic

a. The Contractor shall transfer and load hot thermoplastic away from drainage systems or drainage courses or creeks.

b. The Contractor shall sweep thermoplastic grindings into plastic bags. Yellow thermoplastic grindings may require special handling as they may contain paint.

C. CONTRACTOR TRAINING AND AWARENESS

1. The Contractor shall train all employees and subcontractors on the storm water pollution prevention requirements contained in these specifications.

2. The Contractor shall inform subcontractors of the storm water pollution prevention contract requirements and include appropriate subcontract provisions to ensure that these requirements are met.

3. The Contractor shall post warning signs in areas treated with chemicals.

D. BMP IMPLEMENTATION

The Contractor shall be responsible throughout the duration of the construction period for installing and maintaining the applicable BMPs and for removing and legally disposing of temporary control measures. Unless otherwise directed by the Engineer or specified elsewhere in these specifications, the Contractor's responsibility for BMP implementation shall continue throughout any temporary suspension of work ordered in conformance with the provisions in Section 8-1.06, "Suspensions," of the Standard Specifications.

Throughout the rainy season, all soil-disturbed areas of the site shall be fully protected with soil stabilization and sediment control device approved by the Engineer at the end of the same day the soil is disturbed unless fair weather is predicted the next day and the protective measures are exempt by the Engineer. The Contractor shall monitor the weather forecast on a daily basis and inform the Engineer of the forecast. The National Weather Service forecast shall be used for this purpose. If precipitation is predicted for the following day, construction schedule shall be altered as required to install appropriate BMPs or to ensure that the already installed BMPs are in good operating condition prior to the onset of rain.

E. BMP MAINTENANCE

To ensure proper implementation and effectiveness of the BMPs, the Contractor shall regularly inspect and maintain the deployed BMPs throughout the construction site. The Contractor shall identify corrective actions and the time needed to address any deficient BMPs or reinstate any BMPs that have been discontinued. The Contractor shall keep written records of all BMP inspections, maintenance and corrective actions.

The frequency of the BMP inspection shall be as follows:

1. Prior to a forecast storm;
2. After any precipitation that causes runoff;
3. At 24-hour intervals during extended rain 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 a BMP, the deficiency shall be corrected immediately. If requested by the Contractor and

approved by the Engineer in writing, the deficiency may be corrected at a later time or date but the corrective action shall not be later than the onset of the subsequent rain event. The correction of deficient BMPs shall be at no additional cost to the City.

F. RESPONSIBILITIES, CONSEQUENCES, AND REMEDIES

1. Conformance with the provisions of this section or other requirements in various other sections of these specifications shall not relieve the Contractor from the Contractor's responsibilities as provided in various relevant articles of Section 7, "Legal Relations and Responsibilities to the Public," of the Standard Specifications, and as specified herein.
2. For purposes of this section, costs and liabilities include, but are not limited to, fines, penalties and damages, whether assessed against the City or the Contractor, including those levied under the Federal Clean Water Act and the State Porter-Cologne Water Act.
3. If solid or liquid materials or waste, hazardous or otherwise, or pollutants originating from the Contractor's operation enter the storm drain system or water courses, the Contractor will be required to thoroughly clean up the affected storm drain facilities and water courses to the satisfaction of the Engineer. If the Contractor fails to clean up the affected facilities as required, the City will issue a stop-work order and take necessary actions to effect the cleanup of the affected facilities.
4. The Contractor shall be responsible for all costs, including fines, the City's cost of defense, the cost of cleanup by others ordered by the City, and liabilities imposed by law as a result of the Contractor's failure or negligence in complying with the requirements specified herein.
5. In accordance with the provisions of Section 7-1.05, "Indemnification," of the standard Specifications if the Contractor fails to accept or reject a tender of defense and indemnity within fifteen (15) calendar days, the City may, in addition to the remedies authorized by law, retain any sum due the Contractor until disposition has been made of all claims or suits for damages or until the Contractor accepts or rejects the tender of defense, whichever occurs first.

G. PAYMENT

Full compensation for storm water pollution control shall be considered as included in the payment for various other items of work and no additional compensation will be made therefore.

Special Provisions

1. Requirements

It is required that there be constructed and completed in accordance with the Contract Documents for "Construction of Oliveira Park Renovations" for the City of Los Banos, all work as described in these Contract Documents.

2. Description of Work

The principal components of the work to be performed under these Contract Documents include the following:

The major work consists of a renovation process to re-establish grading patterns to ensure positive drainage across fields, re-plant lawn playfield areas, install new concrete sidewalks from the parking lot to new entry gates and the installation of concrete mow curbs, and chain link fencing around the soccer play fields. Improvements will also include a new driveway apron on Limestone Boulevard.

Any incidental work not described in the Contract Documents which is necessary to complete the Work shall be furnished and installed as part of this contract at no additional cost to the Owner. The work shall be complete and ready for service to the satisfaction of the Owner. The Contractor shall have had the opportunity to inspect the site and observe actual working conditions during the pre-bid meeting.

The Contractor is responsible to inspect the site and observe actual working conditions prior to bidding the project.

3. Commencement, Prosecution and Completion of Work

The Contractor shall commence work and shall complete all of the work in accordance with the schedule and within the time stated in the bid. The capacity of the Contractor's construction plant, sequence of operations, method of operations, and the forces employed shall at all times during the continuance of the contract, be subject to the approval of the Engineer and shall be such as to ensure the completion of the work within the time specified.

4. Hours of Work

Construction work shall be completed between the hours of 7:00 a.m. and 9:00 p.m. Monday through Friday using normal construction practices. No work shall be performed on Saturday or Sunday. The Contractor may request to the Owner to perform construction outside of these specified hours.

5. Permits and Business Licenses

The Contractor will not need an Encroachment Permit from the Public Works Department prior to start of construction. The Contractor and all subcontractors working within the city limits of Los Banos shall apply for and have issued a business license from the City of Los Banos (209-827-7000) prior to commencement of work.

6. This item intentionally left blank

7. Responsibility Regarding Existing Utilities and Private Property

The existence and location of public and private utilities indicated on the drawings are not guaranteed and any additional utilities and facilities not shown on the drawings shall be investigated and protected by the Contractor. The Contractor shall be held responsible for damage to and for maintenance and protection of existing pipelines, public utilities, drives, curbs and gutters, sidewalks, and fences. Excavation in the vicinity of existing public utility structures, underground electrical or telephone cable, oil or gas pipelines, and waterlines shall be carefully done by hand. The Contractor shall adequately protect all adjoining property and structures from damage, whether within or without of the Owner furnished rights-of-way, and shall be fully responsible for any damage to adjoining property and structures which may result from work

done under this contract. The Contractor shall use extreme care during construction to prevent damage from dust to crops and adjacent property. The Contractor shall sprinkle the areas where the passage of operation of vehicles and equipment creates a dust problem, or take other preventive measures as directed by the Engineer. The Contractor shall furnish all labor, equipment, materials and means required to control dust which is in any way a result of the Contractor's operations.

The Contractor shall be responsible for all damage or injury which may result to any property, outside of the construction right-of-way or within the right-of-way where so noted, from the Contractor's operations hereunder, or otherwise, from the performance of the Agreement by said Contractor or any of his subcontractors or employees.

The Contractor shall attempt to maintain access to the residential and commercial driveways within the construction area at all times during working hours and shall provide access during non-working hours, weekends and holidays.

Payment for all work specified above shall be included in the unit or lump sum prices bid in the schedule for the various items of work.

8. Obstructions

The Contractor shall notify the Engineer and the appropriate regional notification center for operators of subsurface installation at least 3 working days, but not more than 14 calendar days, prior to performing any excavation or other work close to any underground pipeline, conduit, duct, wire or other structure. Failure to contact the notification center prohibits excavation. Regional notification centers include but are not limited to the following:

NOTIFICATION CENTER	TELEPHONE
Underground Service Alert Northern California (USA) www.usanorth811.org	811 or 1-800-227-2600

9. Materials Furnished By Owner

No labor, material, or other facilities shall be provided by the Owner unless otherwise indicated on the drawings or in the Contract Documents.

10. Materials Furnished By Contractor

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation, and other facilities necessary for the execution and completion of the work.

11. Schedule of Values, Material List and Substitutions

Prior to the commencement of work, and within 10 days following the signing of the contract by the Owner and the Contractor, the Contractor shall submit 2 copies of a Schedule of Values for all lump sum bid items in the Bid Schedule and a *complete* list of equipment and materials to be furnished, including all substitutions proposed to the Engineer for approval. Partial or incomplete material lists will not be considered. No substitutions will be considered thereafter. Only one request for substitution will be considered on each item of material or equipment.

12. Request for Extension of Time

All extension of time requests shall be made in writing to the Engineer within seven (7) calendar days from the delay occurrence date. In the case of continuing cause of delay, only one claim is necessary.

13. Rights-of-Way

The Contractor shall not be entitled to extra compensation for hardships and increased cost caused by the

work being adjacent to telephone-telegraph lines and guy wires, power lines and guy wires, buildings, fences, pipelines, ditches, roadways, and other obstacles which may physically restrict or limit the use of construction equipment. In some cases, such physical confinement may necessitate special methods of construction of the work. If the Contractor desires to utilize additional area, he shall obtain the necessary approvals from the landowner. No additional compensation shall be paid to the Contractor for the cost of obtaining additional right-of-way or for the inability to obtain such.

14. Coordination with Other Work

Other work including but not necessarily restricted to relocation of power and telephone poles, installation of a gas line and relocation of water meters may be in progress near or at the construction site at the time the Contractor is in performance of the work specified herein. The Contractor shall coordinate his work with that of others so that prosecution of all work will proceed smoothly.

15. Closure of Streets

When working within the City right-of-way, the Contractor will be allowed to temporarily close the streets being paved to vehicular traffic between the hours 7:00 a.m. and 5:00 p.m. on the day the streets are being paved.

All street closure dates shall be coordinated with and approved by the Engineer for approval no later than 10 working days prior to the earliest proposed closures and detours.

16. Construction Signs, Barricades, Lights and Flagmen

The Contractor shall furnish, erect and maintain adequate barricades, lights, signs and other devices and take other protective measures to prevent damage to the public. The Contractor shall also furnish adequate warning to the public of dangerous conditions to be encountered. Where one lane of a public road is closed, the Contractor shall furnish flagmen at each end of the closed lane to control traffic in the open lane. The Contractor shall also furnish adequate warning to the public of dangerous conditions to be encountered.

Payment for traffic control and other safety measures shall be included in the Traffic Control Plan lump sum price bid in the Bid Schedule.

17. Traffic Control Plan

It is the Contractor's sole responsibility to establish and implement a Traffic Control Plan conforming to Sections 7-1.08, "Public Convenience" 7-1.09, "Public Safety", and Section 12, "Construction Area Traffic Control Devices", of the Caltrans Standard Specifications. Nothing in these Contract Documents shall be construed as relieving the Contractor from his responsibility.

The Traffic Control Plan shall be prepared, stamped and signed by a professional engineer registered in California, and three copies provided to the Engineer before the Contractor is issued a Notice to Proceed.

Payment for the preparation and implementation of the Traffic Control Plan shall be made at the applicable lump sum price bid in the Bid Schedule.

18. Disposal of Waste Materials

Waste material shall be disposed of in accordance with local regulatory requirements. Provide watertight conveyance for liquid, semi-liquid or saturated solids which tend to bleed during transport. Liquid loss from transported materials is not permitted, whether being delivered to construction site or hauled away for disposal. Fluid materials hauled for disposal must be specifically acceptable at selected disposal site.

19. Noise Control

Conduct operations to cause least annoyance to residents in vicinity of work, and comply with applicable local ordinances. Equip compressors, hoists, and other apparatus with mechanical devices necessary to minimize noise and dust. Equip compressors with silencers on intake lines. Equip gasoline or oil-operated equipment with silencers or mufflers on intake and exhaust lines.

20. Water Supply

Water will be available to the Contractor in performance of the work without charge from all Owner fire hydrants. Prior to the use of any hydrant the Contractor shall notify the Owner and obtain and install a meter furnished by the Public Works Department on the fire hydrant. It will be the Contractor's responsibility to convey the water to the work site. Regardless of the method of conveyance chosen, it shall not be cause for closure of any streets nor shall it create a nuisance to nearby residents. An air gap shall be maintained between the hose or pipe discharge to prevent possible backflow in the event of distribution system pressure loss. The Contractor shall pay a One Thousand Dollar (\$1,000) deposit per meter for the use of the fire hydrant meter. The deposit may be refunded in full if the fire hydrant meter is returned undamaged.

21. Notifications

The Owner will notify the Contractor in writing of any non-compliance with the foregoing provisions or of any environmentally objectionable acts and corrective action to be taken. State or local agencies responsible for verification of certain aspects of the environmental protection requirements shall notify the Contractor in writing, through the Owner, of any non-compliance with State or local requirements. The Contractor shall, after receipt of such notice from the Owner or from the regulatory agency through the Owner, immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails or refuses to comply promptly, the Owner may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor unless it is later determined that the Contractor was in compliance.

22. Work Not Listed in Proposal

It is the intent of the plans, specifications and contract documents to provide for the construction of completed and finished facilities and works of improvement unless otherwise specifically provided. Except for authorized changes in the work, payment for said complete and finished facilities and works of improvement will be made only on the basis of the contract items of work listed in the proposal. All other work, including the furnishing of plants, labor, materials, tools, equipment, and incidentals, provided for in the plans, specifications and contract documents, or required for the proper completion of the work as a whole, for which no separate payment has been provided shall be a supplementary obligation of the Contractor and payment therefore shall be considered included in the prices paid for the various contract items of work listed in the proposal.

23. Submittals

The Contractor shall submit to the Engineer, a minimum of six sets, hard copies, or one electronic copy of the following submittals for review and approval:

1. Concrete
2. Concrete Base material
3. Fence Posts
4. Fence Top/Bottom Rail
5. Fence Post Cap
6. Fence Loop Cap
7. Fence Rail End Cups
8. Fence Chain Link Fabric Mesh
9. Fence Tension Bar

10. Fence Banding
11. Fence Truss Rod and Attachment
12. Fence Track Wheel
13. Fence V-Groove Track Wheel
14. Fence V-Groove Track
15. Shop Drawing – Lock Receiver/Insert
16. Irrigation Pipe
17. Irrigation Fittings
18. Irrigation Rotor
19. Soils Fertility Test/Analysis
20. Fertilizers/Soil Amendments
21. Lawn Seed
22. Add Alternate #2 – Vinyl Coated Chain Link Fabric Mesh

Within 10 days after the effective date of the Agreement and before starting to perform any work, the Contractor shall submit to the Engineer for review and approval:

1. A work schedule indicating the times for starting and completing the various stages of the work. No progress payment shall be made to Contractor until an acceptable schedule has been submitted to the Engineer.
2. Traffic Control Plan
3. Notice to Residents in English and Spanish
4. A Schedule of Values - a breakdown of each lump sum price to be used to determine deductive change orders, if necessary.
5. A complete list of equipment and materials to be furnished
6. City of Los Banos Business License for Contractor and all subcontractors

If more than TWO submittals for a single item are required because of incorrect or insufficient data, or the submittal is unacceptable, or because the Contractor wishes to change previously approved material, then all costs incurred by the Owner for the additional review shall be deducted from monies due the Contractor.

A revised work schedule shall be submitted within 5 days of request by the Engineer. No future progress payments shall be made to Contractor until an acceptable schedule has been submitted to Engineer.

24. Bid Item Descriptions

The descriptions below are general descriptions and do not include estimated quantities. See plans and bid summary for estimated quantities. Estimated quantities are provided as a courtesy only. Actual numbers and quantities of symbols on plans prevail.

Bid Item No. 1 – General Conditions (Max 2.5%):

General Conditions will be paid for on a lump sum basis and is limited to 2.5% maximum of the total bid cost. The contract lump sum price paid for General Conditions shall include full compensation for conforming to these requirements, furnishing all the fees, permitting, bonding, labor, and materials for

doing all the work involved in administration and oversight of the project necessary for completion of the work as specified in the General Provisions, these project specifications and as directed by the City.

Bid Item No. 2 – Mobilization/Demobilization (Max 4%):

Mobilization and Demobilization will be paid for on a lump sum basis and is limited to 4% maximum of the total bid cost. The lump sum bid for this item shall include full compensation for conforming to these requirements, temporary fencing, tree protection, labor, materials, tools, equipment, incidentals, and for doing all the work involved in moving on and off the project site necessary for completion of the work.

Payment for 50% of Mobilization and Demobilization or 2% of Total Base Bid, whichever is less, shall be made at the time of the first progress payment after the Contractor has purchased bonds and insurance. The remaining amount shall be made at the time of the final progress payment.

Bid Item No. 3 – Site Preparation:

The lump sum bid for this item shall include all costs for lawn removal, soil clearing, grubbing and temporary erosion and sediment control. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item No. 4 – Demolition and Sawcutting Curb/Gutter:

The lump sum bid for this item shall include all costs for sawcutting, removal of concrete pavements and vertical curbs, curb and gutters, grinding of concrete pavement and other miscellaneous demolition items. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item No. 5 – Site Grading:

The lump sum bid for this item shall include all costs for rough grading, fine grading, soil import and soil removal and disposal. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item No. 6 – Concrete Driveway Apron:

The unit price bid for this item shall include all costs for installation, soil preparation, forming, sub-grade compaction, aggregate base, concrete additives and sealers, pouring concrete pavement, finishing, joints, and joint sealants in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item No. 7 – Concrete Pavement with Base Rock:

The square foot price bid for this item shall include all costs for installation, soil preparation, forming, sub-grade compaction, aggregate base, concrete additives and sealers, pouring concrete pavement, finishing, joints, and joint sealants in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item No. 8 – 9" Concrete Mow Curb at Fence:

The lineal foot price bid for this item shall include all costs for installation, soil preparation, forming, sub-grade compaction, aggregate base, concrete additives and sealers, pouring concrete pavement, finishing, joints, and joint sealants in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item No. 9 – 15" Concrete Mow Curb at 20' Slide Gate:

The lineal foot price bid for this item shall include all costs for installation, soil preparation, forming, sub-

grade compaction, aggregate base, concrete additives and sealers, pouring concrete pavement, finishing, joints, and joint sealants in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form a pay item.

Bid Item No. 10 – Chainlink Fence:

The linear foot price bid for this item shall include all costs for purchase and installation of chainlink fence, forming, excavation, pouring and finishing of concrete footings in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item No. 11 – Chainlink 12' Slide Gate:

The unit bid price bid for this item shall include all costs for purchase and installation of chainlink gate in location shown on Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item No. 12 – Chainlink 20' Slide Gate:

The unit price bid for this item shall include all costs for purchase and installation of chainlink gate in location shown on Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item No. 13 – Irrigation System Adjustments:

The unit price bid for this item shall include all costs for purchase and installation of irrigation pipe, equipment, heads, and all other miscellaneous irrigation components for a fully functioning system as indicated on the Drawings and required in the field. The item also includes labor materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item No. 14 – Soil Amendments/Preparation:

The unit price bid for this item shall include all costs for soil testing, purchase and installation of fertilizers, fertilizer pack, organic material and soil conditioners as indicated by soil laboratory tests, and purchase and installation of amendments as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item No. 15 – Drill Seeding Lawn:

The unit price bid for this item shall include all costs for soil testing, purchase and installation of fertilizers, organic material and soil conditioners, and purchase and installation of seed as indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and specifications which is not specifically set forth in the Bid form as a pay item.

Bid Item No. 16 – Landscape Maintenance:

The lump sum price bid for this item shall include all costs for maintaining installed landscape areas for a period of 120 days as indicated on the Drawings as well as replacements for plants and equipment. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

BID DESCRIPTIONS – ADD ALTERNATE #1

The descriptions below are general descriptions and do not include estimated quantities. See plans and bid summary for estimated quantities. Estimated quantities are provided as a courtesy only. Actual numbers and quantities of symbols on plans prevail.

Bid Item No. 1 – 9” Concrete Mow Curb at Fence:

The lineal foot price bid for this item shall include all costs for installation, soil preparation, forming, sub-grade compaction, aggregate base, concrete additives and sealers, pouring concrete pavement, finishing, joints, and joint sealants in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item No. 2 – 15” Concrete Mow Curb at 20’ Slide Gate:

The lineal foot price bid for this item shall include all costs for installation, soil preparation, forming, sub-grade compaction, aggregate base, concrete additives and sealers, pouring concrete pavement, finishing, joints, and joint sealants in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item No. 3 – Chainlink Fence:

The linear foot price bid for this item shall include all costs for purchase and installation of chainlink fence, forming, excavation, pouring and finishing of concrete footings in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Bid Item No. 4 – Chainlink 20’ Slide Gate:

The unit price bid for this item shall include all costs for purchase and installation of chainlink gate in location shown on Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

BID DESCRIPTIONS – ADD ALTERNATE #2

The descriptions below are general descriptions and do not include estimated quantities. See plans and bid summary for estimated quantities. Estimated quantities are provided as a courtesy only. Actual numbers and quantities of symbols on plans prevail.

Bid Item No. 1 – Black Vinyl Coating on all Chain Link Fabric Mesh (Fence & Gates) and Black Coating on all Posts, Rails, & Fence Components:

The lump sum price bid for this item shall include all costs for purchase and installation of chainlink fence in the areas indicated on the Drawings. The item also includes labor, materials and all other work required by the Drawings and Specifications which is not specifically set forth in the Bid Form as a pay item.

Technical Provisions

SECTION 033000 - 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, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.
- B. Related Requirements:
 - 1. Section 312000 "Earth Moving" for drainage fill under slabs-on-grade.
 - 2. Section 321313 "Concrete Paving" for concrete pavement and walks.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete Subcontractor.
 - e. Special concrete finish Subcontractor.
 - 2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, steel reinforcement installation, and concrete protection.

1.5 ACTION SUBMITTALS

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

- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Indicate amounts of mixing water to be withheld for later addition at Project site, if any.
- C. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
- D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - 1. Location of construction joints is subject to approval of the City.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Welding certificates.
- C. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Form materials and form-release agents.
 - 4. Steel reinforcement and accessories.
 - 5. Curing compounds.
 - 6. Adhesives.
 - 7. Joint-filler strips.
 - 8. Repair materials.
- D. Field quality-control reports.
- E. Minutes of preinstallation conference.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
 - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.

- D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M.
- E. Mockups: Cast concrete slab-on-grade and formed-surface panels to demonstrate typical joints, surface finish, texture, tolerances, floor treatments, and standard of workmanship.
 - 1. Build panel approximately 20sq. ft. for slab-on-grade and 2 ln. ft. for formed surface in the location indicated or, if not indicated, as directed by City.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on concrete mixtures.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

1.10 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- B. Hot-Weather Placement: Comply with ACI 301 and as follows:
 - 1. 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 to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 117.

2.2 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.
 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. High-density overlay, Class 1 or better.
 - b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
 - c. Structural 1, B-B or better; mill oiled and edge sealed.
 - d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
 3. Overlaid Finish birch plywood.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
- D. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- E. Form Ties: Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
1. Furnish units that leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
 2. Furnish ties that, when removed, leave holes no larger than 1 inch in diameter in concrete surface.
 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Epoxy-Coated Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed bars, ASTM A 775/A 775M, epoxy coated, with less than 2 percent damaged coating in each 12-inch bar length.

2.4 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Epoxy-Coated Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, ASTM A 775/A 775M epoxy coated.
- C. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating; compatible with epoxy coating on reinforcement and complying with ASTM A 775/A 775M.
- D. Zinc Repair Material: ASTM A 780/A 780M.
- E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire,

plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
3. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

2.5 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/II,.
 2. Fly Ash: ASTM C 618, Class F.
 3. Slag Cement: ASTM C 989/C 989M, Grade 100 or 120.
 4. Blended Hydraulic Cement: ASTM C 595/C 595M, Type IP, portland-pozzolan cement.
 5. Silica Fume: ASTM C 1240, amorphous silica.
- C. Normal-Weight Aggregates: ASTM C 33/C 33M, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.
 1. Maximum Coarse-Aggregate Size: 1 inch nominal.
 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Lightweight Aggregate: ASTM C 330/C 330M, 1/2-inch nominal maximum aggregate size.
- E. Air-Entraining Admixture: ASTM C 260/C 260M.
- F. 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.
- G. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494/C 494M, Type C.
- H. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.
- I. Water: ASTM C 94/C 94M and potable.

2.6 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. W. R. Meadows, Inc. or approved equal.

2.7 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 according to ASTM D 2240.
- C. Bonding Agent: ASTM C 1059/C 1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.
- D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
 - 1. Types I and II, nonload bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- E. Reglets: Fabricate reglets of not less than 0.022-inch-thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- F. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.8 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
 - 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials:[Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.] [Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:]
 - 1. Fly Ash: 25 percent.
 - 2. Combined Fly Ash and Pozzolan: 25 percent.
 - 3. Slag Cement: 50 percent.

4. Combined Fly Ash or Pozzolan and Slag Cement: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
 5. Silica Fume: 10 percent.
 6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
 7. Combined Fly Ash or Pozzolans, Slag Cement, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
1. Use water-reducing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a w/c ratio below 0.50.
 4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
- E. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

2.9 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings: Normal-weight concrete.
1. Minimum Compressive Strength: 3000 psi at 28 days.
 2. Maximum W/C Ratio: 0.40.
 3. Slump Limit: 4 inches, plus or minus 1 inch.
 4. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
 5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1-inch nominal maximum aggregate size.
- B. Slabs-on-Grade: Normal-weight concrete.
1. Minimum Compressive Strength: 3000 psi at 28 days.
 2. Maximum W/C Ratio: 0.40.
 3. Minimum Cementitious Materials Content: 520 lb/cu. yd.
 4. Slump Limit: 4 inches, plus or minus 1 inch.
 5. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
 6. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1-inch nominal maximum aggregate size.
 7. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

2.10 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.11 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
 - 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.
- 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, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
 - 1. Class A, 1/8 inch for smooth-formed finished surfaces.
 - 2. Class B, 1/4 inch for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Install keyways, reglets, recesses, and the like, for easy removal.
 - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Radius exterior corners and edges of permanently exposed concrete.

- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

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.
 - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
 - 2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
 - 3. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.
 - 1. Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
 - 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material are not acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by City.

3.4 STEEL REINFORCEMENT INSTALLATION

- A. General: 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.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
 - 1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded-wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.
- F. Epoxy-Coated Reinforcement: Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.
- G. Zinc-Coated Reinforcement: Repair cut and damaged zinc coatings with zinc repair material according to ASTM A 780/A 780M. Use galvanized-steel wire ties to fasten zinc-coated steel reinforcement.

3.5 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by City.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
 - 3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 - 4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 - 5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 - 6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 - 7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
 - 1. Tooled Control Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate tool marks on concrete surfaces.
 - 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 does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
 - 2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.
 - 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.6 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by City or City.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Slope surfaces uniformly to drains where required.
 - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

3.7 FINISHING FORMED SURFACES

- A. Smooth Sack Finish: Apply the following to smooth-formed-finished as-cast concrete where indicated:
 - 1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
- B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.8 MISCELLANEOUS CONCRETE ITEM INSTALLATION

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations:
 - 1. Coordinate sizes and locations of concrete bases with actual equipment provided.
 - 2. Construct concrete bases 12 inches high unless otherwise indicated, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated or unless required for seismic anchor support.
 - 3. Minimum Compressive Strength: 3500 psi at 28 days.
 - 4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
 - 5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
 - 6. Prior to pouring concrete, place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 7. Cast anchor-bolt insert into bases. Install anchor bolts to elevations required for proper attachment to supported equipment.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel finish concrete surfaces.

3.9 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss 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.

- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, 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. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.

3.10 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 - 1. Defer joint filling until concrete has aged at least one month. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.11 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by City or City. Remove and replace concrete that cannot be repaired and patched to City's and City's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids

with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar matches surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by City.

D. Perform structural repairs of concrete, subject to City's approval, using epoxy adhesive and patching mortar.

E. Repair materials and installation not specified above may be used, subject to City's approval.

3.12 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

B. Inspections:

1. Steel reinforcement placement.
2. Verification of use of required design mixture.
3. Concrete placement, including conveying and depositing.
4. Curing procedures and maintenance of curing temperature.
5. Verification of concrete strength before removal of shores and forms from beams and slabs.

C. Concrete Tests: Testing 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 one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
2. 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 provides 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.

3. 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.
4. Air Content: ASTM C 231/C 231M, pressure method, for normal-weight concrete;]one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
5. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
6. Unit Weight: ASTM C 567/C 567M, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
7. Compression Test Specimens: ASTM C 31/C 31M.

a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.

- b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.
 8. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
 - a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
 - b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
 9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
 10. Strength of each concrete mixture will be satisfactory if every 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.
 11. Test results shall be reported in writing to City, 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.
 12. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by City but will not be used as sole basis for approval or rejection of concrete.
 13. 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 City. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by City.
 14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- D. Measure floor and slab flatness and levelness according to ASTM E 1155 within 24 hours of finishing.

END OF SECTION

SECTION 311000 - 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.

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; the zone where plant roots grow.
- D. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects larger than 2 inches in diameter; and free of weeds, roots, toxic materials, or other nonsoil materials.
- E. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.
- F. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and [indicated on Drawings] [indicated according to requirements in Section 015639 "Temporary Tree and Plant Protection."] <Insert requirement>.
- G. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 MATERIAL CITYSHIP

- A. Except for materials indicated to be stockpiled or otherwise remain City's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.6 INFORMATIONAL 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. Topsoil stripping and stockpiling program.
- C. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.
- D. Burning: No burning shall be allowed.

1.7 QUALITY ASSURANCE

- A. Topsoil Stripping and Stockpiling Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work. Include dimensioned diagrams for placement and protection of stockpiles.

1.8 FIELD 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 City and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed trafficways if required by City or authorities having jurisdiction.
- B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining City's property will be obtained by City before award of Contract.
 - 1. Do not proceed with work on adjoining property until directed by Architect.
- C. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on City's premises where indicated.
- D. Utility Locator Service: Notify Call Before You Dig (811) for area where Project is located before site clearing.
- E. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.
- F. 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 329113 "Soil Preparation."
 - 1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Verify that trees, shrubs, and other vegetation to remain or to be relocated have been flagged and that protection zones have been identified and enclosed.
- C. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to City.

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.
- B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations.

3.4 EXISTING UTILITIES

- A. City will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.
 - 1. Verify that utilities have been disconnected and capped before proceeding with site clearing.

- B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed.
 - 1. Arrange with utility companies to shut off indicated utilities.
 - 2. City will arrange to shut off indicated utilities when requested by Contractor.
- C. Locate, identify, and disconnect utilities indicated to be abandoned in place.
- D. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by City or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify City not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without City's written permission.

3.5 TOPSOIL STRIPPING

- A. Contractor shall spray all grass area to be renovated with an herbicide to remove all grass and broadleaf weeds.
- B. Remove sod and grass before stripping topsoil.
- C. Strip topsoil to depth of plus or minus 1/2" in a manner to prevent intermingling with underlying subsoil or other waste materials.
 - 1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects larger than 1 inches in diameter; trash, debris, weeds, rocks, roots, and other waste materials.
 - 2. Remove stripping from project site.

3.6 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.
- B. Relocate existing irrigation heads and piping as indicated on Drawings and where necessary in the field.
- C. 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.

3.7 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 City's property.
- B. Burning tree, shrub, and other vegetation waste is not permitted.

- C. 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

SECTION 312000 - EARTH MOVING

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. Excavating and filling for rough grading the Site.
 - 2. Preparing subgrades for pavements.
 - 3. Excavating and backfilling for structures/fencing.
 - 4. Drainage course for concrete slabs-on-grade.
 - 5. Subbase course for concrete pavements.
- B. Related Requirements:
 - 1. Section 033000 "Cast-in-Place Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.
 - 2. Section 311000 "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
 - 3. Section 329200 "Turf and Grasses" for finish grading in planting areas and tree and shrub pit excavation and planting.

1.3 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
 - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Base Course: Aggregate layer placed between the subbase course and pavement or play surfacing.
- C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
- F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
 - 1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by City. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by City. Unauthorized excavation, as well as remedial work directed by City, 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 aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or play surfacing
- J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- K. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct preexcavation conference at Project site.
 1. Review methods and procedures related to earthmoving, including, but not limited to, the following:
 - a. Personnel and equipment needed to make progress and avoid delays.
 - b. Coordination of Work with utility locator service.
 - c. Coordination of Work and equipment movement with the locations of tree- and plant-protection zones.
 - d. Extent of trenching by hand or with air spade.
 - e. Field quality control.
 - f. Tree Protection.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of the following manufactured products required:
 1. Geotextiles.
 2. Controlled low-strength material, including design mixture.
 3. Warning tapes.
- B. Samples for Verification: For the following products, in sizes indicated below:
 1. Geotextile: 12 by 12 inches.
 2. Warning Tape: 12 inches long; of each color.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:
 1. Classification according to ASTM D 2487.
 2. Laboratory compaction curve according to ASTM D 1557.

- C. Preexcavation Photographs: 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.

1.7 QUALITY ASSURANCE

- A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

1.8 FIELD CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from City and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by City or authorities having jurisdiction.
- B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining City's property will be obtained by Owner before award of Contract.
 - 1. Do not proceed with work on adjoining property until directed by City.
- C. Utility Locator Service: Notify "Call Before You Dig" for area where Project is located before beginning earth-moving operations.
- D. Do not commence earth-moving operations until temporary site fencing and erosion and sedimentation control measures specified in Section 311000 "Site Clearing" are in place.
- E. The following practices are prohibited within protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Mechanical equipment excavation or other digging unless otherwise indicated and approved by City.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- F. Do not direct vehicle or equipment exhaust towards protection zones.
- G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

- B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 1 inch in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
 - 1. Liquid Limit: <40.
 - 2. Plasticity Index: <20.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 294/D 2940M 0; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.
- F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
- H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and zero to 5 percent passing a No. 8 sieve.
- I. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and zero to 5 percent passing a No. 4 sieve.
- J. Sand: ASTM C 33/C 33M; fine aggregate.
- K. 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. Survivability: As follows:
 - a. Grab Tensile Strength: 157 lbf; ASTM D 4632.
 - b. Sewn Seam Strength: 142 lbf; ASTM D 4632.
 - c. Tear Strength: 56 lbf; ASTM D 4533.
 - d. Puncture Strength: 56 lbf; ASTM D 4833.

3. Apparent Opening Size: No. 60 sieve, maximum; ASTM D 4751.
 4. Permittivity: 0.5 per second, minimum; ASTM D 4491.
 5. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.
- B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
1. Survivability: Class 2; AASHTO M 288.
 2. Survivability: As follows:
 - a. Grab Tensile Strength: 247 lbf; ASTM D 4632.
 - b. Sewn Seam Strength: 222 lbf; ASTM D 4632.
 - c. Tear Strength: 90 lbf; ASTM D 4533.
 - d. Puncture Strength: 90 lbf; ASTM D 4833.
 3. Apparent Opening Size: No. 60 sieve, maximum; ASTM D 4751.
 4. Permittivity: 0.02 per second, minimum; ASTM D 4491.
 5. 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 wide and 4 mils 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.
- B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils 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 deep; colored as follows:
1. Red: Electric.
 2. Yellow: Gas, oil, steam, and dangerous materials.
 3. Orange: Telephone and other communications.
 4. Blue: Water systems.
 5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth-moving operations.

- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

- A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
 - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
- B. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Landscape Architect. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.
 - 1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; and soil, boulders, and other materials not classified as rock or unauthorized excavation.

3.5 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
 - 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
 - 2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.
- B. Excavations at Edges of Tree- and Plant-Protection Zones:
 - 1. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots.

Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

2. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

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

3.7 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
 1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.
 1. Clearance: As indicated on Drawings.
- C. 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 projecting stones and sharp objects along trench subgrade.
 1. For pipes and conduit less than 6 inches in nominal diameter, 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 or conduit circumference. Fill depressions with tamped sand backfill.
 3. For flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support conduit on an undisturbed subgrade.
 4. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.
- D. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.
 1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.
- E. Trenches in Tree- and Plant-Protection Zones:
 1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
 2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.

3.8 SUBGRADE INSPECTION

- A. Notify City when excavations have reached required subgrade.

- B. If City determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
- D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by City, without additional compensation.

3.9 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by City.
 - 1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by City.

3.10 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.11 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for Record Documents.
 - 3. Testing and inspecting underground utilities.
 - 4. Removing concrete formwork.
 - 5. Removing trash and debris.
 - 6. Removing temporary shoring, bracing, and sheeting.
 - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.12 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- C. Trenches under Footings: Backfill trenches excavated under footings and within 12 inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Section 033000 "Cast-in-Place Concrete."
- D. Backfill voids with satisfactory soil while removing shoring and bracing.
- E. Initial Backfill:

1. Soil Backfill: Place and compact initial backfill of subbase material or satisfactory soil, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.
 - a. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
 2. Controlled Low-Strength Material: Place initial backfill of controlled low-strength material to a height of 12 inches over the pipe or conduit. Coordinate backfilling with utilities testing.
- F. Final Backfill:
1. Soil Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.
 2. Controlled Low-Strength Material: Place final backfill of controlled low-strength material to final subgrade elevation.
- G. Warning Tape: Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.13 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
 1. Under grass and planted areas, use satisfactory soil material.
 2. Under walks and pavements, use satisfactory soil material.
 3. Under steps and ramps, use engineered fill.
 4. Under footings and foundations, use engineered fill.
- C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.14 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.15 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:

1. Under structures, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 95 percent.
3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 85 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at 90 percent.

3.16 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 1. Provide a smooth transition between adjacent existing grades and new grades.
 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:
 1. Turf or Unpaved Areas: Plus or minus 1 inch.
 2. Walks: Plus or minus 1/2 inch.
 3. Pavements: Plus or minus 1/2 inch.
- C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.17 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

- A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:
 1. Place base course material over subbase course under pavement.
 2. Shape subbase course and base course to required crown elevations and cross-slope grades.
 3. Place subbase course and base course 6 inches or less in compacted thickness in a single layer.
 4. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.18 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

- A. Place drainage course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:
 1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
 2. Place drainage course 6 inches or less in compacted thickness in a single layer.
 3. Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
 4. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.19 FIELD QUALITY CONTROL

- A. Special Inspections: City will engage a qualified special inspector to perform the following special inspections:
 - 1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
 - 2. Determine that fill material classification and maximum lift thickness comply with requirements.
 - 3. Determine, during placement and compaction, that in-place density of compacted fill complies with requirements.
- B. Testing Agency: City will engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Landscape Architect.
- E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2937, and ASTM D 6938, as applicable. Tests will be performed at the following locations and frequencies:
 - 1. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 50 feet or less of trench length but no fewer than two tests.
- F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.20 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 Landscape Architect; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.21 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 City's property.

- B. Transport surplus satisfactory soil to designated storage areas on City's property. Stockpile or spread soil as directed by City.
 - 1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off City's property.

END OF SECTION

SECTION 321313 - 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 Concrete Paving Including the Following:
 - 1. Mow Bands
 - 2. Walks.
- B. Related Requirements:
 - 1. Section 033000 "Cast-in-Place Concrete" for general building applications of concrete.
 - 2. Section 321373 "Concrete Paving Joint Sealants" for joint sealants in expansion and contraction joints within concrete paving and in joints between concrete paving and asphalt paving or adjacent construction.

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 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to concrete paving, including but not limited to, the following:
 - a. Concrete mixture design.
 - b. Quality control of concrete materials and concrete paving construction practices.
 - c. Samples.
 - 2. Require representatives of each entity directly concerned with concrete paving to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete paving Subcontractor.
 - e. Manufacturer's representative of stamped concrete paving system used for stamped detectable warnings.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples for Initial Selection: For each type of product, ingredient, or admixture requiring color selection.
- C. 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.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified ready-mix concrete manufacturer.
- B. Material Certificates: For the following, from manufacturer:
 - 1. Cementitious materials.
 - 2. Steel reinforcement and reinforcement accessories.
 - 3. Fiber reinforcement.
 - 4. Admixtures.
 - 5. Curing compounds.
 - 6. Applied finish materials.
 - 7. Bonding agent or epoxy adhesive.
 - 8. Joint fillers.

- C. Material Test Reports: For each of the following:
 - 1. Aggregates

- D. Field quality-control reports.

1.7 SAMPLES:

- A. Contractor shall pour samples for review and approval by the City, samples include:
 - 1. 4' x 4' concrete pavement
 - 2. 4' length of mowband sample

1.8 QUALITY ASSURANCE

- A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").
- B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Build mockups of full-thickness sections of concrete paving to demonstrate typical joints; surface finish, texture, and color; curing; and standard of workmanship.
 - 2. Build mockups of concrete paving in the location and of the size indicated or, if not indicated, build mockups where directed by District and as indicated on Drawings.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Landscape Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified independent testing agency to perform preconstruction testing on concrete paving mixtures.

1.10 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 frozen materials or materials containing ice or snow.
 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.
- 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. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.
- B. Epoxy-Coated, Joint Dowel Bars: ASTM A 775/A 775M; with ASTM A 615/A 615M, Grade 60 plain-steel bars.
- C. Tie Bars: ASTM A 615/A 615M, Grade 60; deformed.
- D. Hook Bolts: ASTM A 307, Grade A, internally and externally threaded. Design hook-bolt joint assembly to hold coupling against paving form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.
- E. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating, compatible with epoxy coating on reinforcement.
- F. Zinc Repair Material: ASTM A 780/A 780M.

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/C 150M, gray portland cement Type I/II.
 - 2. Fly Ash: ASTM C 618, Class C.
 - 3. Slag Cement: ASTM C 989/C 989M, Grade 100 or 120.
 - 4. Blended Hydraulic Cement: ASTM C 595/C 595M, Type IP, portland-pozzolan cement.
- B. Normal-Weight Aggregates: ASTM C 33/C 33M, Class 4S, uniformly graded. Provide aggregates from a single source.
 - 1. Maximum Coarse-Aggregate Size: 1 inch nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Air-Entraining Admixture: ASTM C 260/C 260M.
- D. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 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.
- E. Water: Potable and complying with ASTM C 94/C 94M.

2.5 CURING MATERIALS

- A. Water: Potable.
- B. 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. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.
- C. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- D. 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:
 - 1. Types I and II, nonload bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

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.
 - 2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that comply with or exceed requirements.
- B. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.
- D. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.
 - 1. Use water-reducing admixture in concrete as required for placement and workability.
 - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
- E. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.
- F. Concrete Mixtures: Normal-weight concrete.
 - 1. Compressive Strength (28 Days): 3000 psi.
 - 2. Maximum W/C Ratio at Point of Placement: 0.45.
 - 3. Slump Limit: 4 inches, plus or minus 1 inch.

2.8 CONCRETE MIXING

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

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.
- 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 concrete batches 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 concrete batches 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, mixture type, mixing time, quantity, and amount of water added.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
- B. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.
 1. Completely proof-roll subbase in one direction. Limit vehicle speed to 3 mph.
 2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
 3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch according to requirements in Section 312000 "Earth Moving."
- C. 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.
- D. Epoxy-Coated Reinforcement: Use epoxy-coated steel wire ties to fasten epoxy-coated reinforcement. Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M.
- E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap of adjacent mats.

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. Butt Joints: Use epoxy-bonding adhesive at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 - 4. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.
 - 1. Locate expansion joints at intervals of 20 feet unless otherwise indicated.
 - 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. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows, to match jointing of existing adjacent concrete paving wherever possible:
 - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate grooving-tool marks on concrete surfaces.
 - a. Tolerance: Ensure that grooved joints are within 3 inches either way from centers of dowels.

2. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.
- E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

- A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.
- B. 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. Rfloat surface immediately to uniform granular texture.
 1. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

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.
- E. Curing Methods: Cure concrete by moisture curing as follows:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period, using cover material and waterproof tape.

3.9 PAVING TOLERANCES

- A. Comply with tolerances in ACI 117 and as follows:
 - 1. Elevation: 1/4 inch.
 - 2. Thickness: Plus 3/8 inch, minus 1/4 inch.
 - 3. Surface: Gap below 10-foot-long; unlevelled straightedge not to exceed 1/2 inch.
 - 4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches of tie bar.
 - 5. Lateral Alignment and Spacing of Dowels: 1 inch.
 - 6. Vertical Alignment of Dowels: 1/4 inch.
 - 7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches of dowel.
 - 8. Joint Spacing: 3 inches.
 - 9. Contraction Joint Depth: Plus 1/4 inch, no minus.
 - 10. Joint Width: Plus 1/8 inch, no minus.

3.10 FIELD QUALITY CONTROL

- A. Testing Agency: District will 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 Landscape 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 District 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 District.
- 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.

3.11 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 Landscape Architect.
- B. Drill test cores, where directed by Landscape Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.
- C. 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.

- D. 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

SECTION 323113 - CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Chain-link fences.
2. Swing gates.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
 - a. Fence and gate posts, rails, and fittings.
 - b. Chain-link fabric, reinforcements, and attachments.
 - c. Gates and hardware.

B. Shop Drawings: For each type of fence and gate assembly.

1. Include plans, elevations, sections, details, and attachments to other work.
2. Include accessories, hardware, gate operation, and operational clearances.

C. Samples for Initial Selection: For each type of factory-applied finish.

1.3 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of chain-link fence, and gate.

B. Product Test Reports: For framework strength according to ASTM F 1043, for tests performed by a qualified testing agency.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For gate operators to include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Mockups: Build mockups to set quality standards for fabrication and installation.

1. Build mockup for typical chain-link fence and gate, including accessories.
 - a. Size: 10-foot length of fence.

1.6 FIELD CONDITIONS

- A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

1.7 WARRANTY

- A. Special Warranty: Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.

- 1. Failures include, but are not limited to, the following:
 - a. Failure to comply with performance requirements.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CHAIN-LINK FENCE FABRIC

- A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist according to "CLFMI Product Manual" and requirements indicated below:

- 1. Fabric Height: As indicated on Drawings.
- 2. Steel Wire for Fabric: Wire diameter of Per plans.
- 3. CLFMI limits first option in "Mesh Size" Subparagraph below to residential applications, but other standards do not make this distinction.
 - a. Mesh Size: 2 inches.
 - b. Fabric: Galvanized finish
 - c. Coat selvage ends of metallic coated fabric before the weaving process with manufacturer's standard clear protective coating
- 4. Selvage: Knuckled at both selvages.

- B. Add Alternate 2: All Fabric shall be Vinyl Coated Black

2.2 FENCE FRAMEWORK

- A. Posts and Rails: ASTM F 1043 for framework, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 based on the following:

- 1. Fence Height: As indicated on Drawings.
- 2. Horizontal Framework Members: Top and bottom rails according to ASTM F 1043 and as indicated on the Drawings
- 3. Brace Rails: ASTM F 1043.

- B. Add Alternate 2: All Post and Rails shall be black powder coated.

2.3 TENSION WIRE

- A. General: Type II: Zinc coated (galvanized) by hot-dip process
 - 1. Add Alternate 2: All Tension wires shall be black.

2.4 ROLL GATES

- A. General: ASTM F 900 for gate posts and double swing gate types.
 - 1. Gate Leaf Width: As indicated .
 - 2. Framework Member Sizes and Strength: Based on gate fabric height as indicated.
- B. Pipe and Tubing:
 - 1. Zinc-Coated Steel: ASTM F 1043 and ASTM F 1083; protective coating and finish to match fence framework.
 - 2. Gate Posts: Round tubular steel.
 - 3. Gate Frames and Bracing: Round tubular steel.
- C. Frame Corner Construction: assembled with corner fittings.
- D. Hardware:
 - 1. Hinges: 360-degree inward and outward swing.
 - 2. Latch: Permitting operation from one side of the Gate. As indicated on the Drawings.
 - 3. Lock Box: As indicated on Drawings.
 - 4. Padlock: Provided by City.
- E. Add Alternate 2: All framework shall be black.

2.5 FITTINGS

- A. Provide fittings according to ASTM F 626.
- B. Post Caps: Provide for each post.
 - 1. Provide line post caps with loop to receive tension wire or top rail.
- C. Rail and Brace Ends: For each gate, corner, pull, and end post.
- D. Tension and Brace Bands: Pressed steel.
- E. Tension Bars: Steel, length not less than 2 inches shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.
- F. Truss Rod Assemblies: Steel, hot-dip galvanized after threading rod and turnbuckle or other means of adjustment.
- G. Tie Wires, Clips, and Fasteners: According to ASTM F 626.
 - 1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, according to the following:

- a. Hot-Dip Galvanized Steel: diameter wire; galvanized coating thickness matching coating thickness of chain-link fence fabric.

H. Finish:

- 1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz./sq. ft. of zinc.
- 2. Aluminum: Mill finish.

- I. Add Alternate 2: All fittings shall be black powdercoat.

2.6 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout, recommended in writing by manufacturer, for exterior applications.

2.7 GROUNDING MATERIALS

- A. Connectors and Grounding Rods: Listed and labeled for complying with UL 467.
 - 1. Connectors for Below-Grade Use: Exothermic welded type.
 - 2. Grounding Rods: Copper-clad steel, 5/8 by 96 inches.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.
 - 1. Do not begin installation before final grading is completed unless otherwise permitted by Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.3 CHAIN-LINK FENCE INSTALLATION

- A. Install chain-link fencing according to ASTM F 567 and more stringent requirements specified.
 - 1. Install fencing on established boundary lines inside property line.
- B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- C. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
 - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.

2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
 - a. Exposed Concrete: Extend 2 inches above grade; shape and smooth to shed water.
 - b. Concealed Concrete: Place top of concrete as indicated on Drawings to allow covering with surface material.
- D. Terminal Posts: Install terminal end, corner, and gate posts according to ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of as indicated on Drawings. For runs exceeding 500 feet, space pull posts an equal distance between corner or end posts.
- E. Line Posts: Space line posts uniformly per plans.
- F. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.
 1. Locate horizontal braces at midheight of fabric 72 inches or higher, on fences with top rail, and at two-third fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.
- G. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch-diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches o.c. Install tension wire in locations indicated before stretching fabric. Provide horizontal tension wire at the following locations:
 1. As indicated on Drawings.
- H. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.
- I. Intermediate and Bottom Rails: Secure to posts with fittings.
- J. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 1-inch bottom clearance between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.
- K. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts, with tension bands spaced not more than 15 inches o.c.
- L. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric according to ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.
 1. Maximum Spacing: Tie fabric to line posts at 12 inches o.c. and to braces at 24 inches o.c.
- M. Fasteners: Install nuts for tension bands and carriage bolts on the side of fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

3.4 GATE INSTALLATION

- A. Install gates according to approved shop drawings, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation.

3.5 ADJUSTING

- A. Gates: Adjust gates 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. Lubricate hardware and other moving parts.

3.6 DEMONSTRATION

- A. Contractor to perform operational verification with Owner's maintenance personnel to approve adjust, operate, and maintain chain-link fences and gates. Contractor shall make any necessary adjustments as identified by the City's representative.

END OF SECTION

SECTION 329113 - 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 and layered soil assemblies specified by composition of the mixes.
- B. Related Requirements:
 - 1. Section 311000 "Site Clearing" for topsoil stripping and stockpiling.
 - 2. Section 329200 "Turf and Grasses" for placing planting soil for turf and grasses.

1.3 TESTING

- A. Contractor shall provide preconstruction and field quality-control testing are part of testing and inspecting.

1.4 DEFINITIONS

- A. AAPFCO: Association of American Plant Food Control Officials.
- B. Backfill: The earth used to replace or the act of replacing earth in an excavation. This can be amended or unamended soil as indicated.
- C. CEC: Cation exchange capacity.
- D. 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.
- E. Duff Layer: A surface layer of soil, typical of forested areas, that is composed of mostly decayed leaves, twigs, and detritus.
- F. Imported Soil: Soil that is transported to Project site for use.
- G. Layered Soil Assembly: A designed series of planting soils, layered on each other, that together produce an environment for plant growth.
- H. Manufactured Soil: Soil produced by blending soils, sand, stabilized organic soil amendments, and other materials to produce planting soil.
- I. NAPT: North American Proficiency Testing Program. An SSSA program to assist soil-, plant-, and water-testing laboratories through interlaboratory sample exchanges and statistical evaluation of analytical data.
- J. 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."

- K. 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.
- L. RCRA Metals: Hazardous metals identified by the EPA under the Resource Conservation and Recovery Act.
- M. SSSA: Soil Science Society of America.
- N. 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.
- O. 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.
- P. 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.
- Q. USCC: U.S. Composting Council.

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 and soil amendment and fertilizer before delivery to the site, according to the following:
 - a. Manufacturer's qualified testing agency's certified analysis of standard products.
 - b. Analysis of fertilizers, by a qualified testing agency, made according to AAPFCO methods for testing and labeling and according to AAPFCO's SUIP #25.
 - c. Analysis of nonstandard materials, by a qualified testing agency, made according to SSSA methods, where applicable.
- 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.
- C. Field quality-control reports.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent, state-operated, or university-operated laboratory; 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.
2. Multiple Laboratories: At Contractor's option, work may be divided among qualified testing laboratories specializing in physical testing, chemical testing, and fertility testing.

1.8 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Contractor shall engage a qualified testing agency to perform preconstruction soil analyses on existing, on-site soil and any imported soil.
 1. Notify City two days in advance of the dates and times when laboratory samples will be taken.
- 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 Contractor in presence of City under the direction of the testing agency.
 1. Number and Location of Samples: Minimum of three representative soil samples from varied locations for each soil to be used or amended for landscaping purposes.
 2. Procedures and Depth of Samples: According to USDA-NRCS's "Field Book for Describing and Sampling Soils."
 3. Division of Samples: Split each sample into two, equal parts. Send half to the testing agency and half to City for its records.
 4. 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 by the following methods according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods":
 - a. Sieving Method: Report sand-gradation percentages for very coarse, coarse, medium, fine, and very fine sand; and fragment-gradation (gravel) percentages for fine, medium, and coarse fragments; according to USDA sand and fragment sizes.
 - b. Hydrometer Method: Report percentages of sand, silt, and clay.

2. Total Porosity: Calculate using particle density and bulk density according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
 3. Water Retention: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
 4. Saturated Hydraulic Conductivity: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods"; at 85% compaction according to ASTM D 698 (Standard Proctor).
- C. Fertility Testing: Soil-fertility analysis according to standard laboratory protocol and 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.
- D. Organic-Matter Content: Analysis using loss-by-ignition method according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."
- E. 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. for 6-inchdepth of soil.
 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. for 6-inchdepth of soil.
- 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 specified in this article are guidelines that may need revision 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. Ratio of Loose Compost to Soil: 4 Cubic yards per 1000 sf.
2. Weight of Lime: As recommended by testing agency.
3. Weight of Sulfur or Iron Sulfate: As recommended by testing agency.
4. Weight of Agricultural Gypsum: As recommended by testing agency.
5. Weight of Commercial Fertilizer: As recommended by testing agency.
6. Weight of Slow-Release Fertilizer: As recommended by testing agency.
7. Unacceptable Properties: Clean soil of 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 imported soil.
 - c. Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding 1 inch 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.
 3. Form: Provide lime in form of ground dolomitic limestone.

- 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/C 33M.

2.3 ORGANIC SOIL AMENDMENTS

- A. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
- B. Organic Matter Content: 40-50 percent of dry weight. Retain "Sphagnum Peat" or "Muck Peat" Paragraph below, or both, if required; sphagnum peat is an acidic peat; muck peat has a neutral pH.
- C. Wood Derivatives: Shredded and composted, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.
 - 1. Partially Decomposed Wood Derivatives: In lieu of shredded and composted wood derivatives, mix shredded and partially decomposed wood derivatives with ammonium nitrate at a minimum rate of 0.15 lb/cu. ft. of loose sawdust or ground bark, or with ammonium sulfate at a minimum rate of 0.25 lb/cu. ft. of loose sawdust or ground bark.

2.4 FERTILIZERS

- A. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
- 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.
 - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified testing agency.
- 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.

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

PART 3 - EXECUTION

3.1 GENERAL

- A. Place planting soil and fertilizers according to requirements by the soil laboratory.
- 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 frozen, muddy, or excessively wet.
- B. Preparation: Till unamended, existing soil in planting areas to a minimum depth of 6 to 12 inches. Remove stones larger than 1 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off City'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 78 to 85 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 FIELD QUALITY CONTROL

- A. Testing Agency: City shall review soil at completion of finish grading. Contractor shall turn irrigation on at end of grading to ensure that no puddling occurs.
- B. City shall review at end of 20 minute irrigation cycle for each zone and review for puddles.
- C. Contractor shall fill in any depressions that are observed prior to seeding.
- D. Perform the following tests and inspections:
 1. Compaction: Test planting-soil compaction after placing each lift and at completion using a densitometer or soil-compaction meter calibrated to a reference test value based on laboratory testing according to ASTM D 698. Space tests at no less than one for each 2500 sq. ft. of in-place soil or part thereof.
 2. Flooding: City shall review soil at completion of finish grading. Contractor shall turn irrigation on at end of grading to ensure that no puddling occurs.
 - a. Each irrigation zone shall run for a 20 minute cycle. City shall review at end of cycle.

- b. Contractor shall fill in any depressions that are observed prior to seeding
 - E. Soil will be considered defective if it does not pass tests and inspections.
 - F. Prepare test and inspection reports.
- 3.4 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 overcompacted, 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.
- 3.5 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 City's property unless otherwise indicated.
 - 1. Dispose of excess subsoil and unsuitable materials on-site where directed by City.

END OF SECTION

SECTION 329200 - 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. Seeding.

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.
- B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
 - 1. Certification of each seed mixture for turfgrass. Include identification of source and name and telephone number of supplier.
- C. Product Certificates: For fertilizers, from manufacturer.

- D. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Recommended procedures to be established by City for maintenance of turf during a calendar year. Submit before expiration of required maintenance periods.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful turf establishment.
 - 1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
 - 2. Experience: Five years' experience in turf installation.
 - 3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
 - 4. Personnel Certifications: Installer's field supervisor shall have certification in one of the following categories from the Professional Landcare Network:
 - a. Landscape Industry Certified Technician - Exterior.
 - b. Landscape Industry Certified Lawncare Manager.
 - c. Landscape Industry Certified Lawncare Technician.
 - 5. Pesticide Applicator: State licensed, commercial.

1.8 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. 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.

1.9 FIELD CONDITIONS

- A. Planting Restrictions: Coordinate planting periods with initial maintenance periods to provide required maintenance from date of Substantial Completion.
- 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.

1.10 FINAL ACCEPTANCE AND WARRANTY PERIOD

- A. The City shall accept each area upon completion of specified work.
- B. It shall be the right of the City to inspect work for compliance to the specifications and advise the contractor, in writing, of any work that is found to deviate from the Drawings or these specifications.
- C. Warranty Period shall be 90 days after the acceptance date, and the turf shall be acceptable when:
 - 1. The healthy active turf provides at least 95% coverage with no bare area greater than 18 inches in diameter.
 - 2. The turf has received at least three mowings.
 - 3. The grass cover is essentially free of weeds.

PART 2 - PRODUCTS

2.1 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances.
- B. Seed Species:
 - 1. Quality: All seed shall be in conformance with the California State Seed Law of the Department of Agriculture. Each seed bag shall be delivered to the site sealed and clearly marked as to species, purity, percent germination, dealer's guarantee, and dates of test. Prior to seeding at the request of the owner, the contractor shall provide a letter of certification, original Association of Official Seed Analysts (AOSA) seed test results.
 - 2. Mix: As Indicated on the Drawings

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: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.
- B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 - 1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

2.3 MULCHES

- A. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: 40-50 percent of dry weight.
 - B. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic and free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.
 - C. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.
- 2.4 PESTICIDES
- A. 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.
 - B. 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.
 - C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.
- 2.5 EROSION-CONTROL MATERIALS
- A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.
 - B. Erosion-Control Fiber Mesh: Biodegradable burlap or spun-coir mesh, a minimum of 0.92 lb/sq. yd., with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches long.
 - C. Erosion-Control Mats: Cellular, nonbiodegradable slope-stabilization mats designed to isolate and contain small areas of soil over steeply sloped surface, of 4-inch nominal mat thickness. Include manufacturer's recommended anchorage system for slope conditions.

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; mow bands; and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
 - 1. Protect adjacent and adjoining areas from drill seeding overspray.
 - 2. 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."
- 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 City's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 DRILL SEEDING

- A. Drill seed with seeding machine. Do not broadcast or drop seed .
 - 1. Evenly distribute seed by sowing equal quantities in two directions
 - 2. Broadcast fertilizer.
 - 3. The seed shall be uniformly distributed with a turfgrass drill seeder, such as a Brillon or approved equal. The areas shall be drilled from two directions with at least a 45 degree difference in angle approach.
 - 4. After seeding, all areas shall be cultipacked to a minimum of 85% compaction.
 - 5. Contractor shall reseed as necessary to ensure a 95% coverage.
- B. Sow seed at a total rate of 10 lbs/1000 sq. ft..
- C. Apply a nitrogen based fertilizer, 15-15-15 at a rate of 10 lbs/1000 sq.ft..
- D. After seeding, all areas shall be cultipacked to a minimum of 85% compaction.
- E. Protect seeded areas from hot, dry weather or drying winds by applying peat mulch within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly to a thickness of 3/16 inch], and roll surface smooth.
- F. 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 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.
 2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
 3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.
- B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and 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.
 2. Water turf with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.
- 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 bermudagrass (Tifway II) to a height of 1/2 to 1 inch.
- D. Turf Postfertilization: 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.

3.6 SATISFACTORY TURF

- A. Turf installations shall meet the following criteria as determined by Architect:
1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 95 percent over any 10 sq. ft. and bare spots not exceeding 6 by 6 inches.
 2. Satisfactory Drill Seeded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, 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.

3.7 PESTICIDE APPLICATION

- A. 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 City's operations and others in proximity to the Work. Notify City before each application is performed.

- B. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.8 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 City'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.

3.9 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. Drill Seeded Turf: 90 days from date of Substantial Completion.
 - a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

END OF SECTION

