COMPLETE BIDDING AND CONTRACTING MANUAL

For The:

WILLOW CREEK COMMUNITY SERVICE DISTRICT
BRANNAN MOUNTAIN TANK PROJECT

WILLOW CREEK, HUMBOLDT COUNTY, CALIFORNIA

Owner:
WILLOW CREEK COMMUNITY SERVICE DISTRICT
135 WILLOW ROAD
WILLOW CREEK, CA 95537-0008

PREPARED BY:
TRINITY VALLEY CONSULTING ENGINEERS, INC
67 WALNUT WAY
POST OFFICE BOX 1567
WILLOW CREEK, CA 95573
(530) 629-3000

APRIL 2025

WILLOW CREEK COMMUNITY SERVICE DISTRICT
BRANNAN MOUNTAIN TANK PROJECT
WILLOW CREEK, HUMBOLDT COUNTY, CALIFORNIA

WILLOW CREEK COMMUNITY SERVICE DISTRICT
135 WILLOW ROAD
POST OFFICE BOX 8
WILLOW CREEK, CA 95537

TRINITY VALLEY CONSULTING ENGINEERS, INC
67 WALNUT WAY
POST OFFICE BOX 1567
WILLOW CREEK, CA 95573
(530) 629-3000

RECOMMENDED BY:

ERIC KEYES, P.E. 5/5/2025 **DATE**
C 90533 Expires 12/31/25

ACCEPTED BY:

SUSAN O'GORMAN, GENERAL MANAGER 5/5/2025 **DATE**
WILLOW CREEK COMMUNITY SERVICE DISTRICT

TABLE OF CONTENTS

Division 40: Process Integration

409123 Level Control

Divisions 41-48

Not used

Forms

Not used

Attachments

01. Plan Set
02. Mitigation Monitoring, and Reporting Program
03. Soils Report

DIVISION 00
PROCUREMENT & CONTRACTING REQUIREMENTS

SECTION 001100
ADVERTISEMENT FOR BIDS

The Willow Creek Community Service District (WCCSD) will be accepting bids from responsive, responsible, qualified, and licensed Contractors for the *BRANNAN MOUNTAIN WATER TANK PROJECT*.

BIDDING AND CONTRACTING MANUALS
Electronic Bidding and Contracting Manuals are available upon request from Trinity Valley Consulting Engineers by calling 530.629.3000 or emailing tvce@tvce.biz. Bidding and Contracting Manuals can also be viewed and downloaded from the Humboldt or Shasta Builder's Exchanges. A non-reimbursable fee of $100.00 will be charged for all requested printed copies of official Bidding and Contracting Manual.

MANDATORY PREBID CONFERENCE
A non-mandatory Pre-bid Conference and site visit will be held at the Willow Creek Community Service District located at 135 Willow Road, Willow Creek, California, on May 14, 2025 at 10:00 a.m. PDT.

BID DEADLINE
Complete Bid Packages will be accepted electronically, US Postal Service or hand delivered submittal, until May 23, 2025 at 2:00 p.m. PDT, at the Willow Creek Community Service District located at 135 Willow Road, Willow Creek, CA 95573.
Bids received after this time will NOT be accepted or considered.

CONSTRUCTION TIMEFRAME
The allocated timeframe for completion of work is one-hundred eighty (180) calendar days starting on the date to be designated under the Notice to Proceed.

PREVAILING WAGE
Prevailing wage rates will apply. Current Prevailing Wage Rates can be obtained from the CA Department of Industrial Relations (http://www.dir.ca.gov/dirdatabases.html)

Davis Bacon rates can obtain the current minimum prevailing wage rates at www.wdol.gov.

The higher of the two rates will apply for this project.

CONTRACTOR REQUIREMENTS
All Contractors bidding this project must have either a Class A or B License that corresponds to the appropriate work being performed on the project. Contractors are required to provide a Data Universal Numbering System (DUNS) & Bradsteet Number. Contractors are also required to be registered with the Central Contractor's Registration at http://www.ccr.gov/ and the Department of Industrial Relations (DIR) for public works projects at http://www.dir.ca.gov/Public-Works/Contractors.html

RESERVE
The WCCSD reserves the right to reject any and all bids and to waive any informalities or irregularities in the bid proposal process. Further, that right is reserved to select Project Bids separately. For more information please contact:

Willow Creek Community Service District
Attn: Susan O'Gorman, General Manger
Post Office Box 8
Willow Creek, CA 95573
P: (530) 629-2136
susan@willowcreekcsd.com

Trinity Valley Consulting Engineers
Attn: Eric Keyes
2200 Main Street
Weaverville, CA 96093
P: (530) 623-4446
eric@tvce.biz

END OF SECTION 001100

SECTON 002100
INSTRUCTIONS TO BIDDERS

BID SUBMITTALS AND CONDITIONS

Complete Bid Packages may be delivered by electronic submittal, hand or mailed delivered, to the following address:

Willow Creek Community Service District
135 Willow Road/ Post Office Box 8
Willow Creek, CA 95573
susan@willowcreekcsd.com

If electronic mailing or US Postal Service, please call 530.629.2136 to verify that we have received your bid. Please allow sufficient time for your bids to arrive, late deliveries will not be accepted:

Bids will be accepted until May 23, 2025 at 2:00 p.m. PDT at which time the sealed bids will be publicly opened and read aloud to all attending. Additionally, participants are being provided a ZOOM meeting ID so they may participate remotely.
ZOOM Meeting ID: 414 162 5718 (https://zoom.us/j/4141625718)

The following documents constitute a complete bid and are required to be submitted to form a responsive bid:

1. 004000 Bid Form
2. 004100 Bid Schedule
3. 004300 Bid Security
4. 004336 Subcontractor Schedule
5. 004500 Bidder Qualifications
6. 004519 Non-Collusive Affidavit

Each bid must be submitted in a sealed envelope, addressed:

Willow Creek Community Service District
135 Willow Road
Willow Creek, CA 95573-0008

The sealed envelope containing the bid must be plainly marked on the outside as:

Bid for the:
BRANNAN MOUNTAIN WATER TANK PROJECT

The envelope should also bear on the outside the name of the bidder, his address, and his license number.

If submitted electronically, Subject Line should state: BID FOR BRANNAN MOUNTAIN WATER TANK PROJECT. Please call to verify receipt of bid.

If forwarded by mail or electronically, the bid must be received by the date and time of opening. Any bids received after the time and date of opening resulting from untimely delay due to the mail system or other methods of conveyance will not be considered.

Bids received prior to the time of opening will be securely kept, unopened. The official who is to open the bids will decide when the specified time has arrived, and no bid received thereafter will be considered. No responsibility will attach to office personnel for the premature opening of a bid not properly addressed and identified. Telegraphic bids or modifications will not be considered.

Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof.

All bids must be made on the provided bid form and schedule. All blank spaces for bid prices must be filled in, in ink or typewritten, and the bid form must be fully completed and executed when submitted. A conditional or qualified bid will not be accepted. Each signature page must bear an original signature, whether within or separate from this document.

Bidders shall have a current California Contractors License appropriate for the nature of work to be performed. Bona fide bidders (Licensed and Bonded in accordance with current California State Contractor's Law) shall have a State of California Class A & B Contractor's License, or have a combination of both licenses including the license(s) of subcontractors. Bidder must have at least a Class A license allowing for a subcontractor to fulfill the Class A license requirement. All Subcontractors shall be properly licensed for the services they will be providing.

After bids have been submitted, the bidder shall not assert that there was a misunderstanding concerning the quantities of work or of the nature of the work to be done. No bidder may withdraw a bid within fourteen (14) calendar 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 successful bidder.

BID REVIEW AND AWARD

The Owner may waive any informalities or minor defects or reject any and all bids.

BIDDING INFORMATION

The Owner shall provide to bidders prior to bidding:

1. An electronic package containing the bid and contract documents necessary to construct the project.
2. All information which is pertinent to, and delineates and describes the land owned and rights of way acquired or to be acquired.
3. A pre-bid site visit is mandatory. Bids will be accepted only from parties who have attended the pre bid site visit.

The contract documents contain the provisions required for the construction of the project. Information obtained from an officer, agent, or employee of the Owner or any other person shall not affect the risks or obligations assumed by the Contractor or relieve him from fulfilling any of the conditions of the contract.

Bidders must satisfy themselves as to the accuracy of the estimated quantities in the Bid Schedule (if any) by examining the site and reviewing the drawings and specifications including addenda (if applicable). The failure or omission to do this shall in no way relieve any bidders from any obligation in respect to his bid.

Requests for clarification must be in writing, addressed to the Owner, and received at least seven working days prior to the bid opening date. Owner provided clarifications and supplemental instructions will be issued as addenda to the specifications and provided to all Plan Holders no later than four working days prior to the bid opening date.

QUESTIONNAIRE AND FINANCIAL STATEMENT FORM

Bidders must fill out, sign and submit this form as part of the proposal. Bidders must also, if required, present additional satisfactory evidence that they are fully prepared with the necessary experience, capital, machinery and materials to furnish the articles called for and to conduct the work as required by the drawings and specifications.

NON-COLLUSIVE AFFIDAVIT

Each person submitting a bid for any portion of the work contemplated by the bidding documents shall execute an affidavit, in the form provided by the Owner, to the effect that he has not colluded with any other person, firm or corporation in regard to any bid submitted. Such affidavit shall be attached to the bid and be considered a part of the complete bid packet.

BONDING REQUIREMENTS

Bid, Performance, and Payment bonds will be required for this project.

Bid bonds totaling no less than five percent (5%) of the total bid and payable to the Owner shall accompany any bid. A cashier's check may be used in lieu of a bid bond. As soon as the bid prices have been compared, the Owner will return the bonds of all except the three lowest responsible bidders. When the Agreement is executed, the bonds of the two remaining unsuccessful bidders will be returned. The bid bond of the successful bidder will be retained until the Payment and Performance bonds have been executed and approved, after which it will be returned.

Performance and Payment bonds, each totaling 100% of the Contract price, with a corporate surety approved by the Owner, shall be provided to the Owner when the Agreement is executed.

Attorneys-in-fact who sign Bid, Payment, and Performance bonds must file with each bond a certified and effective dated copy of their power of attorney.

The Owner may make such investigations, as they deem necessary to determine the ability of the bidder to perform the work. Bidders shall be prepared to furnish such information and data for this purpose at the Owner's request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the Agreement and to complete the work contemplated therein.

The successful bidder will be required to execute an Agreement and obtain the Performance and Payment bond, if required, within ten calendar days from the date when the Notice of Award is delivered to the bidder. In case of failure of the bidder to execute the Agreement, the Owner may at their option consider the bidder in default, in which case any bid bond accompanying the proposal shall become the property of the Owner.

The Owner, within fourteen calendar days of receipt of the Agreement and any required Performance and Payment bonds signed by the party to whom the Agreement 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 provide a written notice of withdraw of his signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the Owner.

NOTICE TO PROCEED

The Owner will issue the Notice to Proceed within fourteen calendar days after the Agreement is fully executed. Should there be reasons why the Notice to Proceed cannot be issued within such period; the time may be extended by mutual agreement between the Owner and Contractor. If the Notice to Proceed has not been issued within the acceptable period or within the period mutually agreed upon, the Contractor may terminate the Agreement without further liability on the part of either party.

OTHER REQUIREMENTS

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.

The successful bidder shall abide by the requirements under Executive Order No. 11246, as amended, including specifically the provisions of the equal opportunity clause set forth in the General Conditions.

The successful bidder will be required to supply the names and addresses of major material suppliers and subcontractors to the Owner as part of their bid and within fourteen calendar days of receipt of the Notice to Proceed (supplemental to the Schedule of Subcontractors provided with bid). In the event that major suppliers or subcontractors differ from those provided during bidding the Contractor will be required to provide a fully executed subcontractor release in strict conformance to the California Subletting and Subcontracting Fair Practices Act Public Code Section 4100-4113.

The successful bidder shall supply submittals information in accordance with the submittals section of the contract documents.

END OF SECTION 002100

SECTION 002500
PRE-BID MEETING

PART 1 GENERAL

1.1 Description

A. The Pre-bid Conference is a formal meeting held and hosted by the Owner, technical support personnel, and the Project Manager to officially convey the vital aspects of the project, bidding process and requirements, and to field the inquiries of potential bidders. In addition to covering the key aspects of the construction project and the bidding formalities prospective bidders will also have an opportunity to visit the project site.

B. Attendance of prospective bidders at the pre-bid meeting is **not** mandatory.

C. The pre-bid meeting is scheduled for: 10:00 am May 14, 2025.

D. The pre-bid conference will be held at 135 Willow Road, Willow Creek, CA 95573 with a site visit to follow.

PART 2 PRODUCTS

2.1 Documentation

A. Contractors attending the pre-bid conference will be provided a formal Agenda and minutes following the meeting. Contractors will be required to sign an official Sign-In Sheet to document attendance.

PART 3 EXECUTION (NOT USED)

END OF SECTION 002500

SECTION 004000
BID FORM

Proposal of _____

(hereinafter called "Bidder"), organized and existing under the laws of the State of California, doing business as _____
(a corporation, a partnership, an individual, etc.)

to the **Willow Creek Community Service District** (hereinafter called "Owner").

In compliance with the Advertisement for Bids, Bidder hereby proposes to perform all work for the completion of the project as described under Section 011000 and all other appurtenant items in strict accordance with the Contract Documents, within the time set forth therein, and at the prices stated in the Bid Schedule included herein.

By submission of this Bid**,** the Bidder certifies, and in the case of a joint Bid each party thereto certifies as to Bidder's organization, that this BID has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this Bid with any other Bidder or with any competitor.

Bidder hereby agrees to commence work under this contract on or before a date to be specified in the Notice to Proceed and to fully complete the project within the allocated timeframe**.** Bidder further agrees to pay as liquidated damages, the sum of **$2500.00** per calendar day for every day beyond the agreed upon date of completion as provided in the General Provisions (Time for Completion and Liquidated Damages section).

Bidder acknowledges receipt of the following Addendum(s):

_____
_____
_____
_____

Bid Amount:

_____USD
Written Amount

$_____
Numeric Amount

Bidder agrees to perform all the work described in the Contract Documents for the unit prices or lump sum stated in the Bid Schedule.

Bid Respectfully Submitted:

Date

Bidder

Address

License No. Expiration Date

Print Name Title

Signature

SEAL – (if BID is by a corporation)

004100
BID SCHEDULE

Base Bid					
Bid Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Item Total**
000000-01	General Conditions / County Permits	LS	1		
015000-01	Temporary Facilities	LS	1		
017100-01	Mobilization/Demobilization	LS	1		
033000-01	650,000-gal Tank Foundation System	LS	1		
099600-01	Coating / Painting	LS	1		
221200-01	650,000-gal Welded Steel Water Tank	LS	1		
311100-01	Clearing and Grubbing	LS	1		
312200-01	Site Grading	LS	1		
312500-01	Erosion Control	LS	1		
321100-01	Class II Aggregate Base Rock – Access Rd	Ton	50		
321100-02	1” Rock - Upper Site	Ton	70		
321100-03	Rock Dissipation	Ton	25		
323113-01	Chain Link Fencing and Gates	LF	275		
323234-01	Gabion Faced MSE Retaining Wall	LS	1		
331100-01	8” C906 (HDPE) Waterline	LF	535		
331100-02	Miscellaneous Piping / Valving / Joints	LS	1		
331216-01	Altitude Control Valve	LS	1		
334000-01	Caltrans D73 Area Drain	LS	1		
334000-02	12” CMP Culvert Pipe	LF	50		
				Base Bid Grand Total:	

Bid Alternate					
Bid Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Item Total**
033000-01	409,000-gal Tank Foundation System	LS	1		
221200-01	409,000-gal Welded Steel Water Tank	LS	1		
				Alternate Total:	

<<SEE NEXT PAGE>>

Award of the contract will be based on the lowest responsive and responsible bid. The base bid will be the primary basis of evaluation. If the base bid total is within the available project budget, the award will be made to the lowest responsive bidder based solely on the base bid. However, if the base bid exceeds the project budget, the Owner reserves the right to consider the bid alternate. In that case, the alternate bid item prices will be substituted for the corresponding base bid items as identified in the bid schedule, and award will be made to the lowest responsive bidder based on the aggregate total of the modified bid. This approach ensures the project remains within budget while preserving fair and competitive bidding.

End of Section

SECTION 004300
BID SECURITY

PART 1 GENERAL

1.1 Description

A. The Bid Guarantee provided by the Contractor is a submittal with the Bid affirming that the Contractor has the financial capability to undertake the proposed project.

B. Bid Security for this project shall be provided in one of the acceptable forms listed under Part 2 below and shall be for the amount of **ten percent (10%)** of the total Bid.

PART 2 PRODUCTS

2.1 Bid Security Types

a. Bank Certified Check
b. Bank Draft
c. US Government Bond
d. Surety Bid Bond

PART 3 EXECUTION

3.1 Surety Bid Bond

A. For Surety Bid Bonds a form has been included in this Section to be filled out by the Contractor and provided with the Bid.

BID BOND FORM

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned,

_____ as Principal, and

_____ as Surety, are hereby held and firmly bound unto the **Willow Creek Community Service District**, as Owner in the penal sum of _____for payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assignees.

Signed, this_____ day of _____ , 20_____.

The Condition of the above obligation is such that whereas the Principal has submitted to the Owner a certain BID, attached hereto and hereby made a part hereof to enter into a contract in writing, for the completion of the **Brannan Mountain Water Tank Project** as described under Section 011000 of the Contract Documents and all other appurtenant items in strict accordance with the contract documents, within the time set forth therein, and at the prices stated in the Bid Schedule.

NOW, THEREFORE,

(a) If said BID shall be rejected, or

(b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the form attached hereto (properly completed in accordance with said BID) and shall furnish a BOND for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID, then this obligation, shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____

Principal

BY: _____ (Seal)

_____

Surety

BY: _____ (Seal)

IMPORTANT - Surety companies executing BONDS must be authorized to transact business in the state of California.

SECTION 004336
(Submit with Bid)
SUBCONTRACTOR SCHEDULE

Provided in strict accordance with the Miller Act, Prompt Payment Act, Small Business Act, and California Subletting and Subcontracting Fair Practices Act Public Code Section 4100-4113

The undersigned bidder certifies that he has used the bids of the following subcontractors in making up his bid and that the subcontractors listed will be used for the work on which they bid.

Item or Portion of Work to be done by Subcontractor	Subcontractor's Name under which Licensed	Location Place of Business

(If Space is Insufficient for listing all Subcontractors please attach additional sheets)

The foregoing is submitted by the bidder in accordance with the acts listed above, and the bidder, if awarded the contract, agrees to fully and promptly comply with such Acts including payment to subcontractors for "satisfactory" performance within seven days of government payment receipt. Bidder certifies and warrants that all subcontractors listed above are, and when performing their subcontracts will be, dully licensed by the State of California to perform the work or services to be done by the subcontractor.

Name of Bidder: _____

Authorized Signature by: _____

Title of Signer: _____

SECTION 004500
BIDDER QUALIFICATIONS

Name: _____

SSN or EIN: _____

D.B.A.: _____

Street address: _____

City: _____ Telephone: _____

State License Number: _____ Type: _____

Bank References: _____

_____

_____

List three most recent construction jobs by name and address:

_____

_____

_____

How long in business? _____ How many employees? _____

Are you an equal opportunity employer? _____

Are you eligible to perform state or federal government work? _____

Name and address of insurance carrier:

_____

_____

Conflict of Interest:
Are you or any member of your family related to any employee of the Owner or member of the governing board of the Owner?

No:_____ Yes: _____ If yes, please explain relationship:

_____

_____

_____ Date: _____
Signature of License Holder

_____ Date: _____
Signature of Company Representative (if different)

SECTION 004519
NON-COLLUSIVE AFFIDAVIT

State of _____

County of _____

_____,
being first duly sworn, deposes and says:

That he is, _____
the party making the foregoing proposal for bid, that such proposal or bid is genuine and not collusive or sham; that said bidder has no colluded, conspired, connived or agreed, directly or indirectly, with any bidder or person, to put in a sham bid or to refrain from bidding, and has not, in any manner, directly or indirectly, sought by agreement or collusion, or communication or conference, with any person, to fix the bid price of affiant or of any other bidder, or to fix any overhead, profit or cost element of said bid price, or of that of any other bidder, or to secure any advantage against the Owner or any person interested in the proposed contract, and that all statements in said proposal for bid are true.

Project Name: BRANNAN MOUNTAIN WATER TANK PROJECT

Location: WILLOW CREEK, CALIFORNIA

_____
(**Signature shall be notarized**)

_____
(Name and title)

_____
(Date)

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

Subscribed and Sworn (or affirmed) to before me on this _____ day of _____, 20___ by _____ proved to me on the basis of satisfactory evidence to be the person who appeared before me.

_____
Seal Signature of Notary

SECTION 005100
LETTER OF INTENT TO AWARD
[EXAMPLE]

[Contractor Name and Address]

The WILLOW CREEK COMMUNITY SERVICE DISTRICT (WCCSD) conducted a formal Request for Bids for the BRANNAN MOUNTAIN WATER TANK PROJECT, in Willow Creek, California. Proposals were received by the WCCSD until _____ PM (PDT) on _____. Proposals are a matter of public information.

We are pleased to inform you that your proposal in the amount of _____ and a total construction time of _____ Calendar Days has been selected by the WCCSD. Please prepare and submit by _____ the necessary documentation noted below and contained within the WCCSD Contract Documents so that we may prepare the Construction Contract and issue a Notice to Proceed to you:

1. Construction Contract Security
2. Certificate of Insurances
3. Required Submittals (at this time) of Products proposed for use on the Project
4. Schedule of Amounts for Contract Payment and Construction Schedule

If you have any questions or need additional information, please feel free to contact the WCCSD at (530) 6299-2137.

Sincerely,

SECTION 005200
CONSTRUCTION CONTRACT
[Example]

WILLOW CREEK COMMUNITER SERVICE DISTRICT
BRANNAN MOUNTAIN WATER TANK PROJECT
CONSTRUCTION CONTRACT

This Contract made this _____ day of _____, 20____ by and between _____ (hereinafter called the "Contractor") and the Willow Creek Community Service District (hereinafter called "Owner").

The Contractor and the Owner agree as follows:

Scope of Work:
The Contractor shall furnish all labor, materials, equipment, supervision, services, and other pertinent components and perform and complete all work required for the Branna Mountain Water Tank Project in the town of Willow Creek, County of Humboldt, State of California as described in length in Section 011000 of the Contract Document.

Agreed Contract Price:
The Owner shall pay the Contractor for performance of the Contract, subject to any additions or deductions thereto, as provided in the Contract Documents.

Sum of: [write out dollar amount here] dollars ($_____).

Contract Documents:
The Contract shall include all the documents included in the Complete Proposal Booklet provided for the project.

All of the parts together form the Contract. In the event that any provision of any part of this Contract conflicts with any provision part, the provision of the part first enumerated in this section shall govern, except as otherwise specifically stated. The various provisions in Addenda shall be construed in the order of preference of the part of the Contract which each modifies.

Construction Contract Security:
The Contractor agrees to provide the Owner with a Construction Contract Security in accordance with Section 006100 within ten (10) working days after signing this Contract.

Wage Rates:
Application of the current State Prevailing Wage Rates, Obtained from the CA Department of Industrial Relations (http://www.dir.ca.gov/dirdatabases.html)

Completion Date:
The Contractor agrees to complete the Project to the Owner's satisfaction within one hundred eighty (180) calendar days starting as indicated in the Notice to Proceed. Liquidated Damages will be enforced at **$2500.00** for each consecutive calendar day beyond the contract completion date as provided in the General Provisions (Time for Completion and Liquidated Damages section).

Insurance:
The Contractor shall furnish evidence within ten (10) working days after signing this Contract of the following insurance coverage as required by Section 35 of the General Conditions:

1. General Liability
2. Automobile Liability Insurance
3. Workmen's Compensation Insurance
4. Builder's Risk Insurance

IN WITNESS WHEREOF, the parties hereto caused this instrument to be executed in _____, County of _____, State of California, as of the day and year written below.

CONTRACTOR

License #: _____

By: _____

Title: _____

Date: _____

Business Address:

_____

_____

_____

OWNER

By: _____

Title: _____

Date: _____

Business Address:

_____

_____

_____

SECTION 005500
NOTICE TO PROCEED
[Example]

Dated: _____

Project: Brannan Mountain Water Tank Project
Owner: Willow Creek Community Service District
Owner's Contract Number: _____
Engineer's Project Number: 209.19
Contractor: _____
Contractor's Address: _____
_____
_____
_____

You are notified that the Contract times under the above contract are as follows:

Contract Start Date (on or Before) _____

Contract Time (Calendar Days) _____

Substantial Completion By _____

Days to Substantial Completion _____

Readiness for Final Payment By _____

Calendar Days to Readiness for Final Payment _____

Willow Creek Community Service District
Owner (please print or type)

_____ _____
Owner Signature Date

CC: Copy to Engineer

SECTION 006100
CONTRACT SECURITY

SECTION 1 GENERAL

1.1 Section Includes

A. The Construction Contract Security provided by the Contractor is a financial guarantee that the project will be satisfactorily completed at the cost of the bid amount to the Owner.

1.2 Submittals

A. A Contract Security will be required to be submitted to the Owner in concert with ratification of the Contract Agreement.

1.3 Measurement and Payment

A. Payment for the Construction Contract Security shall be included in each item of the Bid Schedule as it applies.

SECTION 2 PRODUCTS

2.1 Construction Contract Security Types

A. Contract Security must be provided at a minimum of 100% of the total amount of the contract including all costs itemized per section 004100 and the cost of the security, if not also itemized per section 004100. The following four (4) types of contract security may be used to meet the construction guarantee for this project:

a. Performance Bond
b. Payment Bond
c. Irrevocable Letter of Credit
d. Cash Escrow

SECTION 3 EXECUTION

3.1 Sample forms have been provided under this section for convenience.

PERFORMANCE BOND FORM

KNOW ALL MEN BY THESE PRESENTS: that

_____
(Name and Address of Contractor)

a _____, hereinafter called Principal, and _____
(Corporation Partnership or Individual) (Name and Address of Surety)

_____

hereinafter called Surety, are held and firmly bound unto the WILLOW CREEK COMMUNITY SERVICE DISTRICT, hereinafter called Owner, in the penal sum of

_____

$ _____, being one-hundred percent (100%) of the contract amount in lawful money of the United States, for the payment of which sum will and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a contract with the Owner, dated the _____ day of _____, 20___, a copy of which is hereto attached and made a part hereof for the completion of the

_____

including the work as described under Section 011000 of the Contract Manual, and all other appurtenant items in strict accordance with the contract documents, within the time set forth therein, and at the prices stated in the Bid Schedule.

NOW THEREFORE, if the Principal shall, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the OWNER, with or without notice to the Surety and during the one year guaranty period, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED FURTHER, that the said Surety for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the WORK to be performed there under or the TECHNICAL SPECIFICATIONS accompanying the same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the TECHNICAL SPECIFICATIONS.

PROVIDED FURTHER, that no final settlement between the OWNER and the Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts one of which shall be deemed an original, this the _____ day of _____, 20___.

_____ (SEAL)
(Name of Principal)

BY: _____
(Signature for Principal)

_____
(Address)

ATTEST: _____
(Principal Secretary)

WITNESS: _____
(Witness as to Principal)

_____
(Address)

BY: _____ (SEAL)
(Attorney-in-Fact)

_____
(Address)

ATTEST: _____
(Surety Secretary)

WITNESS: _____
(Witness as to Principal)

_____
(Address)

NOTE: Date of BOND must not be prior to date of Contract. If Principal is Partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must be authorized to transact business in the State where the PROJECT is located.

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: that

_____
(Name and Address of Contractor)

a _____, hereinafter called Principal, and _____
(Corporation Partnership or Individual) (Name and Address of Surety)

_____

hereinafter called Surety, are held and firmly bound unto the WILLOW CREEK COMMUNITY SERVICE DISTRICT, hereinafter called Owner, in the penal sum of $ _____ representing one-hundred percent (100%) of the contract amount, in lawful money of the United States, for the payment of which sum will and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the _____day of _____ 20___, a copy of which is hereto attached and made a part hereof for the completion of the _____ _____ including the work as described under Section 011000 of the Contract Documents, and all other appurtenant items in strict accordance with the contract documents, within the time set forth therein, and at the prices stated in the Bid Schedule.

NOW THEREFORE, if the Principal shall promptly make payment to all persons, firms, SUBCONTRACTORS, and corporations furnishing materials for or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such WORK, and all insurance premiums on said WORK, and for all labor, performed in such WORK whether by SUBCONTRACTOR or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED FURTHER, that the said Surety for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the WORK to be performed there under or the TECHNICAL SPECIFICATIONS accompanying the same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the TECHNICAL SPECIFICATIONS.

PROVIDED FURTHER, that no final settlement between the OWNER and the Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____ counterpart one of which shall be deemed an original, this the _____ day of _____, 20___.

_____ (SEAL)
(Name of Principle)

BY: _____
(Signature for Principal)

_____
(Address)

ATTEST: _____
(Principal Secretary)

WITNESS: _____
(Witness as to Principal)

_____
(Address)

BY: _____ (SEAL)
(Attorney-in-Fact)

_____
(Address)

ATTEST: _____
(Surety Secretary)

WITNESS: _____
(Witness as to Principal)

_____
(Address)

NOTE: Date of BOND must not be prior to date of Contract. If Principal is a Partnership, all partners should execute the BOND.

IMPORTANT: Surety companies executing BONDS must be authorized to transact business in the State where the PROJECT is located.

SECTION 007200
GENERAL CONDITIONS

General Conditions Table of Contents

1.0 DEFINITIONS

1.1 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:

1.2 Addenda - Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the contract documents, drawings and technical provisions, by additions, deletions, clarifications or corrections.

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

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

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

1.6 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.

1.7 Contract Documents - The contract, including Advertisement For Bids, Information For Bidders, Bid, Bid Bond, Agreement, General Provisions, Labor Provisions, Special Provisions, Payment Bond, Performance Bond, Notice of Award, Notice to Proceed, Change Order, Drawings, Technical Specifications, Submittal Requirements, and Addenda.

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

1.9 Contract Time - The number of calendar days stated in the Contract Documents for the completion of the work.

1.10 Contract Manager - The person with the owner organization who is authorized to administer the contract for the Owner.

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

1.12 Contract Manager Representative - The representative of the Contract Manager authorized to deal with the Contractor at the site to administer the technical aspects of the Contract and to assure compliance with the Drawings and Specifications.

1.13 Drawings - The part of the contract documents which show the characteristics and scope of the work to be performed.

1.14 Engineer – The person, firm or corporation named as such in the contract documents.

1.15 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 Owner or Contract Manager to the Contractor during construction.

1.16 Notice Of Award - The written notice of the acceptance of the bid from the Owner to the successful Bidder.

1.17 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.

1.18 Owner – **Willow Creek Community Service District.**

1.19 Plans - The part of the contract documents which show the characteristics and scope of the work to be performed and which have been prepared or approved by the Contract Manager. In as far as these contract documents are concerned; the terms Drawings and Plans are synonymous.

1.20 Project - The undertaking to be performed as provided in the contract documents.

1.21 Shop Drawings - All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the Contractor, a subcontractor, manufacturer, supplier or distributor, which illustrate how specific portions of the work shall be fabricated or installed.

1.22 Specifications - A part of the contract documents consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship. In as far as these contract documents are concerned; the terms Technical Provisions and Specifications are synonymous.

1.23 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.

1.24 Substantial Completion - That date as certified by the Contract Manager when the construction of the project 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.

1.25 Special Provisions - Modifications and additions to General Conditions which may be required by a federal agency for participation in the project, or such requirements that may be imposed by applicable state or local laws, or the Owner's contracting practices.

1.26 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.

1.27 Technical Specifications - A part of the contract documents consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship. In as far as the contract documents are concerned, the terms Technical Specifications and Technical Provisions are synonymous.

1.28 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.

1.29 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.

2.0 ADDITIONAL INSTRUCTIONS, DETAIL DRAWINGS ORDER OF PRECEDENCE

2.1 The Contractor may be furnished additional instructions and detail drawings, by the Contract Manager as necessary to carry out the work required by the contract documents.

2.2 The additional drawings and instruction 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.

2.3 In the event of an inconsistency between provisions of this contract, the inconsistency shall be resolved by giving precedence in the order given in the Special Provisions section of these documents.

3.0 REPORTS AND RECORDS

3.1 The Contractor shall submit to the Contract Manager such schedule of quantities and costs, payrolls, reports, estimates, records and other data where applicable as are required by the contract documents for the work to be performed.

3.2 The Contractor shall keep all records related to the contract for a minimum of three years after acceptance of the completed work.

4.0 DRAWINGS AND TECHNICAL SPECIFICATIONS

4.1 The intent of the drawings and technical provisions is that the Contractor shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the work in accordance with the contract documents and all incidental work necessary to complete the project in an acceptable manner, ready for use, occupancy or operation by the Owner.

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

4.3 Any discrepancies found between the drawings and technical specifications and site conditions or any inconsistencies or ambiguities in the drawings or technical specifications shall be immediately reported to the Contract Manager, 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.

5.0 SITE INVESTIGATION AND CONDITIONS

5.1 The Contractor will take steps necessary to ascertain the nature and location of the work, and investigate the general and local conditions which can affect the work or its cost, including but not limited to:

5.2 Conditions bearing upon transportation, disposal, handling, and storage of materials;

5.3 The availability of labor, water, electric power, and roads;

5.4 Uncertainties of weather, river stages, tides, or similar physical conditions at the site;

5.5 The conformation and conditions of the ground; and

5.6 The character of equipment and facilities needed preliminary to and during work performance. The Contractor also will observe and determine the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Owner, as well as from the drawings and technical specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the Owner.

5.7 The Owner assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the Owner. The Owner does not assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its representatives before the execution of this contract, unless that understanding or representation is expressly stated in this contract.

6.0 SHOP DRAWINGS

6.1 The Contractor shall provide shop drawings as may be necessary for the prosecution of the work as required by the contract documents. The Contract Manager will have the drawings promptly reviewed and will recommend approval or disapproval of all shop drawings. Approval of any shop drawing shall not release the Contractor from responsibility for deviations from the contract documents. The approval of any shop drawing which substantially deviates from the requirement of the contract documents shall be evidenced by a change order.

6.2 When submitted for review and approval, shop drawings shall bear the Contractor's certification that he has reviewed, checked and approved the shop drawings and that they are in conformance with the requirements of the contract documents.

6.3 Portions of the work requiring a shop drawing or sample submission shall not begin until the shop drawing or submission has been approved by the Contract Manager. A copy of each approved shop drawing and each approved sample shall be kept in good order by the Contractor at the site and shall be available to the Owner.

7.0 MATERIALS, SERVICES AND FACILITIES

7.1 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, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the work within the specified time.

7.2 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.

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

7.4 Materials, supplies and equipment shall be in accordance with samples submitted by the Contractor and approved by the Contract Manager.

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

7.6 The Contractor shall promptly remove from the premises all materials rejected by the Contract Manager for failure to comply with the contract documents. The Contractor shall promptly replace the materials with acceptable materials without expense to the Owner.

8.0 SUBSTITUTIONS

8.1 Whenever a material, article or piece of equipment is identified on the drawings or technical specifications by reference to brand name or catalogue number, it shall be understood that this is referenced for the purpose of defining the performance or 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 Contract Manager, such material, article, or piece of equipment is of equal substance and function to that specified, the Contract Manager may approve its substitution and use by the Contractor. Any cost differential shall be deductible from the contract price and the contract documents shall be appropriately modified by change order. 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.

9.0 PATENTS

9.1 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. However, 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 Contract Manager.

10.0 SURVEYS, PERMITS, REGULATIONS

10.1 The Owner shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the work together with a suitable number of bench marks adjacent to the work as shown in the contract documents.

10.2 The Contractor shall carefully preserve bench marks, 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.

10.3 Permits and licenses of a temporary nature necessary for the prosecution of the work shall be secured and paid for by the Contractor unless otherwise specified in the contract documents. 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 Contract Manager in writing, and any necessary changes shall be adjusted as provided in Section 31 -"Changes in the Work".

11.0 LAWS AND REGULATIONS AFFECTING WORK

11.1 The Contractor shall at all times observe and comply with Federal, State, and County laws, ordinances and regulations which in any manner affect the conduct of the work; and all such orders and decrees as exist at the present and which may be enacted later by legislative bodies or tribunals having legal jurisdiction or authority over the work. No pleas of misunderstanding or ignorance thereof will be considered. The Contractor shall be wholly responsible for any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree.

12.0 PROTECTION OF WORK, PROPERTY, AND PERSONS

12.1 The Contractor will 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 will 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.

13.0 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS

13.1 The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work sites which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall remove trees only when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound.

13.2 The Contractor shall protect from damage all existing improvements and utilities:

13.3 At or near the work site, and

13.4 On adjacent property of a third party, the locations of which are made known to or should be known by the Contractor.

13.5 The existence and location of utilities are not guaranteed by the Owner and shall be investigated and verified in the field by the Contractor before commencing construction activities in any particular area. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contract Manager may have the necessary work performed and charge the cost to the Contractor.

14.0 OPERATIONS AND STORAGE AREAS

14.1 The Contractor shall confine all operations (including storage of materials) to areas authorized or approved by the Contract Manager. The Contractor shall hold and save the Owner and its representatives free and harmless from liability of any nature occasioned by the Contractor's performance.

14.2 Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contract Manager and shall be built with labor and

materials furnished by the Contractor without expense to the Owner. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. Only with the written consent of the Contract Manager may the buildings and utilities be abandoned and not removed.

14.3 The Contractor shall use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contract Manager. In such case, the Contractor shall minimize disruption and delays to traffic in the affected areas. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

15.0 INSURANCE

15.1 The Contractor shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the Contractor's execution of the work, whether such execution be by himself or by any subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

15.1.1 Claims under workmen's compensation, disability benefit and other similar employee benefit acts;

15.1.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;

15.1.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;

15.1.4 Claims for damages insured by usual personal injury liability coverage which are sustained

15.1.4.1 by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or

15.1.4.2 by any other person; and

15.1.5 Claims for damages because of injury to or destruction of tangible property, including loss of use resulting there from.

15.2 Certificates of Insurance acceptable to the Contract Manager shall be filed with the Contract Manager prior to commencement of the work. These Certificates shall contain a provision that coverage’s afforded under the policies will not be canceled unless at least fifteen (15) days prior written notice has been given to the Contract Manager.

15.3 The Contractor shall procure and maintain, at his own expense, during the contract time, liability insurance as hereinafter specified;

15.3.1 Contractor's General Public Liability and Property Damage Insurance including vehicle coverage issued to the Contractor and protecting him from all claims for personal injury, including death, and all claims for destruction of or damage to any property, arising out of or in connection with any operations under the contract documents, whether such operations be by himself or by any subcontractor under him, or anyone directly or indirectly employed by the Contractor or by a subcontractor under him. Insurance shall be written with a limit of liability of not less than $1.000,000 for all damages arising out of bodily injury, including death, at any time resulting there from, sustained by any one person in any one accident; and a limit of liability of not less than $2,000,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than $500,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than $1,000,000 aggregate for any such damage sustained by two or more persons in any one accident.

15.4 The Contractor shall procure and maintain, at his own expense, during the contract time, in accordance with the provisions of the laws of the state in which the work is performed, Workmen's Compensation Insurance, including occupational disease provisions, for all of his employees at the site of the project and in case any work is sublet, the Contractor shall require such subcontractor similarly to provide Workmen's Compensation Insurance, including occupational disease provisions for all of the latter's employees unless such employees are covered by the protection afforded by the Contractor. In case any class of employees engaged in hazardous work under this contract at the site of the project is not protected under Workmen's Compensation statute, the Contractor shall provide, and shall cause each subcontractor to provide, adequate and suitable insurance for the protection of his employees not otherwise protected.

15.5 The Contractor shall secure, if applicable, "All Risk" type Builder's Risk Insurance for work to be performed. Unless specifically authorized by the Contract Manager, the amount of such insurance shall not be less than the contract price totaled in the bid. The policy shall cover not less than the losses due to fire, explosion, hail, lightning, vandalism, malicious mischief, wind, collapse, riot, aircraft, and smoke during the contract time, and until the work is accepted by the Contract Manager. The policy shall name as the insured the Contractor and the Owner.

16.0 INDEMNIFICATION

16.1 The Contractor will indemnify and hold harmless the Owner, his agents and employees from and against all claims, damages, losses and expenses including attorney's fees arising out of or resulting from the performance of the work, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting there from; and is caused in whole or in part by any negligent or willful act or omission of the

Contractor, and subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

16.2 In any and all claims against the Owner or any of his agents, or employees by any employee of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any subcontractor under workmen's compensation acts, disability benefit acts or other employee benefits acts.

16.3 The obligation of the Contractor under this paragraph shall not extend to the liability of the Owner, his agents, or employees arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or technical specifications.

18.0 ACCIDENT PREVENTION AND SAFETY PROGRAM

18.1 The Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons, including employees, and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours. Safety provisions shall conform to U.S. Department of Labor (OSHA), and all other applicable federal, state, county, and local laws, ordinances, codes, the requirements set forth below, and any regulations that may be detailed in other parts of these documents. Where any of these are in conflict, the more stringent requirement shall be followed. The Contractor's failure to thoroughly familiarize himself with the aforementioned safety provisions shall not relieve him from compliance with the obligations and penalties set forth herein.

18.2 The Contract Manager will notify the Contractor of any observed non-compliance with the foregoing provisions and the action to be taken. The Contractor shall, upon receipt of such notice, immediately take corrective action. If the Contractor fails or refuses to comply promptly, the Contract Manager 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 claims for extension of time, or for excess costs or damages by the Contractor.

18.3 The Contractor shall develop and maintain for the duration of this contract, a safety program that will effectively incorporate and implement all required safety provisions. The Contractor shall appoint an employee who is qualified and authorized to supervise and enforce compliance with the safety program.

18.4 The Contractor as a part of his safety program, shall maintain at his office or other well-known place at the job site, safety equipment applicable to the work as prescribed by the aforementioned authorities, all articles necessary for giving first aid to the injured, and shall establish the procedure for the immediate removal to a hospital or a doctor's care of persons who may be injured on the job site.

18.5 If death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to the Contract Manager. In addition, the Contractor must promptly report in writing to appropriate authorities and the Contract Manager's representative all accidents whatsoever arising out of, or in connection with, the performance of the work whether on, or adjacent to, the site, giving full details and statements of witnesses. If a 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 Contract Manager giving full details of the claim.

18.6 The Contractor shall provide, erect, and maintain all necessary barricades, suitable and sufficient lights, danger signals, signs and other traffic control devices, and shall take all necessary precautions for the protection of the work and safety of the public. Highways closed to traffic shall be protected by effective barricades, and obstructions shall be illuminated during the hours of darkness. Suitable warning signs shall be provided to control and direct traffic properly. The Contractor shall erect warning signs in advance of any place on the project where operations may interfere with the use of the road by traffic, and at all intermediate points where the new work crosses or coincides with an existing road.

18.7 Compliance with the requirements of this provision by subcontractors will be the responsibility of the Contractor.

19.0 TEMPORARY SANITARY FACILITIES

19.1 The Contractor shall provide and maintain necessary sanitary conveniences for the use of those employed on or about the work properly secluded from public observation in such a manner and at such points as shall be approved by the Contract Manager and their use shall be strictly enforced.

20.0 SUPERVISION BY CONTRACTOR

20.1 The Contractor will supervise and direct the work. He will be solely responsible for the means, methods, techniques, sequences and procedures of construction. The Contractor will 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 have full authority to act on behalf of the Contractor and all communications given to the supervisor shall be as binding as if given to the Contractor. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the work.

21.0 SUBCONTRACTING

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

21.2 The Contractor shall not award work to subcontractor(s) in excess of 67% of the contract price, without prior written approval of the Contract Manager.

21.3 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 for the acts and omissions of persons directly employed by him.

21.4 The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the contract document insofar as applicable to the work of subcontractors and to give the Contractor the same power as regards terminating any subcontract that the Contract Manager may exercise over the Contractor under any provision of the contract documents.

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

22.0 SEPARATE CONTRACTS

22.1 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 depends upon the work of any other Contractor, the Contractor shall inspect and promptly report to the Contract Manager any defects in such work that render it unsuitable for such proper execution and results.

22.2 The Owner may perform additional work related to the project by him, or he may let other contracts containing provisions similar to these. The Contractor will afford the other 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.

22.3 If the performance of additional work by other Contractors or the Owner is not noted in the contract documents prior to the execution of the contract, 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 additional work by the Owner or others involves him in additional expense or entitles him to an extension of the contract time, he may make a claim therefore as provided in Sections 31 and 32.

23.0 DAYS OF WORK, HOURS OF WORK

23.1 Regular work shifts shall be eight hours daily Monday through Friday, except on holidays indicated below. Time of beginning and ending the day's work shall be approved by the Contract Manager. The Contract Manager, when in his opinion it is justified, may grant the

Contractor permission to work overtime upon written request by the Contractor. When for good reason short periods of overtime work are required, the Contract Manager may give approval without advance written notice.

23.2 Construction work will not be permitted on Saturdays, Sundays, nor on New Year's Day, Martin Luther King's Day, President's Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day and Christmas Day, nor any other holidays declared by the federal government. When any of the above holidays falls on Saturday and the preceding Friday is established as a holiday or when any of the holidays fall on Sunday and the following Monday is established as a holiday, no construction will be permitted on those days. The Contract Manager, when in his opinion it is justified, may grant the Contractor permission to work on any of the above days upon written application by the Contractor. Approval shall be required at least 48 hours in advance.

24.0 TIME FOR COMPLETION AND LIQUIDATED DAMAGES

24.1 The time for completion of the work is an essential condition of the contract documents. The time for completion appears in the Agreement. The work embraced shall be commenced on a date specified in the notice to proceed.

24.2 The Contractor will proceed with the work at such rate of progress to insure full completion within the time for completion. It is expressly understood and agreed, by and between the Contractor and the Owner, that time for completion of the work under the contract is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the work.

24.3 If the Contractor shall fail to complete the work within the time for completion, or extension of time granted by the Contract Manager, then the Contractor will pay to the Owner the amount for liquidated damages as specified in the contract documents for each calendar day that the work shall be incomplete after the date established by the time for completion. Liquidated Damages for this contract shall be five-hundred dollars ($500.00) US Currency per calendar day.

24.4 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 Contract Manager.

24.4.1 To any preference, priority or allocation order duly issued by the Contract Manager.

24.4.2 To unforeseeable causes 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 abnormal and unforeseeable weather; and

24.4.3 To any delays of subcontractors occasioned by any of the causes specified in paragraphs 25.4.1 and 25.4.2 of this article.

25.0 PROGRESS SCHEDULES AND REQUIREMENTS FOR COMPLIANCE

25.1 The Contractor shall, within ten days of receipt of notice to proceed, submit to the Contract Manager for approval a practicable schedule, showing the order in which the Contractor proposes to carry on the work, the dates on which he will start the major items of work (including procurement of materials, plant and equipment) and the contemplated dates for completing the same.

25.2 If, in the opinion of the Contract Manager, the Contractor falls behind the progress schedule, the Contractor shall take such steps as may be necessary to assure performance within the allowable time for completion. The Contractor may propose for approval by the Contract Manager measures such as increasing number of workers, number of shifts, or overtime operations, days of work, or the amount of construction plant, or all of them. The Contract Manager may require the Contractor to submit for approval such supplementary schedule or schedules necessary to demonstrate that the work shall be performed within the allowable time for completion, all without additional cost to the Owner.

25.3 Failure of the Contractor to comply with the requirements of this provision shall be grounds for determination that the Contractor is not prosecuting the work with such diligence as will insure completion within the specified time for completion. Upon such determination the Contract Manager may terminate the Contractor's right to proceed with the work, or any separable part thereof in accordance with Section 28 entitled "Suspension of Work, Termination and Delay".

26.0 LAND AND RIGHTS-OF-WAY

26.1 Prior to issuance of 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.

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

26.3 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.

27.0 SUSPENSION OF WORK, TERMINATION AND DELAY

27.1 The Contract Manager may suspend the work or any portion thereof for a period of not more than 90 days or such further time as agreed upon by the Contractor, by written notice to the Contractor 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 suspension.

27.2 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 repeatedly 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 of the work or if he disregards the authority of the Contract Manager, or if he otherwise violates any provision of the contract documents, then the Contract Manager may, without prejudice to any other right or remedy and after giving the Contractor and his surety a minimum of ten days from delivery of a written notice, terminate the services of the Contractor and take possession of the project and of all materials, equipment, tools, construction equipment and machinery thereon owned by 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 of the contract price exceeds the direct and indirect costs of completing the project, including compensation for additional professional services, such excess shall be paid to the Contractor. If such costs exceed such unpaid balance, the Contractor will pay the difference to the Owner. Such costs incurred by the Owner will be determined by the Contract Manager and incorporated in a change order.

27.3 Where the Contractor's services have been so terminated by the Contract Manager, said termination shall not affect any right of the Owner against the Contractor 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.

27.4 After ten days from delivery of a written notice to the Contractor, the Contract Manager 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.

27.5 If, through no act or fault of the Contractor, the work is suspended for a period of more than 90 days by the Contract Manager or under an order of court or other public authority, or the Contract Manager fails to act on any request for payment within 30 days after it is submitted, or the Owner fails to pay the Contractor substantially the sum approved by the Contract Manager or awarded by arbitrators within 30 days of its approval and presentation, then the Contractor may, after ten days from delivery of a written notice to the Contract Manager, terminate the contract and recover from the Owner payment for all work executed and all expenses sustained. In addition and in lieu of terminating the contract, if the Contract Manager has failed to act on a request for payment or if the Owner has failed to make any payment as aforesaid, the Contractor may, upon ten days written notice to the Contract Manager, 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.

27.6 If the performance of all or any portion of the work is suspended, delayed, or interrupted as a result of a failure of the Contract Manager to act within the time specified in the contract documents, or if no time is specified, within a reasonable time, an adjustment in the contract price or an extension of the contract time, or both, shall be made by change order to compensate the Contractor for the costs and delays necessarily caused by the failure of the Contract Manager.

28.0 INSPECTION AND TESTING

28.1 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.

28.2 The Owner shall provide any inspection and testing services beyond those required by the contract documents.

28.3 The Contractor shall provide at his expense the testing and inspection services required by the contract documents.

28.4 If the contract documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any work to specifically be inspected, tested, or approved by someone other than the Contractor, the Contractor will give the Contract Manager timely notice of readiness. The Contractor will then furnish the Engineer the required certificates of inspection, testing or approval.

28.5 Inspections, tests or approvals by the Contract Manager or others are for the sole use of the Owner and shall not relieve the Contractor from his obligations to perform the work in accordance with the requirements of the contract documents.

28.6 The Contract Manager and his representatives will at all times have access to the work. In addition, authorized representatives and agents of any participating federal or state agency shall be permitted to inspect all work, materials, 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.

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

28.8 If the Contract Manager considers it necessary or advisable that covered work be inspected or tested by others, the Contractor, at the Contracting Manager's request, will uncover, expose or otherwise make available for observation, inspection or testing that portion of

the work in question, furnishing all necessary labor, materials, tools and equipment. If it is found that such work is defective, the Contractor will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If, however, such work is not found to be defective, the Contractor will be allowed an increase in the contract price or 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.

29.0 CORRECTION OF WORK

29.1 The Contractor shall promptly remove from the premises all work rejected by the Contract Manager 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.

29.2 All removal and replacement work shall be done at the Contractor's expense. If the Contractor does not take action to remove such rejected work within 10 days after receipt of written notice, the Owner may remove such work and store the materials at the expense of the Contractor.

30.0 CHANGES IN THE WORK

30.1 The Contract Manager 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 change order.

30.2 The Contract Manager also may, 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 unless the Contractor believes that such field order entitles him to a change in contract price or time, or both, in which event he shall give the Contract Manager written notice thereof within seven days after the receipt of the ordered change. Thereafter the Contractor shall document the basis for the change in contract price or time within 30 days. The Contractor shall not execute such changes pending the receipt of an executed change order or further instruction from the Contract Manager.

31.0 CHANGES IN CONTRACT PRICE

31.1 The contract price may be changed only by a contract 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:

31.1.1 Unit prices previously approved.

31.1.2 An agreed lump sum.

31.1.3 The actual cost for labor, direct overhead, materials, supplies, equipment, and other services necessary to complete the work. In addition there shall be added an amount to be agreed upon but not to exceed 15% of the actual cost of the work to cover the cost of general overhead and profit.

32.0 DIFFERING SITE CONDITIONS

32.1 The Contractor shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the Contract Manager by written notice of:

32.1.1 Subsurface or latent physical conditions at the site differing materially from those indicated in the contract documents; or

32.1.2 Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract documents.

32.2 The Contract Manager shall promptly investigate the conditions, and if he finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the work, an equitable adjustment shall be made and the contract documents shall be modified by a change order. Any claim of the Contractor for adjustment hereunder shall not be allowed unless he has given the required written notice; provided that the Contract Manager may, if he determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

33.0 USE AND POSSESSION PRIOR TO COMPLETION

33.1 The Owner shall have the right to take possession of or use any completed or partially completed part of the work. Before taking possession of or using any work, the Contract Manager shall furnish the Contractor a list of items of work remaining to be performed or corrected on those portions of the work that the Owner intends to take possession of or use. However, failure of the Contract Manager to list any item of work shall not relieve the Contractor of responsibility for complying with the terms of the contract. The Owner's possession or use shall not be deemed an acceptance of any work under the contract.

33.2 While the Owner has such possession or use, the Contractor shall be relieved of the responsibility for the loss of or damage to the work resulting directly from the Owner's possession or use. If prior possession or use by the Owner delays the progress of the work or causes additional expense to the Contractor, an adjustment shall be made in the contract price, the time of completion or both, and the contract shall be modified in writing accordingly.

34.0 RECORD DRAWINGS

34.1 Record Drawings shall be prepared by the contractor and shall include: all information shown on the Contractors drawings and all deviations, modifications or changes from those drawings, however minor, which were incorporated in the work; all additional work not appearing on the contract drawings; and any changes made after the final inspection.

34.2 Record drawing shall be kept current and available on the job site at all times. No construction work shall be concealed until the necessary data has been recorded.

34.3 Record drawings will be jointly inspected for accuracy and completeness by the Contract Manager or his representative at, or just prior to, the contractor submitting requests for payment. Incomplete drawings will be corrected before payment approval is recommended (Reference section 40, "Payments to Contractor")

34.4 Record drawings shall accurately show, using details, notes, etc., the following information:

a. The project number, contract number, community name, and other relevant general information.

b. The location and description of any utility lines or other installations of any kind or description known to exist within the construction area. The location includes dimensions to permanent features.

c. The location and dimensions of any changes from the contract drawings.

d. Changes in design details or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor including but not limited to fabrication, erection, installation plans, and placing details, pipe sizes, insulation materials, dimensions or equipment foundations, etc.

e. The location and description of all buried facilities installed by the contractor including at least two ties to permanent features and bury depth of major components, fittings, appurtenances, and change of direction of pipelines.

f. All changes or modification which results from the final inspection.

g. All information as required in the technical specifications.

34.5 One copy of the Record Drawings shall be delivered to the Contract Manager with the Contractor's written request for final inspection. The Contract Manager will expedite drawings review and will provide written approval or disapproval prior to the final inspection. If the Record Drawings are disapproved, they will be returned to the Contractor for further work and re-submittal. Final payment will not occur until an approved set of drawings is received.

35.0 CLEANUP AND FINISH GRADING

35.1 The Contractor shall restore all areas disturbed by construction to a condition at least equal to that existing prior to construction. Excess construction materials, equipment, tools, waste excavation, and rubbish shall be removed. Excavated areas shall be finish graded to provide drainage as required by the drawings and technical specifications, or in the absence of specific requirements, to provide drainage away from the facilities constructed and to restore original drainage patterns in existence prior to construction and to provide drainage away from excavated areas and installed facilities.

36.0 MEASUREMENT AND PAYMENT

36.1 Completed items of work shall be measured and paid for in accordance with the requirements listed in the bid schedule and any subsequent approved change orders. Payment shall be based on the actual quantities completed and shall represent full compensation under the contract. The price paid for the completed item of work shall include full compensation for furnishing all labor, materials, (other than that furnished by the Owner), tools, equipment, and performing all work required by the provisions of the contract to furnish and install the item of work, complete in place. In all cases, the finished product shall be a complete, operational system or component. No payments will be made for materials on hand. The price for the completed item of work shall also include all applicable state and local sales and other taxes.

37.0 VARIATION IN ESTIMATED QUANTITIES

37.1 If the quantity of a unit-priced item in this contract is an estimated quantity and the actual quantity of the unit-priced item varies more than 25% above or below the estimated quantity, an equitable adjustment in the contract price shall be made upon demand of either party. The equitable adjustment shall be based upon any increase or decrease in costs due solely to the variation above 125% or below 75% of the estimated quantity. If the quantity variation is such as to cause an increase in the time necessary for completion, the Contractor may request, in writing, an extension of time, to be received by the Contract Manager within ten days from the beginning of the delay, or within such further period as may be granted by the Contract Manager before the date of final settlement of the contract. Upon the receipt of a written request for an extension, the Contract Manager shall ascertain the facts and make any appropriate adjustment for extending the completion date.

38.0 FINAL INSPECTION

38.1 38.1 Final inspection will be made by the Owner when the Contractor advises that all materials have been furnished, all the work has been performed, and all the construction provided for by the contract has been completed in accordance with its terms. The Contractor shall submit a written request to the Owner at least five working days before the requested final inspection date.

38.2 If a re-inspection or re-test is required because of uncompleted work, the Owner may charge the Contractor for re-inspection costs.

38.3 The Owner will provide written acceptance when all materials, work or other requirements of the drawings, specifications and contract are furnished or completed. The written acceptance will include the date the work is determined to be complete, and until such acceptance, the Contractor will be responsible for all work performed and materials delivered.

39.0 PAYMENTS TO CONTRACTOR

39.1 Payment requests shall be made on a monthly interval unless otherwise designated by the Contract Manager. The Contractor will submit to the Contract Manager a partial payment request filled out and signed by the Contractor covering the work performed during the period covered by the partial payment estimate and supported by such data as the Contract Manager may reasonably require. The request for payment may also include an allowance for the cost of such major materials and equipment which are suitably stored either at or near the site. If payment is requested on the basis of materials and equipment not incorporated in the work but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the Contract Manager, as will establish the Owner's title to the material and equipment and protect his interest therein, including applicable insurance. The Contract Manager will, within ten days after receipt of each partial payment estimate, either approve payment and present the partial payment estimate to the Owner, or return the partial payment estimate to the Contractor indicating in writing his reasons for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and resubmit the partial payment estimate. The Owner will, within 45 days of presentation to him of an approved partial payment estimate, pay the Contractor a progress payment on the basis of the approved partial payment estimate. The Owner shall retain 10% of the amount of each payment until final completion and acceptance of all work covered by the contract documents. The Owner at any time, however, after 75% of the work has been completed, if he finds that satisfactory progress is being made, may reduce retainage to 5% on the current and remaining estimates. When the work is substantially complete (operational or beneficial occupancy), the retained amount may be further reduced below 5% to only that amount necessary to assure completion. On completion and acceptance of a part of the work on which the price is stated separately in the contract documents, payment may be made in full, including retained percentages less authorized deductions.

39.2 The Owner reserves the right to withhold $10,000.00 retention for Six (6) months from completion of the project.

39.3 Upon completion and acceptance of the work, the Contract Manager shall issue a certificate attached to the final payment request that the work has been accepted by him under the conditions of the contract documents. Within 30 days of completion and acceptance of the work, the Owner shall pay the entire balance found to be due the Contractor including the retained percentages, but except such sums as may be lawfully retained by the Owner, shall

pay the entire balance found to be due the Contractor including the retained percentages, but except such sums as may be lawfully retained by the Owner.

39.4 The Contractor will indemnify and save the Owner or the Owner's agents harmless from all claims growing out of the lawful demands of subcontractors, laborers, workmen, mechanics, material men, and furnishers of machinery and parts thereof, equipment, tools, and all supplies, incurred in the furtherance of the performance of the work. The Contractor shall, at the Contract Manager's request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived. If the Contractor fails to do so the Contract Manager may, after having notified the Contractor, either arrange payment for unpaid bills or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor shall be resumed, in accordance with the terms of the contract documents, but in no event shall the provisions of this sentence be construed to impose any obligations upon the Owner to either the Contractor, his Surety, or any third party. In paying any unpaid bills of the Contractor, any payment so made by the Owner shall be considered as a payment made under the contract documents by the Owner to the Contractor and the Owner shall not be liable to the Contractor for any such payments made in good faith.

39.5 If the Owner fails to make payment 45 days after approval by the Contract Manager, in addition to other remedies available to the Contractor, there shall be added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the Contractor.

40.0 ASSIGNMENTS

40.1 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 obligations there under, without written consent of the other party.

41.0 GUARANTY

41.1 The Contractor shall guaranty all materials and equipment furnished and work performed for a period of one year from the date of substantial completion of the system that the completed system is free from all defects due to faulty materials or workmanship and the Contractor shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the systems resulting from such defects. The Contract Manager will give notice of observed defects with reasonable promptness. In the event that the Contractor should fail to make such repairs, adjustments, or other work that may be made necessary by such defects, the Owner may do so and charge the Contractor the cost thereby incurred. The performance bond, if required, shall remain in full force and effect through the guarantee period.

42.0 ACCEPTANCE OF FINAL PAYMENT AS RELEASE

42.1 The acceptance by the Contractor of final payment shall be and shall operate as a release to the Owner of all claims and all liability to the Contractor other than claims in stated amounts as may be specifically accepted by the Contractor for all things done or furnished in connection with this work and for every act and neglect of the Owner and others relating to or arising out of this work. Any payment, however, final or otherwise, shall not release the Contractor or his sureties from any obligations under the contract documents or the performance bond and payment bonds.

43.0 CONTRACT MANAGER'S ROLE AND AUTHORITY

43.1 The Contract Manager or his designee shall act as the Owner's representative during the construction period. 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 Contract Manager will make visits to the site and determine if the work is proceeding in accordance with the contract documents.

43.2 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.

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

43.4 The Contract Manager does not have authority to obligate the Owner to change in the terms of the contract without the approval of the Owner.

44.0 RESOLUTION OF DISPUTES

44.0 All claims, disputes and other matters in question arising out of, or relating 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 Section 43, shall be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association. This 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.

44.1 Notice of the demand for arbitration shall be filed in writing with the other party to the contract documents and with the American Arbitration Association. Demand for arbitration shall in no event be made on any claim, dispute or other matter in question which would be barred by the applicable statute of limitations.

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

45.0 EQUAL EMPLOYMENT OPPORTUNITY

45.1 During the performance of this contract, the Contractor agrees not to discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin.

45.2 The Contractor shall take affirmative action to ensure the applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

45.3 The Contractor agrees to post in conspicuous places available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

45.4 The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor state that all qualified applicants shall receive consideration for employment without regard to race, color, religion, sex, or national origin.

45.5 The Contractor shall send, to each labor union or representative of workers with which he/she has a collective bargaining agreement or other contract or understanding, a notice advising the labor union or workers' representative of the Contractor's commitment under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.

45.6 The Contractor shall comply with all provision of Executive Order No. 11246, as amended, and the rules, regulations, and relevant orders of the Secretary of Labor.

45.7 The Contractor shall furnish to the Contract Manager, all information required by Executive Order No. 11246, as amended, and by the rules, regulations, and orders of the Secretary of Labor. Standard Form 100 (EEO - 1), or any successor form, is the prescribed form to be filed within 30 days following the award, unless filed within 12 months preceding the date of award.

45.8 The Contractor shall permit access to its books, records, and accounts by the Owner, Owner's representatives or the Office of Federal Contract Programs (OFCCP) for the purposes of investigation to ascertain compliance with the applicable rules, regulations, and orders.

45.9 If the OFCCP determines that the Contractor is not in compliance with this clause or any rules, regulations, and orders of the Secretary of Labor, this contract may be canceled,

terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further contracts.

45.10 The Contractor shall include the terms and conditions of this section in every subcontract or purchase order unless exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order No. 12246, as amended, so that such provisions will be binding upon each subcontractor or vendor.

45.11 The Contractor shall take such action with respect to any subcontract or purchase order as the Contract Manager may direct as a means of enforcing these terms and conditions, including sanctions for noncompliance; provided, that if the Contractor becomes involved in, or is threatened with litigation with a subcontractor or vendor as a result of such direction by the Contract Manager, the Contractor may request the Owner and the United States to enter into such litigation to protect the interests of the United States.

46.0 CLEAN AIR AND WATER

46.1 The Contractor agrees to comply with all the requirements of section 114 of the Clean Air Act (42 U.S.C. 7414) and section 308 of the Clean Water Act (33 U.S.C. 1318) relating to inspection, monitoring, entry, reports, and information, as well as other requirements specified in section 114 and section 308 of the Clean Air Act and the Clean Water Act, and all regulations and guidelines issued to implement those acts before the award of this contract.

46.2 The Contractor agrees that no portion of the work required by this prime contract will be performed in a facility listed on the Environmental Protection Agency List of Violating Facilities on the date when this contract was awarded unless and until the EPA eliminates the name of the facility from the listing.

46.3 The Contractor agrees to use best efforts to comply with clean air standards and clean water standards at the facility in which the contract is being performed.

46.4 The Contractor agrees to insert the substance of this clause into any nonexempt subcontract.

END OF SECTION 007200

SECTION 007343
WAGE RATE REQUIREMENTS

SECTION 1 GENERAL

1.1 Federal Department of Labor prevailing wages are applicable for this project per the Davis-Bacon Act of 1931.

1.2 The wage determination of the Secretary of Labor will need to be administered for this project. The Contractor will be required to provide a Wage Rate Schedule just prior to the signing of the contract for work.

1.3 The Contractor can obtain the current minimum prevailing wage rates at https://www.sam.gov/wage-determinations. Applicable rates are for:

State:	California
County:	Humboldt
Construction Type:	Building
WD Number:	CA05

1.4 State Prevailing wage rates will also apply. Current Prevailing Wage Rates can be obtained from the CA Department of Industrial Relations (www.dir.ca.gov/dirdatabases.html)

1.5 The contractor shall abide by California Labor Code (LC), Chapter 1, commencing with Section 1720, Part 7 [California Labor Code Section 1720-1743] (pertaining to the payment of prevailing wages and administered by the California Department of Industrial Relations) are met.

1.6 The applicable wage rate determination on construction work will be the more restrictive of the rate prescribed in the State of California Labor Code (LC), Chapter 1, Section 1770-1784 or the Davis-Bacon Wage Determination.

1.7 The contractor shall comply with the anti-kickback act of 1986 (41 U.S.C. section 51-58) that prohibits attempted as well as completed “kickbacks”, which include any money, fees, commissions, credit, gift, gratuity, thing of value, or compensation of any kind.

SECTION 2 PRODUCTS

2.1 Not used.

SECTION 3 EXECUTION

3.1 Not used.

End of Section 007343

SECTION 009100
ADDENDA

PART 1 GENERAL

1.1 Description

A. Addenda shall be defined as a document that provides supplement, appendix, clarification, or addition to the bidding and contracting documents.

B. Addenda shall be the only official modification means to be implemented during the pre-bid timeframe of the project.

C. All potential bidder submitted requests of clarification and interpretation during the pre-bid time of the project, including submissions provided during the pre-bid conference shall be addressed in a single addendum. The single addendum shall be released three business days prior to the date of bid. All requests submitted following the official date of release of addendum shall be collected by the Owner. If a request is received following release of the addendum that warrants clarification prior to bidding the due date for bids can be postponed at the Owner's discretion. All other requests received following release of the addendum will be addressed with the successful bidder prior to ratification of the contract.

PART 2 PRODUCTS (not used)

PART 3 EXECUTION

3.1 The following is an example Addendum form similar to the one that will be provided for this contract.

Addendum Number _____
Date: _____
Project: _____
Owner: _____

This addendum provides changes and/or clarifications, to the Contract Documents. These modifications pertain to the sections referenced below and to all other referenced or applicable sections in the Contract Documents.

Please sign the addendum receipt acknowledgment form and return to the Owner with your cost proposal and other required forms and documents.

Changes and/or clarifications to the bidding and contracting documents are as follows:

1.

Addendum Receipt Acknowledgement Form

Receipt of Acknowledgement:

My firm received Addendum No. _____, consisting of _____ pages, for the

_____

Project on _____, 20___.

Name of Firm _____

Name (Print) _____

Name (Signature) _____

Date: _____

DIVISION 01
GENERAL CONDITIONS

SECTION 011000
SUMMARY OF WORK

PART 1 GENERAL

1.1 CONTRACTOR RESPONSIBILITY

A. Contractor responsibility for each item of work for the project includes provision of all labor, equipment, materials, supervision, and all other pertinent items of interest to competently and satisfactorily complete each task.

B. **Contractor to maintain service to all residences during construction of new system.** Contractor to provide WCCSD with 72 hours' notice of proposed water service disruptions. Planned water service disruptions shall comply with CPUC.

C. Contractor to provide submittal of planned construction activities. Submittal shall demonstrate how contractor proposes to maintain residential services during construction of new water system within the maximum allowable water service disruption time frame. Submittal shall show type and placement of all temporary water system components.

D. This project shall follow "Buy American" requirements as outlined by the Consolidated Appropriations Act, Division G, Title IV, 2014 as it relates to the use of American iron and steel.

1.2 ITEM PRICING

A. Contractor to include total cost for labor, equipment, materials, supervision, incidentals, general conditions, overhead, and profit in each item of the Bid Schedule as is applicable including permitting fees and contract security costs.

B. Measurement and payment for all work shall be per the contract BID SCHEDULE section 004100

1.3 WORK ITEMS BRIEF DESCRIPTION

A. General Conditions / County Permits
   a. The Contractor shall coordinate with all permitting agencies with jurisdiction over this project. These agencies will include, but are not limited to Humboldt County Department of Transportation and CalFire. The Contractor shall coordinate any inspections necessary and schedule work around requirements of the permits. The Contractor shall be required to adhere to all of the requirements including all mitigation which may be required in these permits.
   b. The Owner has applied for applicable permits. Upon receiving a Notice to Proceed from the Owner, the Contractor shall coordinate with the owner and applicable permitting agencies that he/she has been awarded the contract for this project. The Contractor shall fill out all necessary applications to complete the permit process

and may be required to provide a bond for an amount to be determined by the County.

c. The contractor will be issued a change order for compensation of the actual costs of the permits/ bonds.
d. The price paid for under this item of work shall include full compensation for facilitating and coordinating the permit process.

B. Temporary Facilities
   a. Refer to Section 015000 for details.
   b. Temporary facilities for the site include fencing, restroom facilities, material and equipment storage, temporary power, security, utilities, and all other required temporary structures and services needed to complete the scope of work for the project safely and efficiently.

C. Mobilization/Demobilization
   a. Refer to Section 017100 for details.
   b. Mobilization/Demobilization to include all required equipment, trucking, personnel, and incidentals required to move tools, equipment, and laborers to and from site.
   c. Billing and payment for mobilization/demobilization shall be seventy-thirty (70-30), seventy percent of the item shall be billed out under mobilization to the site(s), and thirty percent shall be billed out for demobilization from the site(s).

D. Foundation – 650,000 Gal. Water Tank
   a. Refer to Section 033000 for details.
   b. The price paid for the completed item of work shall include full compensation for furnishing all labor, materials, tools, equipment, and performing all work required for construction of the 650,000-gallon finish water tank foundation as required by the provisions of the contract as specified in the project plans, and as directed by the Engineer.
   c. The foundation design that has been provided is for reference only. The contractor is to provide a product submittal from the tank manufacturer with minimum foundation dimensions for approval prior to construction.

E. Coating / Painting
   a. Refer to Section 099600 for details.
   b. The price paid for the completed item of work shall include full compensation for furnishing all labor, preparations, materials, tools, equipment, and performing all work required to coat/paint tanks, pipes, and appurtenances as required by the provisions of the contract as specified in the contract documents, and as directed by the Engineer.

F. 650,000 Gallon Welded Steel Tank
   a. Refer to Section 221200 for details.
   b. The price paid for the completed item of work shall include full compensation for tank design, fabrication and construction, tank foundation, installation, shop drawings, and connections as shown in the project drawings. Includes furnishing all

labor, materials, tools, equipment, and performing all work required for 650,000-gallon welded steel tank with all required connections not covered by other items as required by the provisions of the contract as specified in the project plans, and as directed by the Engineer.

G. Clearing and Grubbing
   a. Refer to Section 311100 for details.
   b. Clearing for the project will include tree branch trimming, brush, tree, and shrubbery removal. The proposed site improvements will require grubbing of the existing grass and topsoil layers. Improvement areas will need to be grubbed down to solid native material. All materials generated during clearing and grubbing will need to be removed from the site and disposed of in strict accordance with applicable laws and regulations. The designated location for deposit of the material shall be submitted and approved prior to work occurring. Any removed materials that are wished to be retained by the landowner shall be retained by the landowner. The contractor shall coordinate with the landowner for disposal of retained material.
   c. Nesting bird surveys are required prior to vegetation removal. Contractor to notify the owner seven days prior to vegetation removal so that the survey can be conducted. Vegetation removal must be conducted within seven days after the survey is conducted.

H. Site Grading
   a. Refer to Section 312200 for details.
   b. Grading for the project will include, but not be limited to: rock slope protection, drainage facilities, grade contouring, retaining wall construction and minor cut and fill to construct a building site for the storage tanks as shown on the construction plans.

I. Erosion Control
   a. Refer to Section 312500 for details.
   b. Erosion control measures for the site include perimeter barriers, stabilized construction entrance, stockpile management, equipment/vehicle maintenance controls, and vegetation/shrubbery protection. Erosion and sediment controls are to be in place prior to grading and soil impacts occurring. Erosion/sediment controls to be maintained throughout construction activities and are to be repaired or replaced as required to maintain protection.

J. Aggregate
   a. Refer to Section 321123 for details.
   b. Measurement and payment to be per field verified delivered and installed tonnage used for portions of the project listed below.

Access Road	*¾" minus class II*
Tank Site	*1" rock*
Rock Dissipation	*6"-12" Cobble*

c. Aggregate base for road crossings and road repairs associated with trenching are considered incidental to the water line installation and other construction activities.
d. Aggregate base for under foundations, sidewalks, concrete pads, and miscellaneous concrete are considered incidental to concrete work and other construction activities.
e. Contractor to provide submittal for aggregate base to be used on site and receive approval prior to order or installation.
f. All base is to be delivered, installed, spread, and compacted using typical equipment. Following initial installation of base and compaction testing/verification subsequent installation of additional base to correct construction activity impacts will not merit additional compensation or time. The Contractor is responsible for protecting base in place following installation and prior to contract completion.
g. All quantities of materials delivered to the site will be contingent on Engineer verification for payments.

K. Chain Link Fencing and Gates
a. Refer to Section 323113 for Details.
b. Measurement and payment to be per field verified delivered and installed linear feet.
c. Contractor to provide submittal for fencing and receive approval prior to order or installation.
d. Chain Link Fencing and Gates paid under this item is limited to the water tank site as shown on the drawings.

L. Gabian Faced MSE Retaining Wall
a. Refer to Section 323234 for details.
b. The price paid for the completed item of work shall include full compensation for installation of all excavation, labor, equipment, materials and other appurtenances for a complete MSE wall as required by the provisions of the contract as specified in the project plans, and as directed by the Engineer.

M. 1” PE Water Service Line
a. Refer to Section 331100 for details.
b. Measurement and payment to be per actual linear footage installed and field verified by the Engineer.
c. The price paid for the completed item of work shall include full compensation for furnishing all labor, materials, tools, equipment, and performing all work required to provide 1”PE Water Serve Line as required by the provisions of the contract as specified in the project plans, and as directed by the Engineer.

N. 6” C906 (HDPE) Distribution Water Line
a. Refer to Section 331100 for details.
b. Measurement and payment to be per actual linear footage installed and field verified by the Engineer.

c. The price paid for the completed item of work shall include full compensation for furnishing all labor, materials, tools, equipment, and performing all work required to provide 8" C906 (HDPE) Distribution Water Line as required by the provisions of the contract as specified in the project plans, and as directed by the Engineer including, but not limited to connecting to existing water service and placement of all required valving.

O. Miscellaneous Piping / Valving / Joints
   a. Refer to Section 331100 for details.
   b. The price paid for the completed item of work shall include all piping, valves, joints, and connections necessary for plant operation and system distribution that is not specifically paid for elsewhere.
   c. Full compensation for furnishing all labor, materials, tools, equipment, and performing all work required by the provisions of the contract to install miscellaneous piping as specified in the contract documents, and as directed by the Engineer.

P. Altitude Control Valve
   a. Refer to Section 331216 for details.
   b. The price paid for the completed item of work shall include full compensation for installation of all material, tools, labor, equipment, and other appurtenances for a complete installation of tank controls as shown on the project drawings and as directed by the Engineer.

Q. Caltrans D73 Area Drain
   a. Refer to Section 334000 for details.
   b. The price paid for the completed item of work shall include full compensation for installation of all material, excavation, backfill, tools, labor, equipment, and other appurtenances for a complete installation as shown on the project drawings.
   c. Includes furnishing all product submittals, labor, materials, tools, equipment, and performing all work required to install as required by the provisions of the contract as specified in the project plans, and as directed by the Engineer.

R. 12" CMP Culvert Pipe
   c. Refer to Section 334000 for details.
   d. The price paid for the completed item of work shall include full compensation for installation of all material, excavation, backfill, tools, labor, equipment, and other appurtenances for a complete installation as shown on the project drawings.
   e. Includes furnishing all product submittals, labor, materials, tools, equipment, and performing all work required to install as required by the provisions of the contract as specified in the project plans, and as directed by the Engineer.

PART 2 MEASUREMENT & PAYMENT

Measurement and payment for all work shall be in accordance with the contract BID SCHEDULE, refer to Section 004100 and actual work as field measured and verified. No

payments will be made for materials on hand. All payments to be made following field verification of work.

END OF SECTION 011000

SECTION 011400
WORK RESTRICTIONS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions.

1.2 USE OF PREMISES

A. Use of Property: Limit use of premises to work in areas indicated and for the purpose of this specific project. Do not disturb portions of the property beyond the areas in which the Work is indicated. If disturbed, repair and restore to a condition equal to or greater than existed prior to impact.

B. Owner Occupancy: Allow for Owner and public occupancy of the site(s) and surrounding areas.

C. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

   a. Schedule deliveries to minimize use of driveways and entrances.

   b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.3 OCCUPANCY REQUIREMENTS

A. Occupancy: neighbors and the Owner will occupy existing adjacent properties during the entire construction period. Cooperate with neighbors during construction operations to minimize conflicts and facilitate use and access to their homes and businesses. Perform the Work, so as not to interfere with neighbor's operations.

1.4 SPECIAL WORK RESTRICTIONS

A. The following will not be tolerated or permitted on site.

   a. Loud or objectionable music or language.
   b. Visually explicit or profane clothing, language, and/or gestures.
   c. Smoking.

B. All products, adhesives, sealers, and chemicals associated with installation of materials and construction activities shall be low VOC content.

1.5 UTILITIES

A. Work requiring shutdown of utilities serving occupied areas must be scheduled in writing a minimum of seventy-two (72) hours in advance of shutdown or the minimum amount of time as required by the utility purveyor, whichever is greater.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

PART 4 MEASUREMENT AND PAYMENT (Not Used)

END OF SECTION 011400

SECTION 012400
VALUE ENGINEERING

PART 1 GENERAL

1.1 DESCRIPTION

A. The Contractor may submit to the Owner value-engineering (VE) proposals that change the Contract Documents resulting in Construction Cost Savings and Time Savings. The Owner will share with the Contractor any cost savings that result from an approved VE proposal.

1.2 REQUIREMENTS

A. The VE proposal must maintain the essential functions and characteristics of the facility including but not limited to safety, service life, ease of maintenance, and appearance.

B. The Contractor's Conceptual VE proposal will be reviewed by the Owner, and if approved, the Contractor shall submit a formal VE proposal including revised drawings prepared and stamped by a California licensed Professional Engineer, specifications, distribution of quantities and cost savings, which reflect the work required to complete the VE proposal.

1.3 CONDITIONS

A. The Owner will be the sole judge of the VE proposal in determining the following:

   a. Approval or Disapproval
   b. Construction Cost Savings
   c. Time Savings
   d. Advantages and/or Disadvantages

B. The Owner reserves the right to disregard the contract unit bid prices if, in the judgment of the Engineer, such prices do not represent fair value for the work to be performed or deleted. The Engineer will adjust the contract unit bid prices in evaluating the Construction Cost Savings of the VE proposal. If the Owner approves the VE proposal, the Owner will order changes to the Contract Documents that reflect the VE proposal in accordance with the contract documents.

A. Seventy five percent (75%) of the Contractor's share when the Engineer has accepted the work related to the VE Scope.

1.4 REIMBURSEMENT

A. The Owner will not reimburse the Contractor for any engineering or preparation expenditures of the VE proposal.

PART 2 PRODUCTS (not used)

PART 3 EXECUTION (not used)

PART 4 MEASUREMENT AND PAYMENT (not used)

4.1 MEASUREMENT AND PAYMENT

A. If the Owner approves the VE proposal, the Owner will provide measurements and payments in accordance with the contract documents.

B. The Owner and the Contractor shall equally share the Construction Cost Savings amount resulting from the VE proposal. The Contractor shall receive twenty-five percent (25%) of the Contractor's share when the VE proposal is approved.

END OF SECTION 012400

SECTION 012500
PRODUCT SUBSTITUTIONS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:

a. Division 01 Section "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

b. Divisions 02 through 48 for specific requirements and limitations for substitutions.

1.3 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by the Contractor.

a. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.

b. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantages to the Contractor and/or the Owner.

1.4 ACTION SUBMITTALS

A. Substitution Requests: Submit two (2) copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

a. Substitution Request Form: Use CSI Form 13.1A or approved alternate.

b. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

i. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
ii. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
iii. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
iv. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
v. Samples, where applicable or requested.
vi. Certificates and qualification data, where applicable or requested.
vii. List of similar installations for completed projects with project names and addresses and names and addresses of Engineers and Owners.
viii. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
ix. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
x. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
xi. Cost information, including a proposal of change, if any, in the Contract Sum.
xii. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
xiii. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

c. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Engineer will notify Contractor through Construction Manager of acceptance or rejection of proposed substitution within fourteen (14) calendar days of receipt of request, or seven (7) calendar days of receipt of additional information or documentation, whichever is later.

i. Forms of Acceptance: Change Order, Construction Change Directive, or Engineer's Supplemental Instructions for minor changes in the Work.

ii. Use product specified if Engineer does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 PRODUCTS

2.1 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than fourteen (14) calendar days prior to time required for preparation and review of related submittals.

a. Conditions: Engineer will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Engineer will return requests without action, except to record noncompliance with these requirements:

i. Requested substitution is consistent with the Contract Documents and will produce indicated results.
ii. Requested substitution provides sustainable design characteristics that specified product provided.
iii. Substitution request is fully documented and properly submitted.
iv. Requested substitution will not adversely affect Contractor's construction schedule.
v. Requested substitution has received necessary approvals of authorities having jurisdiction.
vi. Requested substitution is compatible with other portions of the Work.
vii. Requested substitution has been coordinated with other portions of the Work.
viii. Requested substitution provides specified warranty.
ix. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is

uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Engineer will consider requests for substitution if received within thirty (30) calendar days of issuance of the Notice to Proceed. Requests received after that time may be considered or rejected at the discretion of the Engineer.

a. Conditions: Engineer will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Engineer will return requests without action, except to record noncompliance with these requirements:

i. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Engineer for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
ii. Requested substitution does not require extensive revisions to the Contract Documents.
iii. Requested substitution is consistent with the Contract Documents and will produce indicated results.
iv. Requested substitution provides sustainable design characteristics that specified product provided.
v. Substitution request is fully documented and properly submitted.
vi. Requested substitution will not adversely affect Contractor's construction schedule.
vii. Requested substitution has received necessary approvals of authorities having jurisdiction.
viii. Requested substitution is compatible with other portions of the Work.
ix. Requested substitution has been coordinated with other portions of the Work.
x. Requested substitution provides specified warranty.
xi. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 EXECUTION (Not Used)

PART 4 MEASUREMENT AND PAYMENT (Not Used)

END OF SECTION 012500

SECTION 012613
REQUESTS FOR INTERPRETATION (RFI)

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Applicable for the entire project plan and specification.

1.2 SECTION INCLUDES

A. Administrative and procedural requirements for handling and processing RFI.

1.3 DEFINITIONS

A. Definitions used in this article are not intended to change or modify the meaning of other terms in the Contract Documents.

B. Request for Interpretation (RFI): A request for information by the Contractor to the Owner/Engineer for clarification of intent of any portion of the Contract Documents after the Award of Contract and during the construction of the Project.

C. The following are NOT Requests for Interpretation.

a. Change Orders.
b. Construction Change Directives.
c. Substitution Request.
d. Bulletin.
e. Field Order.
f. Shop Drawings.
g. Normal questions contained in a typical shop drawing submittal.
h. Clarifications during Bidding.

1.4 REQUESTS FOR INTERPRETATION (RFI's) DURING CONSTRUCTION

A. RFI’s are logged-in at the Engineer's Office, not necessarily with same date as indicated by the Contractor on RFI form. The response time will commence upon the date of receipt by the Engineer.

a. E-mail copies of RFI’s sent by the Contractor and received on or after a Friday after 2:00 PM are to be dated the following Monday, holidays excepted.

B. RFI: If clarification of any portion of Construction Documents is required, submit a RFI to the Engineer and the Owner’s Representative in accordance with the following procedures:

a. RFI Format:
    i. Submit on a standard form developed by the Contractor.
    ii. RFI's shall be sequentially numbered; and include the following:
        1. Date
        2. Project name and number
        3. Contractor’s name, address, telephone number and fax number.
        4. Description of subject and discipline (trade) in question.
        5. Adequate space for Engineer to respond, sign, and date.
    iii. Contractor shall submit a copy of the format to the Engineer and Owner’s Representative at start of Project for review, comment, and acceptance.

C. RFI Inquiry:

a. Clearly state and completely define the issue requiring interpretation. Provide drawing and detail numbers, specification section numbers and paragraphs, sketches and other reference information.
b. Provide potential solutions to issues when possible.
c. Provide cost and schedule implications, if any.
d. Ambiguous RFI’s will be returned to Contractor without formal action.

D. RFI Submission Process:

a. The Contractor shall submit an RFI, in writing, to Engineer immediately with a copy to the Owner’s Representative when any issue requiring clarification arises.
    i. Unless specifically stated on RFI, the Engineer and the Owner will assume adjustment to the Contract Amount and the Project Schedule is not required.
    ii. The Engineer will review and respond only to RFI’s received in writing from the Contractor. When possible, email RFI's can be accepted given the Owner, Engineer, and Contractor agree and Contractor is able to verify delivery of RFI either email receipt, follow up phone call or alternate method.
    iii. For paper RFI; submit one (1) copy of each RFI and Engineer response, including any supplemental drawings and additional instructions, to the Owner’s Representative for recording purposes.
    iv. Review and response of RFI by Owner/Engineer will be accomplished within seven (7) calendar days from the date of receipt.
    v. RFI’s submitted to the Engineer without following these submission procedures will result in rejection of the submission without review and comment.

E. RFI Log:

a. Contractor must maintain an RFI log indicating the RFI number, subject, date, response date and impact, if any on schedule, and cost.

b. Contractor is to provide the updated log, at least once a month, to the Engineer and Owner's Representative and at the request of the Engineer and/or Owner's Representative.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

PART 4 MEASUREMENT AND PAYMENT (Not Used)

END OF SECTION 012613

SECTION 012657
CHANGE ORDER REQUEST

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Administrative and procedural requirements for proposing, processing, and securing Change Orders.

1.2 COST COMPUTATION

A. The cost of change orders to the contract will be computed as follows:

a. In all cases, regardless of the method used to determine values of changes, estimated or actual cost shall be submitted in detailed breakdown form, giving quantity and unit costs of each item, labor costs, allowable overhead and profit.

b. Where unit prices have not been established for the contract, the work shall be based on a lump sum adjustment determined by criteria outlined under Section 007200. The allowances including all overhead, commission, profit, and bond to be allowed for increase shall in no case exceed the percentages of net extra costs as itemized in Sections 007200 and 007210.

i. For change orders these percentages shall include, but not be limited to:

1. Insurance (other than mentioned herein),
2. Bonds,
3. Field and office supervisors and assistants,
4. Use of small, portable tools and equipment, whether manual or automatic generally designed for individual use by a tradesman.
5. Use of any manual tools and equipment, regardless of size, portability or end use,
6. Average job engineering, stakeout, and layout.
7. Incidental job burdens.
8. General administrative costs required by reasonable extension of contract time, if necessary, as directly caused by the change.

ii. Cost shall be computed to include actual cost of:

1. Labor, including pro-rated charges for foremen.
2. Materials entering permanently into the work.
3. Ownership or rental cost of construction equipment during time of use for the extra work.
4. Power and consumable supplies for the operation of power equipment.

5. Insurance related to labor benefits required under union agreements.
6. Social Security and unemployment insurance.
7. Applicable taxes.

B. Estimates for materials shall be based on reasonable, current prices at which materials are available to the Contractor and subcontractor(s). Satisfactory evidence of such costs shall be submitted with proposed change order.

C. When additions and credits are involved in any one change order, the allowance for overhead and profit shall be figured on the basis of net increase, if any. Full credit, not including allowances for Contractor's overhead, profit, or commission shall be given the Owner for deductions. Values of taxes shall be included in deductions.

D. No work on proposed changes shall be started until the proposed changes have been approved by the Engineer and Owner.

   a. Exception: Where an emergency or a situation requires that changes in contract work be done prior to formal approval of the Change Order, the Authority shall issue a proceed order to the Contractor who must maintain an accurate account of all labor and material involved in the change. All proceed orders shall be followed by change order(s) in the approved manner prior to contract settlement, final payment, and release of retention.

      i. All Proceed Order time and material costs are subject to verification. Contractor must notify the Engineer, Owner, and/or Owner Representative when work on such changes is to start and when complete. All appropriate documentation itemizing time and materials must be provided to the Engineer/Owner.

      ii. To receive full recognition, labor assigned to contract changes via Proceed Order must, insofar as possible, work continuously on the change rather than interchanging between contract work and the change work.

E. In order that proposed changes in work, if they should occur, can be processed without undue delay, the Contractor shall indicate in each separate proposal requesting a change in the contract supporting information in detailed breakdown form including, at a minimum, the following:

   a. The exact location of the change requested.

   b. The square feet, square yards, cubic yards, linear measure, or any other unit of measure applicable to the work involved, together with the unit cost of labor and material by trades. Labor unit cost shall include associated insurance. Other types of protection are assumed to be covered by overall job insurance with no additional changes assigned to unit costs.

c. Justification/clarification of the need for the change.

d. Viable options for completing the proposed change with support documentation and associated costs.

e. Valued engineering, when possible.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

PART 4 MEASUREMENT AND PAYMENT (Not Used)

END OF SECTION 012657

SECTION 012900
PAYMENT PROCEDURES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
B. Related Sections include the following:
    a. Division 01 Section "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

1.03 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.04 SCHEDULE OF VALUES

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

    a. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:

        i. Application for Payment forms with Continuation Sheets.
        ii. Submittals Schedule.
        iii. Contractor's Construction Schedule.

    b. Submit the Schedule of Values to Contracting Officer at earliest possible date but no later than seven calendar days before the date scheduled for submittal of initial Applications for Payment.

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

    a. Identification: Include the following Project identification on the Schedule of Values:

i. Project name and location.
ii. Name of Engineer.
iii. Name of Construction Manager
iv. Project Number.
v. Contractor's name and address.
vi. Date of submittal.

b. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

i. Related Specification Section or Division.
ii. Description of the Work.
iii. Name of subcontractor.
iv. Name of manufacturer or fabricator.
v. Name of supplier.
vi. Change Orders (numbers) that affect value.
vii. Dollar value.
1. Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

c. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.

d. Round amounts to nearest whole dollar; total shall equal the Contract Sum.

e. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

i. Differentiate between items stored on-site and items stored off-site. If specified, include evidence of insurance or bonded warehousing.

f. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

g. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

i. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

h. Schedule Updating: Update and resubmit the Schedule of Values before the next Application for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.05 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Contracting Officer and paid for by Owner.

a. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

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

C. Payment Application Forms: Use forms provided by Contracting Officer for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Contracting Officer will return incomplete applications without action.

a. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.

b. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

E. Transmittal: Submit two (2) signed and notarized original copies of each Application for Payment to Contracting Officer by a method ensuring receipt within twenty-four (24) hours. One copy shall include waivers of lien and similar attachments if required.

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

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

a. Submit partial waivers on each item for amount requested in previous application, after deduction for retention, on each item.

b. When an application shows completion of an item, submit final or full waivers.

c. The Contracting Officer reserves the right to designate which entities involved in the Work must submit waivers.

d. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to the Contracting Officer.

G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.

a. Submit partial waivers on each item for amount requested in previous application, after deduction for retention, on each item.

b. When an application shows completion of an item, submit final or full waivers.

c. Contracting Officer reserves the right to designate which entities involved in the Work must submit waivers.

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

e. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Contracting Officer.

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

a. List of subcontractors.

b. Schedule of Values.

c. Contractor's Construction Schedule (preliminary if not final).

d. Products list.

e. Schedule of unit prices.

f. Submittals Schedule (preliminary if not final).

g. List of Contractor's staff assignments.

h. List of Contractor's principal consultants.

i. Copies of building permits (if applicable).

j. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.

k. Initial progress report.

l. Report of preconstruction conference.

m. Certificates of insurance and insurance policies.

n. Construction Contract Security.

o. Data needed to acquire Owner's insurance.

p. Initial settlement survey and damage report, if required.

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

a. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.

b. This application shall reflect Certificates of Partial Substantial Completion issued previously for Government occupancy of designated portions of the Work.

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

a. Evidence of completion of Project closeout requirements.

b. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.

c. Updated final statement, accounting for final changes to the Contract Sum.

d. Evidence that claims have been settled.

e. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.

f. Final, liquidated damages settlement statement.

1.06 APPLICATIONS FOR PAYMENT

A. In general, payment may take 120 calendar days after application for payment is received. Contractor will not be paid within 30 calendar days of an invoice submittal. Contractor is advised to obtain bridge financing if necessary to maintain project cash flow.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A Measurement and payment for all work shall be in accordance with the contract BID SCHEDULE, refer to Section 004100 and actual work as field measured and verified. No payments will be made for materials on hand. All payments to be made following field verification of work.

END OF SECTION 012900

SECTION 013100
PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.1 DESCRIPTION

A. This section details the Contractor and the Owners' responsibilities in coordinating efforts for this project

PART 2 PRODUCTS (not used)

PART 3 EXECUTION

3.1 CONTRACT DOCUMENTS

A. The Contractor and all subcontractors shall become completely familiar with the requirements of the contract documents.

B. In the event discrepancies or conflicts are encountered, notify the Engineer immediately. Where there is a discrepancy, including referenced Codes, the documents requiring the strictest interpretation, higher quality, the greater quantity, or the more difficult work shall govern, unless otherwise determined by the Engineer.

3.2 REQUEST FOR INFORMATION

A. Refer to Section 012613.

B. The Contractor shall coordinate the sequencing of work so that Requests for Interpretation (RFI's) be submitted to the Engineer in a timely manner so as not to delay work.

3.3 SCHEDULE

A. The contractor shall submit a Schedule of Work prior to commencing work.

B. The Schedule of Work shall be updated monthly at a minimum, and MUST BE submitted with any Request for Payment.

3.4 UTILITIES

A. The Contractor shall coordinate with all utility companies that must be relocated or have connection to in the project area. Coordination shall include scheduling with utility companies when various stages of work may be performed and when potential shutdowns may occur.

3.5 PERMITS

A. The Contractor shall coordinate with all permitting agencies with jurisdiction over this project. The Contractor shall coordinate any inspections necessary and schedule work around requirements of the permits. The Contractor shall be required to adhere to all of the requirements including all mitigation which may be required in these permits.

3.6 OWNER

A. The Contractor shall coordinate with the Owner or Owners' Representative for all work to be performed.

3.7 INSTALLATION

A. Coordination methods at the Project Site are the responsibility of the Contractor. The Engineer may disapprove Work completed by the Contractor or data submitted by the Contractor, when in the Engineer's judgment, coordination has been inadequate to ensure the highest quality.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A Measurement and payment for all work shall be in accordance with the contract BID SCHEDULE, refer to Section 004100 and actual work as field measured and verified. No payments will be made for materials on hand. All payments to be made following field verification of work.

END OF SECTION 013100

SECTION 013200
CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.1 DESCRIPTION

A. The intent of the progress schedule is to assist the Contractor, Engineer, and Owner in planning and executing Work and to assist the Project Coordinator and Owner in monitoring the construction progress for the purpose of coordination, communication, evaluation of Applications and Certificates for Payment, and evaluation of time extension requests.

B. The Project Coordinator's review of the schedule will be to ensure that it conforms to the requirements of the contract documents. The construction means, methods, sequence and scheduling of the work is the Contractor's responsibility and is not reviewed by the Project Coordinator or Owner. Contract completion date(s) is as specified in the Notice to Proceed and subsequent adjustments as ratified per Sections 007200 and 012613. The Project Coordinator's review of the schedule does not change, revise, or amend that date(s), nor does it constitute an approval of the Contractor's ability to complete the work within the Contract Time.

C. If the Contractor submits a schedule which indicates a construction completion date prior to the advertised contract completion date, it is understood that the Owner shall not be obligated for any costs associated with any extensions of the Contractor's schedule which is still within the stipulated contract completion period. No contract time extension shall be granted until the contractor demonstrates that the Critical Path is directly impacted, and the construction completion date must be extended past the stipulated contract completion date.

1.2 FORMAT

A. Listings: Reading from left to right, in ascending order for each activity. Identify each activity with the applicable Specification section number.

B. Diagram Sheet Size: must be legible.

1.3 SCHEDULES

A. Provide a time scaled CPM precedence diagram with a separate activity bar for each work activity. Network diagram to illustrate order and interdependence of activities and sequence of work; how start of a given activity depends on completion of preceding activities, and how completion of the activity may restrain start of subsequent activities. Indicate early and late start, early and late finish, float time, duration, manpower loading and description of each activity. Indicate critical path.

B. Provide as many activities as necessary to clearly show how the project will be constructed within the time allowed. As a minimum, every item on the schedule of values must be shown on the progress schedule. Provide sub-net schedules where necessary to enhance clarity.

C. Show complete sequence of construction by activity, identifying work of separate stages and other logically grouped activities.

D. Show accumulated percentage of completion of each item of Work at time of each Application for Progress Payment.

E. As a sub-net show dates including specified Project Coordinator's review time for shop drawings, product data, and samples. Indicate decision date for selection of finishes.

F. Show product delivery dates, including those furnished and/or installed by Owner.

G. Show dates when application for separate permits (i.e., fire alarm, fire sprinkler, etc.) will be made and when the permit will be received.

H. Show dates when application for warranties/guarantees will be made and when warranties will be delivered. Final payment will not be made until all warranties/guarantees have been received and determined to be acceptable.

I. Include dates for Project Coordinator's punch list review and completion of punch list items.

J. Include dates for submission of operation and maintenance manuals and project record drawings (minimum of thirty days before final completion). Show Project Coordinator's review time and re-submittal of corrected manuals and drawings.

1.4 UPDATING SCHEDULES

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity at the time of the revision date. Update diagrams to graphically depict current status of Work.

C. Indicate revision date on revised schedule.

D. Show changes occurring since previous Schedule submission such as:

a. Any major changes in scope;
b. Activities modified since previous submission;
c. Revised projections for progress and completion, as applicable;
d. Any other identifiable changes.

E. Provide narrative report as needed to define:

a. Problem areas; anticipated delays; and impact of these on the project schedule.
b. Corrective action recommended, and its effect.

F. The periodic Applications and Certificates for Payment will not be processed until the progress schedule is updated and submitted as specified.

1.5 SUBMITTALS

A. Within fourteen (14) calendar days after date of Owner-Contractor Agreement, submit proposed network diagram defining planned operations for the Work.

B. If required by Project Coordinator, participate in review of network diagrams jointly with General Contractor.

C. Submit updated network schedules with each Application for Payment or more frequent if directed by Project Coordinator.

D. Submit the number of opaque reproductions the Contractor requires, plus two (2) copies which will be retained by Project Coordinator.

1.6 DISTRIBUTION

A. Distribute copies of reviewed schedules to project site file, Contractors, suppliers, Factory/Engineering Firm, Project Coordinator, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

PART 4 MEASUREMENT AND PAYMENT (Not Used)

END OF SECTION 013200

SECTION 013300
SUBMITTALS

PART 1 GENERAL

1.1 SUBMITTAL PROCEDURES

A. Schedule submittals to expedite the Project. Transmit submittals in accordance with approved Progress Schedule and in such sequence to avoid delay in the Work. Coordinate submission of related items with schedule. Submit Schedule of Submittals to Project Coordinator prior to initial Application for Payment.

B. Make and deliver all submittals to Project Coordinator.

C. Provide space for General Contractor to review stamps.

D. General Contractor must review and certify each submittal prior to submission to Project Coordinator. Mark certification on each submittal with permanent marking ink.

E. Reproduce and distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions. Pay all costs for reproduction, distribution, and materials.

F. Submit items requiring color selection within thirty (30) calendar days of contract award. Colors will be selected after all color submittals are received by Project Coordinator.

G. Coordinate submittals into groupings containing all associated items to facilitate review of inter-related items:

   a. Finishes, selection of colors, textures, or patterns.
   b. Associated items which require correlatio0n for efficient function or for installation.
   c. Submit all Division 2 submittals at the same time. Failure to do so will delay processing and review by the Project Coordinator or Owner's Consulting Engineer. Review will not occur until submittal is complete.

H. Identify in writing variations from Contract Documents. Identify in writing product or system limitations detrimental to successful performance of the completed Work.

I. Accompany submittals with transmittal letter containing:

   a. Date.
   b. Project title and number.
   c. Contractor's name and address.
   d. Number of copies of Shop Drawings, Product Data, and Samples submitted.
   e. Identification of submittal as it relates to:

i. Contractor/Supplier/Manufacturer.
    1. Name.
    2. Address.
    3. Telephone number.
    4. Representative's name.

f. Detail number and location in Construction Documents.
g. Specifications reference number and paragraph.
h. Applicable Standards.

e. Finishes.
f. Identification of deviations from Contract Documents.

J. Additional Information Required:

a. Relation to adjacent structure or materials.
b. Fabrication methods, assembly, special installation requirements, accessories, fasteners, and other pertinent information.
c. Field dimensions, clearly identified.
d. Coordination with other trades. Stamped and signed by affected trades.

K. Distribution of Submittals:

a. Project Coordinator will retain a minimum of two (2) copies of all submittals, with one (1) set of reviewed submittals retained as "Record Documents". Mark up with as-built information and provide to Owner as part of Project Record Documents.
b. General Contractor to maintain one (1) set of reviewed submittals at project site.

1.2 PROPOSED PRODUCTS LIST AND CONTRACTORS LIST

A. Prior to submission of First Application for Payment, submit complete list of Contractors and suppliers to be used for the Work. Provide specification section identification number, addresses, and telephone numbers for each listed Contractor and supplier.

B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.3 SHOP DRAWINGS

A. Prior to submission of First Application for payment, submit complete list of all shop drawings, product data and/or sample submittals as required by these specifications. List to include date columns showing anticipated and actual Submittal dates to General Contractor and Project Coordinator as well as return dates from General Contractor and Project Coordinator. Update this list for use at the Progress Meetings.

B. Present in clear and thorough manner. Title each drawing with Project name and number; identify each element of drawings by reference to sheet number and detail, schedule, or room number of Contract Documents.

C. Identify field dimensions; show relation to adjacent or critical features or Work or products.

D. Minimum Sheet Size: 8½ x 11 inches.

E. Do not submit freehand drawings.

F. On shop drawings requiring Code Agency approval, submit on format and media required by Approval Agency. Include information required by Project Documents and Approval Agency.

G. Submit four (4) copies to General Contractor for review. The General Contractor will return two (2) reviewed copies with comments. After review and correction, the Contractor shall reproduce and distribute copies of the shop drawings as required for Contractor use and contractor's needs. Provide the copy of final Submittal to Owner for the Project records.

H. Do not provide Submittals not required by these specifications. They will be returned to the Contractor and/or Factory/Engineering Firm without review.

1.4 PRODUCT DATA

A. Submit only pages which are pertinent; mark each copy of standard printed data to identify pertinent products, referenced to Specification Section and Paragraph number. Show reference standards, performance characteristics, and capacities; wiring and piping diagrams and controls; component parts; finishes; dimensions; and required clearances.

B. Do not submit Material Safety Data Sheets (MSDS). MSDS are Contractor and Factory/Engineering Firm safety, means and methods responsibilities. MSDS will not be reviewed.

C. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the Work. Delete information not applicable.

D. Submit four (4) copies of product data and manufacturer's instructions to General Contractor for review. The General Contractor will return two (2) reviewed copies with comments. After review and correction, the Contractor shall reproduce and distribute copies as required for Contractor use and contractor's needs. Provide the copy of final submittal to Owner and Project Coordinator for their records.

1.5 SAMPLES

A. Submit full range of manufacturer's standard and special finishes except when more restrictive requirements are specified, indicating colors, textures, and patterns, for Project Coordinator's selection.

B. Submit samples which may be used in the Work as indicated in the Specification section.

C. Label each sample with identification required for transmittal letter.

D. Submit two (2) samples of each product requiring color or texture/finish selection unless specified otherwise in individual specification sections: one (1) sample will be retained by Project Coordinator, one (1) sample will be returned to the Contractor to be retained at the job site.

E. Field samples are to be maintained at the site of the Work and are to be removed after substantial completion unless directed otherwise.

F. Reviewed samples which may be used in the Work are indicated in individual specification Sections.

1.6 MANUFACTURER'S CERTIFICATES AND WARRANTIES

A. When specified in individual specification Sections, submit manufacturer's certificate and/or warranty to Project Coordinator for review, in quantities specified for Product Data.

B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference date, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Project Coordinator.

D. Provide certificate and/or warranty by manufacturer on company letterhead paper or forms signed by an officer of the manufacturer. On document name the Owner, project, project location, Contractor, and Contractor's address. Indicate product furnished, quantity furnished, and date of delivery.

1.7 CONTRACTOR REVIEW

A. Coordinate submittals with requirements of Work and of Contract Documents.

B. Apply Contractor's stamp with signature. The submittal signed by the Contractor certifies that the Contractor has reviewed the submittal for accuracy, completeness, and compliance in accordance with the General Conditions. It also certifies that the Contractor has verified product required, field dimensions, adjacent construction Work and Contract Documents. Submittals without Contractor's stamp and signature will be

rejected. Notify Project Coordinator in writing at time of submittal of any deviations from requirements of Contract Documents.

1.8 RESUBMITTALS

A. Revise and resubmit submittals as required, identify all changes made since previous submittal.

B. Shop Drawings and Product Data:

a. Revise initial drawings or data, and resubmit as specified for the initial submittal.
b. Indicate any changes which have been made including those requested by the Project Coordinator.

C. Samples: Submit new samples as required.

1.9 PROJECT COORDINATOR REVIEW

A. Project Coordinator will review shop drawings, product data, and samples and return submittals within twenty-one (21) calendar days.

B. For Project Coordinator's color selection, allow thirty (30) calendar days from time all color samples for the Work have been delivered to the Project Coordinator.

C. Project Coordinator review is only for general conformance and compliance with Project design concept and Contract Documents. Any action shown is subject to Contract Document's requirements. Contractor is responsible for dimensions (confirm and correlate at job site); fabrication processes; construction techniques; quantities; space requirements; coordination of work with that of all other trades; union jurisdiction; infringements of patent rights; possible cause of injury to persons or property; and satisfactory performance of the work.

D. Project Coordinator's review of separate items does not constitute review of assembly in which it functions.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

PART 4 MEASUREMENT AND PAYMENT (Not Used)

END OF SECTION 013300

SECTION 013591
CONSTRAINTS AND MITIGATIONS

PART 1 GENERAL

1.1 DESCRIPTION

A. The following requirements supplement the General Conditions, 007200.

PART 2 PRODUCTS (not used)

PART 3 EXECUTION

3.1 CONSTRAINTS AND MITIGATIONS

A. The Owner has completed an environmental review process governed by the various rules, regulations, and codes of the regulating body. In compliance with the environmental review document, the Contractor's operations are subject to the following constraints and environmental protection measures. In addition to these, the Contractor is also responsible for compliance with any and all constraints or environmental protection measures that may be noted in other sections of the Technical Specifications.

B. The Contractor's operations are subject to the following constraints and mitigations:

1. If buried materials are encountered, all soil disturbing work should be halted at the location of any discovery until a qualified archaeologist completes a significance evaluation of the find(s) pursuant to Section 106 of the national Historic Preservation Act (36CFR60.4). The Owner shall be contacted immediately. Prehistoric archaeological site indicators expected within the general area include: chipped chert and obsidian tools and tool manufacture waste flakes; grinding and hammering implements that look like fist-size river tumbled stones, and for some rare sites, locally darkened soil that generally contains abundant archaeological specimens. Historic remains expected in the general area commonly include items of ceramic, glass, and metal. Features that might be present include structure remains (e.g., cabins or their foundations) and pits containing historic artifacts.

2. This project is located in an area of potential habitat for the Trinity Bristol Snail. During ground disturbing operations a monitor will be required onsite to observe and remove any snails within the work area at no cost to the contractor. The contractor shall accommodate the monitor including stopping work whenever snail surveys are necessary.

3.2 SITE CONDITIONS

A. Coordination with the Inspector:

1. Contact the Inspector at least five (5) days in advance of any planned removal of historic fabric, demolition, or ground disturbance work. The Inspector will in turn notify the Archaeologist/Cultural/Natural Resource Specialist when such work is planned.

2. Contractor shall coordinate directly with the Inspector regarding archaeological/cultural/natural specialist monitoring. Any ensuing directives from the archaeologist/cultural/natural specialist in relation to need for interruption of specific contractor work will be made through the Inspector.

B. Limit of Work

1. Contractor shall layout all planned removal, demolition, or ground disturbance work for review and approval prior to such work commencing.

2. Contractor shall avoid all removal, demolition, ground disturbance, and other destructive activities that may disturb historic fabric, artifacts, archaeological, cultural or natural resources until the Inspector gives approval to proceed.

C. Role of Archaeologist/Cultural/Natural Specialist

1. Prior to the construction start date, but during the submittal period, archaeologist/cultural/natural specialist(s) will attempt to mark or identify, where certain historical fabric, cultural resources are to be documented, salvaged, or left in situ place on the building/structure/feature/site as identified in the construction documents. This by no means is meant to indicate that during the course of demolition, ground disturbance, or destructive activities, that the contractor is free to move forward without first obtaining permission to proceed from the Inspector, or that during the course of such actions, new or previously unknown areas will not be marked or identified by the archaeologist/cultural specialist.

2. During construction, archaeologist/cultural/natural specialist will monitor all demolition, ground disturbance, or destructive activities.

3. Archaeologist/cultural/natural specialist will determine whether appropriate treatments such as handwork, will be necessary for certain demolition, ground disturbance, or destructive activities. Directives in relation to need for alteration of technique or interruption of specific contractor work will be given by the Inspector.

D. Down Time

1. If unforeseen cultural/natural resources are uncovered during execution of the work, the Inspector will put work on hold at that specific location, and the Contractor will be redirected to other tasks. The archaeologist/cultural/natural

specialist will record and evaluate the find and implement avoidance, preservation, or recovery measures as appropriate compliance with environmental law and department resource directives prior to Inspector directing resumption of work at that specific location.

2. Contractor shall include in the project schedule, consideration of up to (not less than) five (5) calendar days down time for unforeseen conditions uncovered during execution of work that may require further resource analysis. Down time days must be approved by the Inspector.

3.3 PROTECTION OF EXISTING RESOURCES

A. Provide required protection, in areas identified on drawings, or as directed by the Inspector to maintain integrity of the resources to be protected during the course of the project.

PART 4 MEASUREMENT AND PAYMENT (Not Used)

END OF SECTION 013591

014000
BEST MANAGEMENT PRACTICES

The Following - Construction Best Management Practices (BMPs) were selected from the California Stormwater Quality Association (CASQA) are listed for the contractor's convenience. *All practices contained in the BMP Handbook shall be reviewed by the contractor and implemented if applicable.*

WM-1	Material Delivery and Storage
WM-2	Material Use
WM-3	Stockpile Management
WM-4	Spill Prevention and Control
WM-5	Solid Waste Management
WM-8	Concrete Waste Management
NS-9	Vehicle and Equipment Fueling

WM-1 Material Delivery and Storage

Primary objective: Waste Management and Materials Pollution Control

Description and Purpose: Prevent or reduce or eliminate the discharge of pollutants from material delivery and storage to the stormwater system or watercourses by minimizing the storage of hazardous materials onsite, storing materials in a designated area, installing secondary containment, conducting regular inspections, and training employees and subcontractors.

This best management practice covers only material delivery and storage. For other information on materials, see WM-2 Material Use, or WM-4, Spill Prevention and Control.

Applications:

- Delivery and storage of concrete components
- Delivery and storage of petroleum products such as fuel, oil, and grease .
- Hazardous chemical acids, lime, glues, adhesives, paints, solvents, and curing compounds.
- Concrete compounds
- Other materials that may be detrimental if released to the environment.

Limitations: Space limitations may preclude indoor storage.
Storage sheds often must meet building and fire code requirements.

Implementation: The following steps should be taken to minimize risk:

- Temporary storage area should be located away from vehicular traffic.
- Material Safety Data Sheets (MSDS) should be supplied for all materials stored. The Spill Prevention and Control Plan shall include all MSDS.
- Construction site areas should be designated for material delivery and storage.

- Material delivery and storage areas should be located near the construction entrances, away from waterways, if possible. Avoid transport near drainage paths or waterway.
- Storage of reactive, ignitable, or flammable liquids must comply with the fire codes of your area. Contact the local Fire Marshal to review materials, quantities, and proposed storage area to determine specific requirements. See the Flammable and Combustible Liquid Code, NFAA30
- An up to date inventory of materials delivered and stored onsite should be kept.
- Hazardous materials should be handled as infrequently as possible.
- During the rainy season, consider materials in a covered area. Store materials in secondary containments such as earthen dike, horse trough, for non-reactive materials such as detergents, oil, grease, and paints. Non-reactive materials such as detergents, oil, grease, and paints shall be contained in a watertight container
- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items on a pallet and when possible, in secondary containment with the same. See WM-3 Stockpile Management.
- All chemicals shall be labeled and stored in a closed container.
- Employees and subcontractors should be trained on the proper material delivery and storage practices.
- Employees trained in emergency spill cleanup procedures must be present when dangerous materials or liquids chemicals are unloaded.

Material Storage Area and Practices

- Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 should be stored in approved containers and drums and should not be overfilled. Containers and drums should be placed in temporary containment facilities for storage.
- A temporary containment facility should provide for a spill containment volume able to contain precipitation from a 25 year storm event, plus the greater of 10% of the aggregate volume of all containers or 100% of the capacity of the largest container within its boundary, whichever is greater.
- A temporary containment facility should be impervious to the materials stored therein for a minimum contact time of 72 hours.
- A temporary containment facility should be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills should be collected and placed into drums. These liquids should be handled as a hazardous waste unless testing determines them to be non-hazardous. All collected liquids or non-hazardous liquids should be sent to an approved disposal site.
- Sufficient separation should be provided between stored containers to allow for spill cleanup and emergency response to access.
- Incompatible materials, such as chlorine and ammonia, should not be stored in the same temporary containment facility.
- Throughout the rainy season, each temporary containment facility should be covered during non-working days, prior to, and during rain events.
- Materials should be stored in their original containers and the original product labels should be maintained in place in a legible condition. Damaged or otherwise illegible labels should be replaced immediately.

- Bagged and boxed materials should be stored on pallets and should not be allowed to accumulate on the ground. To provide protection from wind and rain throughout the rainy season, bagged and boxed materials should be covered during non-working days and prior to and during rain events.
- Stockpiles should be protected in accordance with WM-3, Stockpile Management.
- Materials should be stored indoors within existing structures or sheds when available.
- Am ample supply of appropriate spill clean-up material should be kept near storage areas.

Material Storage Area and Practices

- Keep an accurate, up-to-date inventory of material delivered and stored onsite.
- Arrange for employees trained in emergency spill cleanup procedures to be present when dangerous materials or liquid chemicals are unloaded.

Spill Cleanup

- Contain and clean up any spill immediately.
- Properly remove and dispose of any hazardous materials or contaminated soil if significant residual materials remain on the ground after construction is complete. See WM-4, Spill Prevention and Control, for spills of chemicals and/or hazardous materials.

Inspection and Maintenance:

- Inspect and verify that activity based BMPs are in place prior to commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Keep an ample supply of spill cleanup materials near the storage area.
- Keep storage areas clean, well-organized, and equipped with ample cleanup supplies as · appropriate for the materials being stored.
- Repair or replace perimeter controls, containment structures, covers, and liners as needed to maintain proper function.

WM-2 Material Use

Primary objective: Waste Management and Materials Pollution Control

Description and Purpose: Prevent or reduce the discharge of pollutants to the storm drain system or watercourses from material use by using alternative products, minimizing hazardous material use onsite, and training employees and subcontractors.

Description and Purpose: Apply for the following materials used onsite:

- Petroleum products such as fuel, oil, and grease
- Asphalt and other concrete compounds
- Other hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and

curing compounds.
- Concrete compounds
- Other materials that may be detrimental to the environment

Implementation: The following steps should be taken to minimize risk:
- Minimize use of hazardous materials onsite.
- Follow manufacturer instruction regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.
- Train employee and subcontractors in proper material use.
- Supply Material Safety Data Sheets (MSDS) for all materials.
- Dispose of latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths, when thoroughly dry and are no longer hazardous, with other construction debris.
- Do not remove the original product label; it contains important safety and disposal information. Use the entire product before disposing of the container.
- Mix paint indoor or in containment area. Never clean paintbrushes or rinse paint containers
- into a street, gutter, storm drain, or watercourse. Dispose of any paint thinners, residue, and sludge(s) that cannot be recycled, as hazardous waste.
- For water-based paint, clean brushes to the extent practicable, and rinse into a concrete washout pit located in the staging area. For oil based, paint, clean brushes to the extent practicable, and filter and reuse thinners and solvents.
- Use recycled and less hazardous products when practical. Recycle residual paints, solvents, non-treated lumber, and other materials.
- Use materials only where and when needed to complete the construction activity. Use safer alternative materials as much as possible. Reduce or eliminate use of hazardous materials onsite when practical.
- Keep an ample supply of spill clean-up material near use areas. Train employees in spill clean-up procedures.
- Avoid exposing applied materials to rainfall and runoff unless sufficient time has been allowed for them to dry.

Inspection and Maintenance:
- Inspect and verify that activity based BMPs are in place prior to commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Maintenance of this best management practice is minimal
- Spot check employees and subcontractors throughout the job to ensure appropriate practices are being employed.

WM-3 Stockpile Management

Primary objective: Waste Management and Materials Pollution Control

Description and Purpose: Stockpile management procedures and practices are designed to

reduce or eliminate air and stormwater pollution from stockpiles of soil, paving materials and pressure- treated wood.

Implementation: Protection of stockpiles is a year-round requirement. To properly manage stockpiles:

- Locate stockpiles a minimum of 50 feet away from concentrated flows of stormwater, drainage courses, and inlets.
- Protect all stockpiles from stormwater run on using a temporary perimeter sediment barrier.
- Use sandbags as a temporary perimeter sediment barrier.
- Implement wind erosion control practices as appropriate on all stockpiled material including Wind Erosion Control.

Protection of Non-Active Stockpiles

Non-active stockpiles of the identified materials should be protected further as follows:

Soil stockpiles

- During the rainy season, soil stockpiles should be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier at all times.
- During the non-rainy season, soil stockpiles should be covered or protected with a temporary perimeter sediment barrier prior to the onset of precipitation.

Stockpiles of Portland cement concrete rubble, asphalt concrete, asphalt concrete rubble, aggregate base, or aggregate subbase

- During the rainy season, the stockpiles should be covered or protected with a temporary sediment perimeter barrier at all times.
- During the non-rainy season, the stockpiles should be covered or protected with a temporary perimeter sediment barrier prior to the onset of precipitation.

Stockpile of "cold mix"

- During the rainy season, cold mix stockpiles should be placed on and covered with plastic. or comparable material at all times.
- During the non-rainy season, cold mix stockpiles should be placed on and covered with
- plastic or comparable material prior to the onset of precipitation.

Protection of Active Stockpiles

Active stockpiles of the identified materials should be protected further as follows:

- All stockpiles should be protected with sandbags prior to the onset of precipitation.
- Stockpile of “cold mix" should be placed on and covered with plastic or comparable material prior to the onset of precipitation.

Inspection and Maintenance:

- Inspect and verify that activity based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Repair and/or replace perimeter controls and covers as needed to keep them functioning properly. weekly during the rainy season and of two-week intervals in the

non-rainy season to verify continued BMP implementation.
- Repair and/or replace perimeter controls and covers as needed to keep them functioning properly.

WM-4 Spill Prevention and Control
Primary objective: Waste Management and Materials Pollution Control

Description and Purpose: Prevent or reduce the discharge of pollutants to drainage systems or watercourses from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

This best management practice covers only spill prevention and control. However, WM-1, Materials Delivery and Storage, and WM-2, Material Use, also contain useful information particularly on spill prevention.

Applications:
- Soil stabilizers/binders
- Dust palliatives
- Fuels
- Lubricants
- Other petroleum distillates

Limitations:
- This BMP applies to spills caused by contractor and subcontractors.
- Procedures and practices presented in this BMP are general. Contractor should identify appropriate practices for the specific materials used or stored on site. This BMP has been· specifically written to address this project. The contractor will include additional information when hired.

Implementation: The following steps will help reduce the stormwater impacts of leaks and spills.

Education
- Be aware that different materials pollute in different amounts. Make sure that each employee knows that a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills.
- Educate employees and subcontractors on potential dangers to humans and the environment form spills and leaks.
- Hold regular meetings to discuss and reinforce appropriated disposal procedures (incorporate into regular safety meetings). The project Manager and/or Engineer shall hold weekly meeting with the contractor and all employees at the staging area to discuss construction activities and BMPs.
- Establish a continuing education program to indoctrinate new employees.
- Have contractor's superintendent or representative oversee and enforce spill prevention and control measures.

General Measures

- To the extent that the work can be accomplished safely, spill of oils, petroleum products, substances listed under 40 CDF parts 110, 107, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.
- Store hazardous materials and wastes in covered containers and protect from vandalism.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Train employees in spill prevention and cleanup.
- Designate responsible individuals to oversee and enforce control measures.
- Spill should be covered and protected from stormwater run on during rainfall to the extent that it doesn't compromise clean-up activities.
- Do not bury or wash spill with water.
- Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.
- Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with WM-10, Liquid Waste Management.
- Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.
- Place proper storage, cleanup, and spill reporting instructions for hazardous materials stored
- or used on the project site in an open, conspicuous, and accessible location.
- Keep waste storage areas clean, well-organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter control, containment structures, covers, and liners should be respired or replaced as needed to maintain proper function.

Cleanup

- Clean up leaks and spills immediately.
- Use a rag for small spills on paved surfaces, a damp mop for general cleanup, and absorbent material for larger spills. If the applied material is hazardous, the used cleanup materials are also hazardous and must be sent to either a certified laundry (rag) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly.

Minor Spills

- Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.
- Use absorbent materials on small spills rather than hosing down or burying the spill.
- Absorbent materials should be promptly removed and disposed of properly.
- Follow the practice below for a minor spill:
    - Contain the spread of the spill
    - Recover spilled materials.

- Clean the contaminated area and properly dispose of contaminated materials.

Semi-Significant Spills

- Semi-significant spills still can be controlled by the first responder along with the aid of other personnel such as laborers and the foreman, etc. This response may require the cessation of all other activities.
- Spills should be cleaned up immediately
  - Contain spread of the spill
  - Notify the project foreman immediately.
  - If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
  - If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
  - If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills

- For significant or hazardous spills that cannot be controlled by personnel in the immediate' vicinity, the following steps should be take:
  - Notify the local emergency response by dialing 911. In addition to 911, the contractor will notify the following local Fire Department and the Office of Emergency Services for the location of the project. It is the contractor's responsibility to have all emergency phone numbers at the construction site.
- Notification should first be made by telephone and followed up with a written report.
  - The services of spill contractor or a Haz-Mat team should be obtained immediately.
  - Construction personnel should not attempt to clean up until the appropriate and qualified staff have arrived at the job site.
  - Other agencies which may need to be consulted, but are not limited to, the Fire Department, the Public Works Department, the Coast Guard, the Highway Patrol, the City/County Police Department, Department of Toxic Substances, California Division of Oil and Gas, CALIOSHA, etc.

Reporting

- Report significant spills to local agencies, such as Fire Department; they can assist in cleanup.
- Federal regulations require that any significant oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hours).

Use the following measures related to specific activities:

Vehicle and Equipment Maintenance

- If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the run on of stormwater and the runoff of spills.

- Regularly inspect onsite vehicles and equipment for leaks and repair immediately.
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fuel. Do not allow leaking vehicles or equipment onsite.
- Always use secondary containment, such as drain pan to catch spills or leaks when removing or changing fluids.
- Place drips pans under construction equipment when not in use.
- Use absorbent materials on small spills rather than hosing down or burying the spill.
- Remove the absorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- Oil filters disposed of in trashcans or dumpsters can leak oil and pollute stormwater. Place
- the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal.
- Oil filters can also be recycled. Ask the oil supplier or recycler about recycling oil filters
- Store cracked batteries in a non-leaking secondary container. Do this with all cracked .
- batteries even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

- If fueling must occur onsite, use designated area, located away from drainage course, to prevent the run on of stormwater and the runoff of spills.
- Discourage “topping off” of fuel tanks.
- Always use secondary containment, such as drain pan, when fueling to catch spill/leaks.

Inspection and Maintenance:

- Inspect and verify that activity based BMPs are in place prior to commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur.
- Keep supplies of spill control and cleanup materials onsite, near storage, unloading and maintenance areas.
- Update your spill prevention and control plan and stock cleanup materials as changes occur in the types of chemicals onsite.

WM-5 Solid Waste Management

Description and Purpose: Solid waste management procedures and practices are designed to prevent or reduce the discharge of pollutants to stormwater from solid or construction waste

by providing designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.

Applications:

- Solid waste generated from packaging materials including wood, paper, and plastic.
- Scrap or surplus building materials including scrap metals, rubber, plastic, glass pieces and masonry products.
- Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, plastic wrappers, and cigarettes.
- Construction waste including brick, mortar, timber, steel and metal scraps, pipe and electrical cuttings, non-hazardous equipment parts, Styrofoam and other materials used to transport and package construction materials.

Implementation:
The following steps will help keep a clean site and reduce stormwater pollution:

- Select designated waste collection areas onsite.
- Inform trash-hauling contractors that you will accept only watertight dumpsters for onsite. use. Inspect dumpsters for leaks and repair any dumpster that is not watertight.
- Locate containers in a covered area or in a secondary containment.
- Provide an adequate number of containers with lids or covers that can be placed over the container to keep rain out or to prevent loss of wastes when it is windy.
- Plan for additional containers and more frequent pickup during the demolition of construction. Container filled with solid waste shall be transported to the Eureka transfer center daily during dock demolition.
- Collect site trash each day, especially during rainy and windy conditions.
- Remove this solid waste promptly since erosion and sediment control devices tend to collect litter.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids,
- additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Do not hose out dumpsters on the construction site. Leave dumpsters cleaning to the trash hauling contractor.
- Arrange for regular waste collection before containers overflow.
- Clean up immediately if a container does spill.
- Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas.

Education

- •Have the contractor's superintendent or representative oversee and enforce proper solid waste management procedures and practices.
- •Instruct employees and subcontractors on identification of solid waste and hazardous waste.
- Educate employees and subcontractor on solid waste storage and disposal procedures.
- Require that employees and subcontractors follow solid waste handling and storage
- procedures.

- Prohibit littering by employees, subcontractors, and visitors.
- Minimize production of solid waste materials wherever possible.

Collection. Storage. and Disposal

- Littering on the project site should be prohibited.
- To prevent clogging of the storm drainage system, litter and debris removal from drainage graters, trash racks, and ditch lines should be priority.
- Trash receptacles should be provided in the staging area where workers also congregate for lunch and break periods.
- Litter from work areas within the construction limits of the project site should be collected and placed in watertight dumpsters at least weekly, regardless of whether the litter was generated by the contractor, the public, or others. Collected litter and debris should not be placed in or next to drain inlets, stormwater drainage inlets, stormwater drainage systems, or watercourses.
- Dumpsters of sufficient size and number should be provided to contain the solid waste generated by the project.
- Full dumpsters should be removed from the project site and the contents should be disposed of by the trash hauling contractor.
- Construction debris and waste should be removed from the site biweekly or more frequently as needed.
- Construction material visible to the public should be stored or stacked in an orderly.
- Stormwater run on should be prevented from contacting stored solid waste. All solid waste shall be stored in watertight dumpsters.
- •Solid waste storage areas should be located at least 50 feet from drainage facilities and watercourses and should not be located in areas prone to flooding or ponding.
- Segregate potentially hazardous waste from non-hazardous construction site waste.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Have hazardous waste hauled to an appropriate disposal site and/or recycling facility.
- Salvage or recycle useful vegetation debris, packaging and surplus building materials when practical. For example, trees and brush from land clearing can be used as a brush barrier, or converted into wood chips, then used as mulch on graded areas. Wood pallets, cardboard boxes, and construction scraps can also be recycled.

Inspection and Maintenance:

- Inspect and verify that activity-based BMPs are in place prior to commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur.
- Inspect construction waste areas regularly
- Arrange for regular waste collection.

WM-8 Concrete Waste Management
Primary objective: Waste Management and Materials Pollution Control

Description and Purpose: Prevent or reduce the discharge of pollutants to stormwater from concrete waste by performing onsite washout in designated area and training employee and subcontractors.

Applications:
- Concrete is used as a construction material.
- Concrete trucks and other concrete-coated equipment are washed onsite.

Limitations: Offsite washout of concrete waste may not be possible.

Implementation: The following steps will help reduce stormwater pollution from concrete waste:
- Discuss the concrete management techniques described in the BMP (such as handling of concrete waste and washout) with ready-mix concrete supplier before any deliveries are made.
- Incorporate requirements for concrete waste management into material supplier and subcontractor agreements.
- Store dry and wet materials under cover, away from drainage areas
- Avoid mixing excess amount of fresh concrete
- Perform washout of concrete trucks offsite or in designated areas only.
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped on site.
- For onsite washout:
    - Locate washout area at least 50 feet from storm drains, open ditches, or water bodies.
    - The designated concrete washout area shall be located in the staging area or as shown plans.
    - Do not allow runoff from this area.

Education:
- Educate employees, subcontractors, and suppliers on the concrete waste management techniques described herein.
- Arrange for contractor's superintendent or representative to oversee and enforce concrete waste management procedures.

Concrete Slurry Wastes
- PCC and AC waste should not be allowed to enter storm drains or watercourses.
- PCC and AC waste should be collected and disposed of or placed in temporary concrete washout facility.
- A sign should be installed adjacent to the temporary concrete washout facility to inform concrete equipment operators to utilize the proper facility.

- The contractor shall utilize a below grade washout facility. The sediment is primarily composed of sand at the staging area. If excavation is not practical (i.e., pit collapses due to high fraction of sand in the sediment), then above temporary washout facility may be constructed.
- A foreman or construction supervisor should monitor onsite concrete working tasks, such as saw cutting, coring, grinding, and grooving to ensure proper methods are implemented.
- Slurry residue should be vacuumed and disposed in a temporary pit (as described in Onsite Temporary Concrete Washout Facility, Concrete Transit Truck Procedures below) and allowed to dry. Dispose of dry slurry residue in accordance with WM-5, Solid Waste Management.

Onsite Temporary Concrete Washout Facility. Transit Truck Washout Procedures

- Temporary concrete washout facilities should be located a minimum of 50 feet from storm drain inlets, open drainage facilities, and watercourses. Each facility should be located away from construction traffic or access areas to prevent disturbance or tracking.
- A sign should be installed adjacent to each washout facility to inform concrete equipment operators to utilize the proper facilities.
- Temporary concrete washout facilities should be constructed above grade or below grade at the option of the contractor. Temporary concrete washout facilities should be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.
- Temporary washout facilities should have a temporary pit or berm areas of sufficient
- volume to completely contain all liquid and waste concrete materials generated during washout procedures.
- Washout of concrete trucks shall be performed in designated areas only.
- Only concrete from mixer truck chutes should be washed into concrete wash out.
- Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated washout area or properly disposed offsite.
- Once concrete wastes area washed into the designated area and allowed to harden, the concrete should be broken up, removed, and disposed per WM-5, Solid Waste Management. Dispose of hardened concrete on a regular basis.
- Temporary Concrete Washout Facility (Type Above Grade)
    - Temporary concrete washout facility (type above grade) should be constructed with a recommended minimum length and minimum width of 10 ft, but with sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations.
    - Plastic lining material should be a minimum of 10 mil in polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.
- Temporary Concrete Washout Facility (Type Below Grade)
    - Temporary concrete washout facilities (type below grade) should be constructed with recommended minimum length and minimum width of 10 ft. The quantity and volume should be sufficient to contain all liquid and concrete waste generated by washout operations.
    - Plastic lining material should be a minimum of 10 mil polyethylene sheeting and

should be free of holes, tears, or other defects that compromise the impermeability of the material.

Removal of Temporary Concrete Washout Facilities

- When temporary concrete washout facilities are no longer required for the work, the hardened concrete should be removed and disposed of. Materials used to construct temporary concrete washout facilities should be removed from the site of the work and disposed of.
- Holes, depressions or other ground disturbance caused by removal of the temporary concrete
- washout facility should be backfilled and repaired.

Inspection and Maintenance:

- Inspect and verify that activity based BMPs are in place prior to commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Temporary concrete washout facility should be maintained to provide adequate holding capacity with a minimum freeboard of 4 in. for above grade facilities and 12in for below grade facilities. Maintaining temporary concrete washout facilities should include removing and disposing of hardened concrete and returning the facilities to a functional condition. Hardened concrete materials should be removed and disposed of.
- Washout facilities must be clean, or new facilities must be constructed and ready for use once the washout is 75% full.

WM-9 Sanitary/Septic Waste Management

Primary objective: Waste Management and Materials Pollution Control

Description and Purpose: Proper sanitary and septic waste management prevent the discharge of pollutants to stormwater from sanitary and septic waste by providing convenient, well maintained facilities, and arranging for regular service and disposal.

Applications:

Sanitary septic waste management practices are suitable for use at all construction sites that use temporary or portable sanitary and septic waste systems.

Implementation:

Sanitary and septic wastes should be treated or disposed of in accordance with state and local requirements. In many cases, one contract with a local facility supplier will be all that it takes to make sure sanitary wastes re properly disposed.

Storage and Disposal Procedures

- Temporary sanitary facilities should be located away from drainage facilities,

watercourses, and from traffic circulation. When subjected to high winds or risk of high winds, temporary sanitary facilities should be secured to prevent overturning.
- Wastewater should not be discharged or buried within the project site.
- Only reputable, licensed sanitary and septic waste haulers should be used.
- Sanitary facilities should be located in a convenient location.
- Untreated raw wastewater should never be discharged or buried.
- Sanitary facilities should be maintained in good working order by a licensed service.
- Regular waste collection by a licensed hauler should be arranged before facilities overflow.

Education
- Educate employees and subcontractors and suppliers on sanitary waste storage and disposal procedures.
- Educate employees and subcontractors and suppliers in identification of sanitary waste.
- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meeting).
- Establish a continuing education program to indoctrinate new employees.

Inspection and Maintenance:
- Inspect and verify that activity based BMPs are in place prior to commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Arrange for regular waste collection
- Portable sanitary facilities must be secured with spikes down to prevent over turning.

NS-9 Vehicle and Equipment Fueling
Objectives:
- Non-Stormwater Management Control

Description and Purpose: Vehicle equipment fueling procedures and practices are designed to prevent fuel spills and leaks and reduce or eliminate contamination of stormwater. This can be accomplished by using offsite facilities, fueling in designated areas only, enclosing or covering stored fuel, implementation spill control, and training employees and subcontractors in proper fueling procedures.

Application: These procedures are suitable on all construction sites where vehicle and equipment take place.

Implementation:
- Use offsite fueling stations as much as possible. These businesses are better equipped to handle fuel and spills properly. Performing this work offsite can also be economical by eliminating the need for a separate fueling area at a site.
- Discourage "topping off' fuel tanks.
- Absorbent spill cleanup materials and spill kits should be available in fueling areas on

fueling trucks and should be disposed of properly after use. All absorbent pads will be placed in the hazardous material dumpster for later disposal at an approved disposal site.

- Drip pans should be used during vehicle and equipment fueling.
- Avoid mobile fueling of mobile construction equipment around the site, rather, transport the equipment to designated fueling areas. With the exception of tracked equipment such as bulldozers and large excavators, most vehicles should be able to travel to a designated area with little lost time. All construction equipment will be transported back to the staging area at the end of each working day.
- Train employees and subcontractors in proper fueling and cleanup procedures.
- When fueling must take place onsite, designate an area away from drainage courses to be used.
- Dedicate fueling areas should be protected from stormwater run on and run off and should be located at least 50 feet away from downstream drainage facilities and watercourses. Fueling must be performed on level-grade areas.
- Protect fueling areas with berms and dikes to prevent runoff, and to contain spills.
- Nozzles used in vehicle and equipment fueling should be equipped with automatic shutoff to control drips. Fueling operations should not be left unattended.
- Use vapor recovery nozzles to help control drips as well as air pollution where required by Air Quality Management Districts. The contractor shall determine if recovery nozzles are need at the project site.
- Federal, state, and local requirements should be observed for any stationary above ground storage tanks. There will be no fuel storage tanks at the project site. A fuel delivery truck shall deliver the fuel once a day to the staging area and fuel the equipment before leaving the site.

Inspection and Maintenance:

- Vehicle and equipment should be inspected each day of use for leaks. Leaks should be repaired immediately, or problem vehicles or equipment should be removed from the project site.
- Keep ample supplies of spill cleanup materials onsite.
- Immediately clean up spills and properly dispose of contaminated soil and cleanup materials.
- Should contaminated soil be collected at the staging area, then it shall be stockpiled separately from non-contaminated sediment stockpile and disposed appropriately.

Additional Best Management Practices

- Dust Control / Wind Erosion Control
  - Contractor shall implement appropriate control measures such as spraying of water or covering of material.
  - Street and site cleaning and sweeping.
- Saw Cutting and Pavement removal

    - Contractor shall contain all materials created during these activities such as dust or slurry
- Protect and establish vegetation. The root structures of plants and trees help keep soil in place while leaves and canopies help dissipate rainfall energy to prevent dislodging and transporting of soil.
- Stabilize construction entrances and exits to prevent tracking onto roadways. As vehicles enter and leave construction sites, pollutants such as sediment, gravel and other loose particles are spread onto adjacent roads. Those pollutants can get washed into roadside ditches and are a nuisance to drivers when damage to vehicle paint or windshields occurs. Protect exposed slopes from erosion through preventative measures. Cover the slopes to avoid contact with storm water by hydroseeding, applying mulch or using plastic sheeting.
- Install straw wattles (fiber rolls) and silt fences on contour to prevent concentrated flow. Straw wattles should be buried 3 to 4 inches into the soil, staked every 4 feet, and limited to use on slopes that are no steeper than 3 units horizontal to 1 unit vertical. Silt fences should be trenched 6 inches by 6 inches into the soil, staked every 6 feet, and placed 2 to 5 feet from any toe of slope. Avoid the use of hay bales as sediment control devices. They have high failure rates and the hay is better suited as ground cover.
- Use brooms and shovels whenever possible to maintain a clean site instead of a hose. Introducing more water than necessary only adds to water pollution.
- Designate a concrete washout area to avoid wash water from concrete tools or trucks from entering gutters, inlets or storm drains. Maintain washout area and dispose concrete waste on a regular basis.
- Establish a vehicle storage, maintenance and refueling area to minimize the spread of oil, gas and engine fluids. The use of oil pans under stationary vehicles is strongly recommended.
- Protect drainage inlets from receiving polluted storm water through the use of filters such as fabrics, gravel bags or straw wattles.
- Check the weather forecast and be prepared for rain by having necessary materials onsite before the rainy season.
- Inspect all BMPs before and after a storm event. Maintain BMPs on a regular basis and replace as necessary.
- Street Sweeping and Cleaning: The Contractor is to implement a street sweeping and cleaning schedule for the duration of the project. The existing frontage improvements, including but not limited to existing curb & gutter, and paved roadways are to be kept free of debris. Material tracked onto the frontage improvements during construction activities, such as moving vehicles and equipment on and off the site, are to be cleaned at the end of each workday. Hand broom sweeping and washing will be acceptable for minor material removal. Street sweeping with mechanical equipment will need to be conducted at least once a week to address any materials tracked onto existing improvements.

Additional requirements listed in section 011000 Summary of Work

END OF SECTION 014000

SECTION 014500
QUALITY CONTROL

PART 1 GENERAL

1.1 SUMMARY

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

B. Contractor reserves the right to arrange and pay for a qualified independent testing agency to perform required testing for the project. Test reports shall be submitted to the Owner within forty-eight (48) hours of receipt by Contractor.

C. Owner will retain its own third-party independent firm to conduct field testing/inspections and provide for all necessary laboratory tests and reports.

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

   a. Specified test, inspections, and related actions do not limit the Contractor's quality-control efforts as necessary to provide compliance with the Contract Document requirements.
   b. Requirements for the Contractor to provide quality-control services required by the Designer, the Owner, or authorities having jurisdiction are not limited by the provisions of this section.

1.2 DEFINITIONS

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

B. Quality-Control Services: tests, inspections, procedures, and related actions before, during, and after execution of the work to evaluate completed construction complies with contract and construction industry requirements. Quality control services do not include contract enforcement activities performed by the Owner or the Designer of record.

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

1.3 DELEGATED DESIGN

A. Performance and Design Criteria: where professional design services or certifications by a design professional are specifically required of the Contractor by the Contract

Documents, provide products and systems complying with specific performance and design criteria indicated.

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

1.4 SUBMITTALS

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

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

C. Contractor's Daily quality Control reports: the contractor shall designate an individual responsible for maintaining control over the quality of the work. For each day on which work is scheduled to be performed, the Contractor's Quality Control Representative shall prepare and submit certified written reports that include the following:

a. Date of report preparation and date work was performed.
b. Project title and number.
c. Name, address, and telephone number of testing agency.
d. Dates and locations of samples, tests, or inspections.
e. Names of individuals making tests and inspections.
f. Description of the work performed that day, and the reasons for non-work.
g. Item of work tested or inspected. Test and inspection methods.
h. Identification of products delivered/installed and corresponding specification sections.
i. Complete test or inspection data.
j. Test and inspection results and an interpretation of test results.
k. Weather conditions. Ambient conditions at time of sample taking, testing and inspecting.
l. Comments or professional opinion on whether tested or inspected work complies with the Contract Document requirements.
m. name and signature of Quality Control Representative, and laboratory inspector.
n. Recommendations on retesting and re-inspecting.

D. Permits, licenses, and certificates: for the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, documents, established for compliance with standards and regulations bearing on performance of the work.

1.5 QUALITY ASSURANCE

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

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

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

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

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

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

   a. Requirement for specialists shall not supersede building codes and similar regulations governing the work, nor interfere with local trade-union jurisdictional settlements and similar conventions.
   b. Testing Agency Qualifications: an agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in the types of tests and inspections to be performed.

1.6 QUALITY CONTROL

A. Owner Responsibilities: The Owner may engage a qualified testing agency to perform additional testing services.

a. The Owner will furnish the Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.
b. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to the Contractor, and the Contractor shall cover the expense of such retesting and re-inspection at no additional cost to the Owner.
c. The presence or absence of the Owner's inspector or testing agency does not relieve the Contractor of the sole responsibility for compliance with the Contract Documents.

B. Contractor Responsibilities: The Contractor is solely responsible for controlling the work to comply with the Contract Documents. Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.

a. Where testing or inspection services are not indicated the Owner's responsibility, engage a qualified testing agency to perform these quality-control services.
    i. The Contractor shall not employ the same entity engaged by the Owner, unless agreed to in writing by the Owner.
b. Notify the Owner's testing agencies, Inspector of Record, and Contractor's testing agencies at least forty-eight (48) hours in advance of time when work that requires testing or inspecting will be performed.
c. Where testing or inspection services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each testing or inspection service.
d. Testing and inspecting requested by the Contractor and not required by the Contract Documents are the Contractor's responsibility.

C. Special Tests and Inspections: The Contractor will engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction.

a. The testing agency will notify the Owner and the Contractor promptly of irregularities and deficiencies observed in the work during performance of its services.
b. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to the Owner with a copy to the Contractor and to authorities having jurisdiction.
c. Testing agency will submit a final report of special tests and inspections at substantial completion, which includes a list of unresolved deficiencies.
d. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
e. Testing agency will retest and re-inspect corrected work.

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

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

F. Testing Agency Responsibilities: cooperate with the Owner and the Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

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

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

   a. Access to the work.
   b. Incidental labor and facilities necessary to facilitate tests and inspections.
   c. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
   d. Facilities for storage and field-curing of test samples.
   e. Delivery of samples to testing agencies.
   f. Preliminary design mix proposed for use for material mixes that require control by testing agency.
   g. Security and protection for samples and for testing and inspecting equipment at the project site.

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

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

PART 2 PRODUCTS (not used)

PART 3 EXECUTION

3.1 REPAIR AND PROTECTION

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

   a. Provide materials and comply with installation requirements specified in other sections of these specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.

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

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

PART 4 MEASUREMENT AND PAYMENT (Not Used)

END OF SECTION 014500

SECTION 015000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The Contract Documents, Drawings and Individual Specification Sections; apply to this Section.

B. Related Sections:

a. Section 011000: Summary of Work.
b. Section 011400: Work Restrictions.

1.2 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.3 USE CHARGES

A. General: Installation, removal, and use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the Owner**,** the Design Professionals, occupants of the Project, testing agencies, and authorities having jurisdiction.

B. Sewer Service: Contractor is responsible for payment of sewer service use charges for sewer usage by all entities for construction operations.

C. Water Service: Contractor is responsible for payment of water service use charges for water used by all entities for construction operations.

D. Electric Power Service: Contractor is responsible for payment of electric power service use charges for electricity used by all entities for construction operations.

1.4 INFORMATIONAL SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel (if applicable).

B. Erosion and Sedimentation Control Plan: Show compliance with requirements of stormwater erosion and sediment control including Storm Water Pollution Prevention Plan (if applicable).

C. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage; including delivery, handling, and storage provisions for materials subject to water absorption or water damage, discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water damaged Work.

    a. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

D. Dust-Control and HVAC-Control Plan: For all enclosed construction activities, submit coordination drawing and narrative that indicates the dust-control and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:

    a. Locations of dust-control partitions at each phase of the work.
    b. HVAC system isolation schematic drawing.
    c. Location of proposed air filtration system discharge.
    d. Other dust-control measures.
    e. Waste management plan.

1.5 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations and requirements of authority having jurisdiction for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

C. Accessible Temporary Egress: Comply with applicable provisions in ADA-ABA Accessibility Guidelines and ANSI A117.1.

1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before the Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 PRODUCTS

2.1 MATERIALS

A. Chain-Link Fencing: Minimum 0.148-inch thick, galvanized steel, chain-link fabric fencing; minimum 8 feet high with galvanized steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts**,** with 1-5/8-inch OD top rails.

B. Portable Chain-Link Fencing: Minimum 0.148-inch thick, galvanized steel, chain-link fabric fencing; minimum 8 feet high with galvanized steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top and bottom rails. Provide galvanized steel bases for supporting posts.

C. Wood Enclosure Fence: Plywood, 8 feet high, framed with four 2-by-4-inch rails, with preservative-treated wood posts spaced not more than 8 feet apart.

D. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10 mils minimum thickness, with flame-spread rating of 15 or less per ASTM E 84.

E. Dust Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches.

F. Insulation: Un-faced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2 TEMPORARY FACILITIES

A. Field Offices (when required), General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Owner's-Use Field Office (when required): Of sufficient size to accommodate needs of the Owner and construction personnel office activities and to accommodate project meetings. Keep office clean and orderly. Furnish and equip offices as follows:

   a. Furniture required for the Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
   b. Conference room of sufficient size to accommodate meetings of 2**0** individuals. Provide electrical power service and 120-V ac duplex receptacles, with not less than 1 receptacle on each wall. Furnish room with conference table, chairs, and 4-foot square tack and marker boards.
   c. Drinking water and private toilet.
   d. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
   e. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.

C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

   a. Store combustible materials apart from building.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. HVAC Equipment: Unless the Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

a. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
b. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
c. Permanent HVAC System: If the Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return air grille in system and remove at end of construction.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

a. Arrange with utility company, the Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

a. Connect temporary sewers to municipal system as directed by authorities having jurisdiction. Obtain all required permits.

C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction. Obtain all required permits.

D. Water Service: Connect to the Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to the Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

E. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

    a. Toilets: Use of the Owner's existing toilet facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to the Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

F. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

G. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.

    a. Prior to commencing work, isolate the HVAC system in area where work is to be performed in accordance with approved coordination drawings.
        i. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
        ii. Maintain negative air pressure within work area using HEPA-equipped air filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
    b. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust containment devices.
    c. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

H. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

    a. Provide dehumidification systems to maintain the facilities RH when required to reduce substrate moisture levels to level required to allow installation or application of finishes per manufacturer’s requirements and recommendations.

I. Electric Power Service: Connect to the Owner's existing electric power service. Maintain equipment in a condition acceptable to the Owner. Obtain all required permits.

J. Electric Power Service: Provide electric power service and distribution system of sufficient size, number of phases, capacity, and power characteristics required for construction operations and testing of all installed equipment.

   a. Install electric power service underground, unless otherwise indicated.
   b. Connect temporary service to the Owner's existing power source, as directed by the Owner.

K. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

   a. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
   b. Install lighting for the Project identification sign.

L. Telephone Service: Provide temporary telephone service in Owner’s-use facilities for use by all construction personnel. Install two telephone lines for each field office.

   a. Provide additional telephone lines for the following:
      i. Provide a dedicated telephone line for each facsimile machine in each field office.
   b. At each telephone, post a list of important telephone numbers.
      i. Police and fire departments.
      ii. Ambulance service.
      iii. Contractor's home office.
      iv. Design Professional’s office.
      v. Testing Consultant’s offices.
      vi. Owner's office.
      vii. Principal subcontractors' field and home offices.
   c. Provide superintendent with cellular telephone for use when away from field office.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

   a. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
   b. Maintain support facilities until Substantial Completion inspection date is scheduled. Remove before Substantial Completion. Personnel remaining after

Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.

B. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.

    a. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
    b. Prepare subgrade and install sub-base and base for temporary roads and paved areas specified in Individual Specification Sections.
    c. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course.

C. Traffic Controls: Comply with requirements of authorities having jurisdiction.

    a. Protect existing site improvements to remain including curbs, pavement, and utilities.
    b. Maintain access for fire-fighting equipment and access to fire hydrants.

D. Parking: Provide temporary parking areas for construction personnel.

E. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain the Project site, excavations, and construction free of water.

    a. Dispose of rainwater in a lawful manner that will not result in flooding the Project or adjoining properties nor endanger permanent Work or temporary facilities.
    b. Remove snow and ice as required to minimize accumulations.

F. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.

    a. Identification Signs: Provide Project identification signs as specified in the Contract Documents.
    b. Temporary Signs: Provide other signs as required to inform public and individuals seeking entrance to the Project.
        i. Provide temporary, directional signs for construction personnel and visitors.
    c. Maintain and touchup signs so they are legible at all times.

G. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.

H. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

    a. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

I. Temporary Elevator Use: Use of elevators is not permitted.

J. Existing Elevator Use: Use of the Owner's existing elevators will be permitted, provided elevators are cleaned and maintained in a condition acceptable to the Owner. At Substantial Completion, restore elevators to condition existing before initial use, including replacing worn cables, guide shoes, and similar items of limited life.

    a. Do not load elevators beyond their rated weight capacity.
    b. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.

K. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.

L. Existing Stair Usage: Use of the Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to the Owner. At Substantial Completion, restore stairs to condition existing before initial use.

    a. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.

M. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

B. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to authorities having jurisdiction.

a. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
b. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

c. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from the project site during the course of the project.
d. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

C. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

D. Tree and Plant Protection: Install temporary fencing outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

E. Site Enclosure Fence: Before construction operations begin furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.

a. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
b. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to the Owner.

F. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.

G. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

H. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

I. Covered Walkway: Erect protective, covered walkway for passage of individuals through or adjacent to Project site. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction.

a. Construct covered walkways using scaffold or shoring framing.

b. Provide overhead decking, protective enclosure walls, handrails, barricades, warning signs, exit signs, lights, safe and well-drained walkways, and similar provisions for protection and safe passage.
c. Paint and maintain appearance of walkway for duration of the Work.

J. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weather-tight enclosure for building exterior.

a. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

K. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by the Owner from fumes and noise.

a. Construct dustproof partitions with fire rated gypsum wallboard with joints taped on occupied side, and fire-retardant plywood on construction operations side.
b. Where fire-resistance-rated temporary partitions are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
c. Insulate partitions to control noise transmission to occupied areas.
d. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
e. Protect air-handling equipment.
f. Provide walk-off mats at each entrance through temporary partition.

L. Fire Safety During Construction: Comply with all requirements identified herein as well as the more stringent requirements of the applicable codes (New York State Building and Fire Codes or New York City Building and Fire Codes).

a. No smoking: Smoking shall be prohibited throughout the project/construction site. “No Smoking” signs shall be conspicuously posted at all entrances and throughout the site.
b. The Contractor shall designate a Fire Prevention Program Superintendent/ Fire Safety Manager who shall be responsible for all fire safety efforts until completion and acceptance of the Work described in the Contract Documents that include but are not limited to the following:
    i. Prefire Plans. Develop in cooperation with the local Fire Chief and Fire Code Official. Any changes affecting the utilization of information contained in the plan shall result in notification to the local Fire Chief and Fire Code Official.
    ii. Training. Job site personnel shall be trained in fire safety practices and procedures and the proper use of fire protection equipment, including hand-held fire extinguishers, hose lines, fire alarm and sprinkler systems.
    iii. Fire Protection Devices. Fire protection and detection equipment shall be maintained and serviced.

iv. Hot Work Operations. Welding, cutting, open torches, torch-applied roof system activities, and other hot work operations shall be conducted under a permit system. A fire watch and fire extinguishers shall be provided.
v. Impairment of Fire Protection Systems. Coordinate planned, emergency or accidental impairments of fire protection systems to include tagging of impaired systems and notification of Fire Department, Alarm Company, Building Owner/Operator, and Contractors.
vi. Temporary Covering of Fire Protection Devices. Coverings placed on or over fire protection devices for protection from damage shall be immediately removed upon the completion of the Work in the room or area in which the devices are installed.

c. Provide readily accessible telephone service for fire calls at a location or locations approved by the Owner.
   i. The Contractor shall pay all costs thereof until completion and acceptance of the Work or as otherwise directed by the Owner.
   ii. Provide/post the street address of the construction site and the emergency telephone number of the Fire Department adjacent to the telephone.
d. Provide or maintain a Temporary or Permanent Standpipe system for Fire Department use in accordance with the following:
   i. Buildings subject to the New York State Building Code: In buildings that require a standpipe system, such standpipe shall be installed when the progress of construction reaches a height of 40 feet.
   ii. Buildings subject to the New York City Building Code: In buildings that require a standpipe system, such standpipe shall be installed when the progress of construction reaches a height of 75 feet. The standpipe shall be equipped with an air pressurized alarm system.
   iii. Buildings being demolished: An existing standpipe system shall be maintained in operation on all floors, starting one floor directly below the floor being demolished. The existing standpipe can be converted to a dry standpipe if freezing conditions exist.

3.5 MOISTURE AND MOLD CONTROL

A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:

   a. Protect porous materials from water damage.
   b. Protect stored and installed material from flowing or standing water.
   c. Keep porous and organic materials from coming into prolonged contact with concrete.
   d. Remove standing water from decks.
   e. Keep deck openings covered or dammed.

C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:

   a. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
   b. Keep interior spaces reasonably clean and protected from water damage.
   c. Periodically collect and remove waste containing cellulose or other organic matter.
   d. Discard or replace water-damaged material.

   e. Do not install material that is wet.
   f. Discard, replace or clean stored or installed material that begins to grow mold.
   g. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:

   a. Control moisture and humidity inside building by maintaining effective dry-in conditions.
   b. Use permanent HVAC system to control humidity.
   c. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
      i. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
      ii. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record daily readings over a forty-eight-hour period. Identify materials containing moisture levels higher than allowed. Report findings in writing to the Design Professional.
      iii. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.6 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.

a. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

a. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves right to take possession of the Project identification signs.
b. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
c. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 – Contract Closeout Requirements.

PART 3 EXECUTION (Not Used)

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A Measurement and payment for all work shall be in accordance with the contract BID SCHEDULE, refer to Section 004100 and actual work as field measured and verified. No payments will be made for materials on hand. All payments to be made following field verification of work.

END OF SECTION 015000

SECTION 015526
TEMPORARY TRAFFIC CONTROL

PART 1 GENERAL

1.1 DESCRIPTION

A. Work consists of furnishing traffic control devices and services for the control and protection of traffic through the area of construction in accordance with these specifications and in conformity with the details and at the locations shown on the approved Contractor's plans for Temporary Traffic Control or as established by the Engineer.

B. Traffic Flow to and through the project site shall be maintained at all times practical.

C. Temporary traffic control includes the preparation, by the Contractor, of detailed traffic control plans as required in this specification.

1.2 SUBMITTALS

A. Prior to beginning construction, the Contractor shall provide detailed plans, indicating the details of advanced warning signing required for the project and typical detour signing. Temporary Traffic Control plan must be approved by the Engineer prior to beginning construction activities requiring such facilities.

1.3 PERMITS

A. Contractor is responsible for obtaining and adhering to applicable encroachment permits from Trinity County Department of Transportation.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

A. There will be no interruption of traffic on adjacent and feeder roads to the residential and commercial usage by maintaining a minimum of one-way traffic.

B. No construction shall begin until all necessary traffic control signs and devices are installed by the Contractor and approved by the Engineer.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A Measurement and payment for all work shall be in accordance with the contract BID

SCHEDULE, refer to Section 004100 and actual work as field measured and verified. No payments will be made for this item.

END OF SECTION 015526

SECTION 017100
MOBILIZATION AND DE-MOBILIZATION

PART 1 GENERAL

1.1 DESCRIPTION

A. This section includes mobilization and demobilization to and from the jobsite.

PART 2 PRODUCTS (not used)

PART 3 EXECUTION

3.1 PREPARATION

A. Make arrangements to contact all public works departments prior to mobilizing to the job site and secure all necessary permits prior to performing work.

B. Notify Owner a minimum of forty-eight (48) hours in advance of mobilization to job site location.

C. Secure all required bonds and insurance and submit to the owner prior to mobilization.

D. The Contractor shall not mobilize until after the Owner has issued the Notice to Proceed.

3.2 MOBILIZATION

A. Move materials, equipment, and laborers as necessary to job site location with minimal disturbance. No separate payment will be made for subsequent mobilizations to the jobsite.

3.3 DE-MOBILIZATION

A. Remove all materials, equipment, laborers, solid waste and debris created by construction activities from job site location.

B. Maintain minimal disturbance to site upon departure.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A Measurement and payment for all work shall be in accordance with the contract BID SCHEDULE, refer to Section 004100 and actual work as field measured and verified. No payments will be made for materials on hand. All payments to be made following field verification of work.

END OF SECTION 017100

SECTION 017300
SEISMIC ANCHORAGE REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. The purpose of this section is to provide instructions relating to the design and construction of anchorage requirements for mechanical, and electrical requirements and components. It is required that these items be anchored to the facility in a manner whereby the overall reliability of the facility is not compromised.

B. The Contractor shall ensure that all equipment and materials shall be adequately anchored to the structure and restrained against seismic movement.

C. Contractors shall provide all anchorage required for the equipment or materials they are providing.

D. Piping and duct work shall be installed per "guidelines for seismic restraints of mechanical systems and plumbing/piping systems," published by SMACNA and PPIC.

1.2 SUBMITTALS

A. Submittal of the design and detail of anchorage is required for base-anchored equipment weighing 400 pounds or more and suspended equipment weighing 25 pounds or more.

B. Submit per Section 013300, Submittals, to the General Contractor and Project Coordinator.

C. Equipment anchorage details and substantiating data or calculations shall be submitted at the same time as the equipment submittals outlined in the other divisions. Anchorage submittal may be submitted after review and acceptance of equipment submittal if agreed upon by the Project Coordinator. Make the anchorage submittal a separate package for expediting the review.

D. Submittals shall include installation drawings, product data, and substantiating calculations.

E. Installation drawings shall show the following:

a. Plan and elevation dimensions of equipment, shown approximately to scale.
b. Equipment designation shown on contract documents.
c. Anchorage locations.
d. Anchorage size, type, or detail.
e. Weight of equipment.
f. Reference product data.

g. Concrete edge distance limit for drilled-in anchors.

F. Product data shall be current and items to be used shall be clearly marked. Capacities of items shall be shown with substantiating information.

G. Calculations shall include:

a. Equipment designation.
b. Equipment weight and plan and vertical elevation of the center of gravity.
c. Design criteria and material strengths.
d. Summary of the forces on anchors.
e. Verification of the capacity of items (i.e., ICBO reports or similar data).
f. Name and registration number of engineer responsible for the design.

H. Submittals shall be reviewed and accepted by the mechanical or electrical engineer, before being forwarded to the structural engineer for review.

1.3 QUALITY ASSURANCE

A. Inspection and testing of anchor bolts, grouted bolts, and drilled-in anchors, shall be per Special Inspection.

B. All connections requiring submittal shall be designed by a Registered Professional Engineer licensed in the State of California.

1.4 SYSTEM PERFORMANCE REQUIREMENTS

A. Design and installation shall meet the requirements of California Building Code, 2022 Edition.

B. Seismic design forces shall be based on ASCE7-22

C. Components attached to two different floor levels (or roof) shall consider a differential movement between levels of 1 inch in any horizontal direction. Attachments shall also consider a vertical differential movement of 3/4 inch up or down.

D. All connections to the structure shall be made in a rigid manner, except for units requiring special vibration isolation or differential movement.

E. Friction due to gravity loads shall not be used to resist seismic forces.

1.5 PROJECT CONDITIONS

A. No attachments for equipment, piping or duct work shall be made to the wood roof deck. Support these items from the structural beams or pre-manufactured joists. Secondary

members may be required to reach the structural members. These shall be shown on the submittals and supplied by the contractor installing the equipment.

B. See Structural drawings for details of anchoring to pre-manufactured joists. Coordinate locations of anchorage to joist with joist Shop Drawings. No hangers or added loads will be allowed in the field unless shown on shop drawings and included in design of joist.

C. All structural concrete is “hard rock” concrete with strength as shown on Structural General Notes.

D. Do not weld across the bottom flange of steel beams. Welding to webs of steel beams and columns is permitted.

E. Any holes in steel beams or columns required for bolting shall be submitted and reviewed by the structural engineer, prior to drilling holes in the field.

PART 2 PRODUCTS

2.1 DRILLED-IN CONCRETE ANCHORS

A. Acceptable drilled-in concrete anchors shall be Hilti “Kwik Bolt II by Hilti, Inc., or “Power-Bolt” by Powers/Rawl-Fastening, Inc. Minimum embedment depths shall be 8 bolt diameters unless otherwise noted.

B. Allowable loads shall use a safety factor of 4, applied to the ultimate rated capacities. No stress increase is allowed for seismic forces.

2.2 GROUTED BOLTS

A. See the Structural General Notes for epoxy adhesives to use for grouted bolts. Bolts shall be ASTM A307 material or better.

2.3 METAL FABRICATIONS

A. See Division 05.

2.4 OTHER PRODUCTS

A. As specified in other sections.

PART 3 EXECUTION

3.1 PREPARATION

A. Coordinate and furnish all required anchorage.

B. Notify inspection agency per the special inspection section.

3.2 INSTALLATION

A. Install anchors in strict accordance with the manufactures written literature of the item being installed. Alterations made in the field for fit up, shall be sketched on the installation drawing and submitted to the Project Coordinator for the structural engineer's review.

3.3 FIELD INSPECTION

A. See requirements of 014500.

END OF SECTION 017300

SECTION 017400
CLEANING AND WASTE MANAGEMENT

PART 1 GENERAL

1.1 SUMMARY

A. Includes administrative and procedural requirements for Cleaning and Waste Management as described in Contract Documents.

1.2 DESCRIPTION

A. Dispose of waste, debris, and rubbish resulting from the construction of the project.

B. If excess excavation spoils cannot be suitably disposed of on site, as directed by the Inspector, it shall be hauled away at the Contractor's expense.

1.3 CODES, ORDINANCES, AND REGULATIONS

A. Handle and dispose refuse in accordance with applicable Federal, State, County, City, and applicable laws and regulations.

PART 2 PRODUCTS (not used)

PART 3 EXECUTION

3.1 REQUIREMENTS

A. Remove waste materials, debris, and rubbish from the site and legally dispose of at a public or private dumping area(s) off of site property. Use of private disposal facilities will require prior authorization by the Owner and provision of a signed release of liability by the facility Owner/Representative for the project Owner.

B. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

a. Do not burn or bury rubbish and waste materials on the project site.
b. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
c. Do not dispose of wastes into streams or waterways.

3.2 PROGRESS CLEANING

A. Comply with regulations of authorities having jurisdiction and safety standards for cleaning.

B. Keep premises broom clean during progress of the Work.

C. During handling and installation, protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from soiling, damage, or deterioration until Substantial Completion.

D. Supervise construction activities to ensure that no part of construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.

E. Clean exposed surfaces and protect as necessary to avoid damage and deterioration.

F. Construction Waste Management and Disposal:

a. Remove waste materials and rubbish caused by employees, Subcontractors, and contractors under separate contract with Owner and dispose of legally.

b. Do not deposit waste into storm drains, sanitary sewers, streams, or waterways. Do not discharge volatile, harmful, or dangerous materials into drainage systems.

3.3 FINAL CLEANING

A. Immediately before Substantial Completion, thoroughly clean the area where The Work was performed.

B. Comply with individual manufacturer's cleaning instructions.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A Measurement and payment for all work shall be in accordance with the contract BID SCHEDULE, refer to Section 004100 and actual work as field measured and verified. No payments will be made for materials on hand. All payments to be made following field verification of work.

END OF SECTION 017400

SECTION 017800
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and Bonds.

1.02 RELATED REQUIREMENTS

A. Individual Product Sections: Specific requirements for operation and maintenance data.

B. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

   a. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
      i. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
   b. Advise Owner of pending insurance change-over requirements.
   c. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
   d. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
   e. Submit record drawings, maintenance manuals, final project photographs, damage or settlement survey, property survey, and similar final record information.
   f. Deliver tools, spare parts, extra stock, and similar items.
   g. Make final change-over of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of change-over in security provisions.
   h. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary

facilities from the site, along with construction tools, mock-ups, and similar elements.

i. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

B. Inspection Procedures: On receipt of a request for inspection, the Engineer will either proceed with inspection or advise the Contractor of unfilled requirements. The Engineer will prepare:

a. The Certificate of Substantial Completion following inspection, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
b. The Engineer will repeat inspection when requested and assured that the Work has been substantially completed.
c. Results of the completed inspection will form the basis of requirements for final acceptance.

C. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

a. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
b. Submit a certified copy of the Engineer's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance and the list has been endorsed and dated by the Engineer.
c. Submit consent of surety to final payment.

1.04 SUBMITTALS

A. Project Record Documents: Submit documents to Owner with claim for final Application for Payment.

B. Operation and Maintenance Data:

a. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Owner will review draft and return one copy with comments.
b. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within fourteen (14) calendar days after acceptance.
c. Submit one copy of completed documents fourteen (14) calendar days prior to final inspection. This copy will be reviewed and returned after final inspection, with Owner comments. Revise content of all document sets as required prior to final submission.

d. Submit two sets of revised final documents in final form within fourteen (14) calendar days after final inspection.

C. Warranties and Bonds:

a. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within fourteen (14) calendar days after acceptance.
b. Make other submittals within fourteen (14) calendar days after Date of Substantial Completion, prior to final Application for Payment.
c. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within fourteen (14) calendar days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:

a. Drawings.
b. Specifications.
c. Addenda.
d. Change Orders and other modifications to the Contract.
e. Reviewed shop drawings, product data, and samples.
f. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:

a. Changes made by Addenda, change order, substitution, and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:

a. Measured depths of foundations in relation to finish first floor datum.

b. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
c. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
d. Field changes of dimension and detail.
e. Details not on original Contract drawings.

3.2 OPERATION AND MAINTENANCE DATA

A. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.3 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:

a. Product data, with catalog number, size, composition, and color and texture designations.
b. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

3.4 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:

a. Description of unit or system, and component parts.
b. Identify function, normal operating characteristics, and limiting conditions.
c. Include performance curves, with engineering data and tests.
d. Complete nomenclature and model number of replaceable parts.

B. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

C. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

D. Provide servicing and lubrication schedule, and list of lubricants required.

E. Include manufacturer's printed operation and maintenance instructions.

F. Include sequence of operation by controls manufacturer.

G. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

H. Additional Requirements: As specified in individual product specification sections.

3.5 OPERATION AND MAINTENANCE MANUALS

A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

B. Prepare data in the form of an instructional manual.

C. Binders: Commercial quality, 8-1/2 by 11 inch (216 by 280 mm) three D side ring binders with durable plastic covers; 2 inch (50 mm) maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

E. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.

F. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:

   a. Part 1: Directory, listing names, addresses, and telephone numbers of Owner, Contractor, Subcontractors, and major equipment suppliers.
   b. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      i. Significant design criteria.
      ii. List of equipment.
      iii. Parts list for each component.
      iv. Operating instructions.

v. Maintenance instructions for equipment and systems.
vi. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.

c. Part 3: Project documents and certificates, including the following:
i. Shop drawings and product data.

3.6 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within fourteen (14) calendar days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

E. Include originals of each in operation and maintenance manuals, indexed separately on Table of Contents.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A Measurement and payment for all work shall be in accordance with the contract BID SCHEDULE, refer to Section 004100 and actual work as field measured and verified. No payments will be made for materials on hand. All payments to be made following field verification of work.

END OF SECTION 017800

DIVISION 02
EXISTING CONDITIONS

SECTION 022100
SURVEY CONSTRUCTION STAKING

PART 1 GENERAL

1.1 DESCRIPTION

A. The work to be done under this section shall be by an agent of the Owner and shall consist of furnishing and setting construction stakes and marks by the Owner to establish the lines and grades required for completion of the work as shown on the plans and specified in the project specifications.

PART 2 PRODUCTS (not used)

PART 3 EXECUTION

3.1 GENERAL

A. Construction staking shall be performed under the direction of a licensed land surveyor or registered professional engineer familiar with construction surveying and staking.

B. Construction staking shall be performed as necessary to control the work. Construction stakes and marks shall be furnished and set with accuracy adequate to assure that the completed work conforms to the lines, grades, and sections shown on the plans. The Contractor shall provide a construction staking request in writing to Owner or its agent at least seventy-two (72) hours prior to the desired time for construction staking to be performed.

C. In the event the Contractor's operations destroy any of the Owner's survey control points, the Contractor shall either replace such control points at his expense, subject to verification by the Engineer, or request the Owner to replace the destroyed control points. If requested to replace the control points, the Owner will do so within fourteen (14) calendar days. The cost of any such verification or replacement of the control surveys will be the sole responsibility of the Contractor with no additional cost to the Owner. The Contractor will not be allowed any adjustment in contract time for such verification or replacement of survey control points by the Inspector.

D. Construction stakes shall be removed from the site of the work when no longer needed.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A. Owner is to provide construction staking including benchmarks and layout. No payment will be made to the Contractor for these items.

END SECTION 022100

SECTION 024000
DEMOLITION

PART 1 GENERAL

1.1 Description

A. Includes demolition of existing developments, facilities, and improvements as required to accommodate new construction. Also includes supplementary clearing and grubbing requirements.

PART 2 PRODUCTS (not used)

PART 3 EXECUTION

3.1 Infrastructure Removal

A. Existing infrastructure, developments, and site improvements scheduled for removal must be addressed in strict compliance with applicable laws and regulations.

B. Contractor to secure authorized facility(ies) for disposal of generated rubble and demolition debris. Facility authorization must be submitted to the Owner and approved for use prior to beginning work.

C. Dust and other airborne particles generated by demolition activities must be controlled and reduced to acceptable air quality levels. Airborne particle retardant practices in strict accordance with erosion and pollution requirements are to be administered.

D. Noise pollution is to be minimized during demolition activities. Excessive noise generating activities are to be scheduled between 0900 and 1600 hours, Monday through Friday to reduce the potential impact to adjacent property owners and occupants.

3.2 Protection

A. Locate, identify, and protect existing facilities (scheduled to remain) from damage.

B. Identify and protect trees, plant growth, and features designated to remain as final landscaping.

C. Protect benchmarks from damage and displacement.

3.2 Clearing

A. Clear only those areas required for access to site and execution of Work as depicted in construction plans and described in scope of work.

3.3 Removal

A. Remove paving, brush, trees, and other debris as required and dispose of off-site in strict accordance with applicable laws and regulations and only at facilities approved and authorized for such disposal.

END OF SECTION 024000

SECTION 024200
DEWATERING

PART 1 GENERAL

1.1 SUMMARY

A. This section includes construction dewatering.

1.2 PERFORMANCE REQUIREMENTS

A. Dewatering Performance: design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control flow into excavations and permit construction to proceed on dry, stable sub-grades.

1.3 SUBMITTALS

A. Shop Drawings for Information: for dewatering system. Show arrangement, locations, and details of wells and well points; locations of headers and discharge lines; and means of discharge and disposal of water.

a. Include shop drawings signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements: comply with water disposal requirements of authorities having jurisdiction.

1.5 CODES, ORDINANCES, AND REGULATIONS

A. Do all work and install materials and/or equipment in accordance with the requirements of the applicable Federal, State, County, City, and applicable laws and ordinances having jurisdiction.

PART 2 PRODUCTS (not used)

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 dewatering operations.

a. Include shop drawings signed and sealed by the qualified professional engineer responsible for their preparation.

b. Protect sub-grades and foundation soils from softening and damage by rain or water accumulation.

3.2 INSTALLATION

A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.

B. Before excavating below groundwater level, place system into operation to lower water to specified levels. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed, or until dewatering is no longer required.

C. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry sub-grades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of the foundations, drains, sewers, and other excavations.

a. Do not permit open sump pumping that leads to loss of fines, soil piping, sub-grade softening, or slope instability.

D. Reduce hydrostatic head in water-bearing strata below sub-grade elevations of foundations, drains, sewers, and other excavations.

a. Maintain piezometric water level a minimum of twenty-four (24) inches below surface of excavation.

E. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water in a manner that avoids inconvenience to others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.

F. Provide standby equipment on-site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to the Owner.

a. Remove dewatering system from project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of thirty-six (36) inches below overlying construction

G. Damages: promptly repair damages to adjacent facilities caused by dewatering operations.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A Measurement and payment for all work shall be in accordance with the contract BID SCHEDULE, refer to Section 004100 and actual work as field measured and verified. No payments will be made for materials on hand. All payments to be made following field verification of work.

END OF SECTION 024200

DIVISION 03
CONCRETE

SECTION 032000
CONCRETE REINFORCING

PART 1 GENERAL

1.1 SUMMARY

A. Related Documents:
   1. Drawings and general provisions of the Subcontract apply to this Section.
   2. Review these documents for coordination with additional requirements and information that apply to work under this Section.

B. Section Includes: Concrete reinforcement and accessories.

C. Related Sections:
   1. Division 01 Section "General Requirements."
   2. Division 01 Section "Special Procedures."

1.2 REFERENCES

A. General:
   1. The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.
   2. Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.
   3. Refer to Division 01 Section "General Requirements" for the list of applicable regulatory requirements.

B. ACI – American Concrete Institute:
   1. ACI 117 Tolerances for Concrete Construction
   2. ACI 301 Specifications for Structural Concrete
   3. ACI 315 Standard Practice for Detailing Reinforced Concrete Structures

C. ASTM International:
   1. ASTM A185 / A185M Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete
   2. ASTM A615 / A615M Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
   3. ASTM A706 / A706M Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
   4. ASTM A970 / A970M Standard Specification for Headed Steel Bars for Concrete Reinforcement

D. CRSI - Manual of Standard Practice.

E. ICBO - Evaluation Reports.

1.3 SUBMITTALS

A. Submit under provisions of Division 01 Section "General Requirements."

B. Shop Drawings: Prepare placing drawings in accordance with ACI 315. Show size, shape and location of bars and wire fabric in structure. Show splice locations and lengths. Where details are not shown, conform to standards of practice indicated in ACI 315 and submit for approval.
   1. Bill reinforcing bars for walls on elevations. Bill reinforcing bars for slabs on plans. Plans and elevations need not be true views. When more than one wall or slab are identical, only one such wall or slab is required. Take sections to clarify the arrangement of reinforcement. Identify, but do not bill bars on sections.
   2. Unless the location of reinforcing is clear, give dimensions to some structural feature that will be readily distinguishable at time bars are placed.
   3. Make placing drawings complete, including the location of support bars and chairs, without reference to the design drawings.

C. Submit data required to evaluate proposed mechanical splices.

D. Submit manufacturer's certified mill test reports on each heat of reinforcing steel delivered, showing physical and chemical analysis before placing reinforcement.

1.4 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of ACI 301 CRSI's "Manual of Standard Practice", except where more stringent requirements are shown or specified.

B. Requirements of Regulatory Agencies: Proprietary products, including bar couplers, shall have an active ICBO Evaluation Report.

C. Material Quality Assurance: Mill test reports including chemical analysis, tensile properties and bend test shall be examined for all reinforcing. Conform to one of the following:

D. Maintain positive identification of reinforcing by heat number. Provide certified mill test reports to Testing Laboratory.

E. Where positive identification cannot be made and procedures are not deemed adequate to ensure compliance, Testing Laboratory will randomly sample and make one tensile and one bend test from each 2-1/2 tons or fraction thereof of each size of reinforcement. Subcontractor will bear the cost of testing.

PART 2 PRODUCTS

1.5 REINFORCING MATERIALS

A. Bar Reinforcement: ASTM A615, Grade 60, deformed billet bars.
   1. ASTM A706, where noted on Drawings.
   2. Recycled content shall be a minimum of 75 percent recycled post-consumer steel.

B. Headed Bar Reinforcement: ASTM A970.

C. Spirals: ASTM A82.

D. Welded Wire Fabric: ASTM A185.

E. Threaded Bars: Grade 75, manufactured by DYWIDAY Systems International, Williams Form Engineering Corp. or equal substituted per Division 1.

F. Smooth Dowels, ASTM A615, Grade 40 or 60, smooth; sawcut or grind one end to remove offsets; shop paint with iron oxide zinc chromate primer.

G. Welded Deformed Bar Anchors: ASTM A-108 f_y = 70,000 psi, flux-filled deformed bar anchors welded to structural steel as shown; Nelson D2L, or equal substituted per Division 1.

H. Mechanical Bar Couplers: Provide mechanical couplers with a current ICC evaluation report. Coupler to develop 160% percent of specified minimum yield strength of spliced reinforcement. Subject to compliance with requirements provide one of the following, or approved equal:
   1. Barteck, Dextra Inc.
   2. Lenton Taper Threaded Connection, Erico Inc.
   3. Bar Lock, Dayton Superior Inc.

1.6 ACCESSORIES

A. Tie Wire: Minimum 16-gage black annealed wire.

B. Bar Supports:
   1. At surfaces not exposed to view in completed structure: Precast concrete bar supports with two 16 ga. embedded wires or CRSI Class 2 wire supports.
   2. Supports placed against ground or on top of vapor barrier: Precast concrete blocks not less than 3 inches square (1935 mm²) with two 16 ga. embedded wires.
   3. At Architectural Concrete and surfaces exposed to weather: CRSI Class 2 stainless steel or CRSI Class 1 plastic protected.
   4. Where support is no closer to concrete surface than 1/2 inch (13 mm): CRSI Class 3 wire supports.

1.7 FABRICATION

A. Fabricate reinforcement in accordance with ACI 315 where specific details are not shown.

PART 3 EXECUTION

1.8 PLACEMENT

A. Surface Condition of Reinforcement: Before placing concrete, clean reinforcement of loose scale, dirt, grease and other substances which would impair bond with concrete.

B. Place reinforcement in accordance with the Drawings and the CRSI Manual.
   1. Steel bars shall be of size and length indicated, accurately bent or formed to shapes detailed or scheduled by experienced shops by methods that will not injure the materials. Reinforcing bars shall be shop fabricated to lengths and bends shown on the drawings. Fabrication tolerance shall be in accordance with the requirements of ACI 315.
   2. Reinforcing bars shall be as long as possible with a minimum number of joints.
   3. Steel reinforcement shall not be bent or straightened in a manner that will injure the material or the embedding concrete. Bars with kinks or bends not shown on the Drawings shall not be used. Heating of reinforcement for bending will not be permitted.
   4. Reinforcement shall be tagged with suitable identification to facilitate sorting and placing.

C. Place reinforcing bars accurately as to spacing and clearance and securely tied at intersections and supports with wire and in such a manner as will preclude displacement during pouring of concrete. Placing tolerances shall be in conformance with the requirements of ACI 117.

D. Place and secure reinforcement to maintain the proper distance and clearance between parallel bars and from the forms. Provide vertical steel with metal spreaders to maintain steel properly centered in the forms. Horizontal reinforcement shall be supported at proper height on concrete pads, chairs or transverse steel bars.

E. After placing, maintain bars in a clean condition until completely embedded in concrete.

F. Bars shall not be spaced closer than 1-1/2 diameters of the largest of two adjacent bars, 1-1/2 times the maximum aggregate size, nor one inch, except at bar laps. Where reinforcement in members is placed in two layers, the clear distance between layers shall be not less than one inch (25 mm) or more than 1-1/2 inches (13 mm) unless otherwise noted on the drawings. The bars in the upper layer shall be placed directly above those in the bottom layer unless otherwise detailed.

G. Coverage of bars shall be as shown and scheduled. Conform to ACI 301 where not indicated.

H. Where obstruction prevents the intended placement of reinforcement, provide additional reinforcement as directed by the Owner around the obstruction.

I. Splice bars as indicated by lapping and securely wiring together. Splices at locations other than those indicated are subject to the approval of the Owner. Splices of

reinforcement shall not be made at the point of maximum stress. Splices shall provide sufficient lap to transfer the stress between bars by bond and shear. Bars shall be spread the minimum distance specified. Stagger splices of adjacent bars where possible.

J. Reinforcing bars shall not have welded joints.

K. Mechanical Bar Couplers: Install in accordance with applicable ICC evaluation report. Maintain clearance and coverage at coupler. Stagger couplers wherever practical.

1.9 FIELD INSPECTION

A. Owner's Inspector will:
   1. Review Quality Assurance procedures for maintaining identification of steel. Collect certificates of compliance and test reports for reinforcing steel.
   2. Special Inspect placement of reinforcement for conformance with the Contract Documents and as required by CBC Chapter 17.
   3. Special Inspect installation of mechanical couplers in accordance with requirements of applicable ICC evaluation report.
   4. Special Inspect shop and field welding as required by CBC Chapter 17

END OF SECTION 032000

SECTION 033000
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 DESCRIPTION

A. This section specifies Cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.2 SUBMITTALS

A. Refer to the Special Provisions and section 013300 for additional submittal guidelines. Before any equipment and/or material is fabricated or shipped, furnish to the Engineer full details, shop drawings, dimensions, catalog cuts, schematic (elementary) diagrams, and other descriptive matter as required to fully describe the equipment and/or material specified under the Section.

B. Product Data: for each type of product indicated.

C. Design Mixtures: for each concrete mixture.

D. Shop Drawings: For steel reinforcement.

E. Material test reports.

1.3 QUALITY ASSURANCE

A. Single-Source Responsibility: Obtain major materials, products, equipment, and system components, from one source from a single manufacturer.

B. Manufacturer Qualifications: a firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

   a. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities".

C. ACI Publications: comply with the following unless modified by requirements in the Contract Documents:

   a. ACI 301: "Specification for Structural Concrete," Sections 1 through 5.
   b. ACI 117: "Specifications for Tolerances for Concrete Construction and materials".

D. Pre-installation conference: conduct a conference at the project site.

1.5 CODES, ORDINANCES, AND REGULATIONS

A. Do all work and install materials and/or equipment in accordance with the requirements of the applicable Federal, State, County, City, and applicable laws and ordinances having jurisdiction.

1.4 MEASUREMENT

A. Measurement and payment are per bid schedule Section 004100.

1.5 RELATED SECTIONS

A. Divisions 31, 32, and 33.

1.6 REFERENCES

A. ACI 304: Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.

B. ASTM C94: Ready-Mixed Concrete.

PART 2 PRODUCTS

2.1 GENERAL

A. Unless otherwise indicated, provide all first-quality new materials, free from any defects, and suitable for the intended use and the space provided. Provide materials approved by UL wherever standards have been established by that organization.

B. Furnish and install all incidental items not specifically shown or specified which are required by good practice to provide the complete systems specified herein.

C. Where two or more units of the same class of material or equipment are required, provide products of a single manufacturer. Component parts of materials or equipment need not be products of the same manufacturer.

2.2 FORM-FACING MATERIALS

A. Smooth-formed finished concrete: form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize the number of joints.

B. Rough-formed finished concrete: plywood, lumber, metal, or other approved materials. Provide lumber dressed on at least two edges and one side for tight fit.

2.3 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M. Grade 60 (grade 420), deformed.

B. Galvanized-steel welded wire reinforcement: ASTM A 185, plain, fabricated from galvanized steel wire into flat sheets.

C. 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 pre-cast concrete according to CRSI's "Manual of Standard Practice".

2.4 CONCRETE MATERIALS

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

   a. Portland Cement: ASTM C150, Type III

B. Normal-weight aggregates: ASTM C33, graded, ¾ inch (19 mm) nominal maximum coarse-aggregate size.

   a. Fine and Coarse Aggregates: free of materials with deleterious reactivity to alkali in cement.

C. Water: Clean (not detrimental to concrete). ASTM C94/C94M and potable.

2.5 ADMIXTURES

A. Air Entrainment: ASTM C260.

B. Chemical Admixtures: provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

   a. Water reducing admixture: ASTM C494C494M, Type A.
   b. Retarding admixture: ASTM C494/C494M, Type B.
   c. Water reducing and retarding admixture: ASTM C494/C494M, Type D.
   d. High range, water reducing admixture: ASTM C494/C494M, Type F.
   e. High range, water reducing and retarding admixture: ASTM C494/C494M, Type G.
   f. Plasticizing and retarding admixture: ASTM C1017/C1017M, Type II.

2.6 VAPOR RETARDERS

A. Plastic vapor retarder: ASTM E 1745, Class C, or polyethylene sheet, ASTM D 4397 not less than 6 mil thick. Include manufacturer's recommended adhesive or pressure-sensitive joint

tape.

B. Joint seams to overlap a minimum of twelve inches and be secured in place with manufacturer recommended and Owner approved joint tape.

2.7 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. (305 g/sq. m) 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, non-dissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.

F. Clear, waterborne, membrane-forming curing compound: ASTM C 309, Type 1, Class B, non-dissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.

G. Clear, solvent-borne, membrane-forming curing and sealing compound: ASTM C 1315, Type 1, Class A.

H. Clear, waterborne, membrane-forming curing and sealing compound: ASTM C 1315, Type 1, Class A.

2.8 RELATED MATERIALS

A. Expansion and isolation joint filler strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.

2.9 CONCRETE MIXTURES

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

B. Provide concrete to the following criteria:

a. Minimum compressive strength: 2500 psi at 28 days.
b. Maximum water-cementitious materials ratio: 0.45.

c. Slump limit: 4 inches (100 mm) for concrete with verified slump of 2 to 4 inches (50 to 100 mm) before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch (25 mm).
d. Air content: 6 percent, plus or minus 1.5 percent at point of delivery for ¾ inch (19 mm) nominal maximum aggregate size.

2.10 CONCRETE MIXING

A. Ready mix concrete: measure, batch, mix, and deliver concrete according to ASTM C94/C94M, and furnish batch ticket information.

a. When air temperature is between 85- and 90-degrees F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

2.11 FABRICATING REINFORCEMENT

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

PART 3 EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork according to ACI 301 to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.3 VAPOR RETARDERS

A. Plastic vapor retarders: place, protect, and repair vapor retarders according to ASTM E 1643 and manufacturer's written instructions.

a. Lab joints twelve inches minimum and seal with manufacturer's recommended tape.
b. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.4 STEEL REINFORCEMENT

A. General: comply with CRSI's "Manual of Standard Practice" for placing 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 or as approved by the Engineer.

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:

   a. Grooved joints: form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
   b. Sawed joints: form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8 inch (3.2 mm) wide joints into concrete when cutting action will 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.

3.6 EXAMINATION

A. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed and positioned securely and will not cause hardship in placing concrete.

3.7 PREPARATION

A. Thoroughly compact concrete bearing area to a minimum depth of 6 inches. Compaction shall be a minimum of ninety-five percent (95%) relative compaction beneath all foundations.

3.7 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be 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.

a. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

C. Cold-weather placement: comply with ACI 306.1.

D. Hot-weather placement: comply with ACI 301.

3.8 FINISHING FORMED SURFACES

A. Rough-formed finish: as cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

a. Apply to concrete surfaces.

B. Smooth-formed finish: as cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

a. Apply to concrete surfaces exposed to public view.

C. 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.

3.9 FINISHING FLOORS AND SLABS

A. General: comply with ACI 302.1R recommendations for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Float finish: consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Rte-straighten, cut down high spots, and fill low spots. Repeat float passes and re-straightening until surface is left with a uniform, smooth, granular texture.

a. Apply a trowel finish to surfaces indicated.
b. Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10 foot (3.05 m) long straightedge resting on 2 high spots and placed anywhere on the surface does not exceed ¼ inch (6 mm).

C. Trowel finish: after applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and re-straighten until surface is

free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

D. Trowel and fine-broom finish: apply a first trowel finish to surfaces indicated. While concrete is still plastic, slightly scarify surface with a fine broom.

   a. Comply with flatness and levelness tolerances for trowel finished floor surfaces.

E. Broom finish: apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

3.10 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 (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

   a. Moisture curing: keep surfaces continuously moist for not less than seven days.
   b. Moisture-retaining-cover curing: cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
   c. Curing compound: apply uniformly in continuous operation by power spray or heavy rainfall within three hours after initial application maintain continuity of coating and repair damage during curing period.
      i. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.
   d. Curing and sealing compound: apply uniformly to floors and slabs indicated in a 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. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.11 FIELD QUALITY CONTROL

A. Testing and inspection: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

a. Testing services: tests shall be performed according to ACI 301.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A. Measurement and payment for all work shall be in accordance with the contract BID SCHEDULE, refer to Section 004100 and actual work as field measured and verified. No payments will be made for materials on hand. All payments to be made following field verification of work.

END OF SECTION 033000

DIVISIONS 04-08
-NOT USED-

DIVISIONS 09
FINISHES

SECTION 099100
PAINTING

PART 1 GENERAL

1.1 FIELD QUALITY CONTROL

A. Request review of first finished room, space, or trim of each color scheme required by the Project Coordinator for color, texture, and workmanship. Lighting type and intensity shall match lighting of finished work.
B. If approved, sample area will serve as a minimum standard for work throughout the project.

1.2 SUBMITTALS

A. Submit product data under provisions of Section 013300.
B. Prepare three 8x10 inch samples of all finishes. When possible, apply finishes on identical type materials to which they will be applied on job.
C. Identify each sample as to finish, formula, color name and number, and sheen name.
D. Final color acceptance will not occur until after Project Coordinator’s review of field samples.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Deliver paint materials in sealed original labeled containers, bearing manufacturer's name, type of paint, brand name, color designation, and instructions for mixing and/or reducing.
B. Provide adequate storage facilities. Store paint materials per manufacturer requirements or at minimum ambient temperature of 45 degrees Fahrenheit (in absence of manufacturer recommendation) in well ventilated area.
C. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.4 ENVIRONMENTAL REQUIREMENTS

A. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture contents of surfaces are below the maximums established by the manufacturer for each type of coating.
B. Ensure temperature of or on the substrate or the temperature of the air in the vicinity of the painting work is above forty (40) degrees Fahrenheit. Interior latex paints shall not be applied below forty-five (45) degrees Fahrenheit unless so authorized in writing by the manufacturer. Epoxy paints and other special resin coatings shall not be applied below seventy (70) degrees Fahrenheit unless otherwise noted on the manufacturer's printed instructions.
C. Provide adequate continuous ventilation and sufficient heating facilities to maintain temperatures above forty-five (45) degrees Fahrenheit for twenty-four (24) hours before, during, and forty-eight (48) hours after application of finishes.
D. Provide minimum twenty-five (25) foot candles of lighting on surfaces to be finished.

1.5 EXTRA STOCK

A. Leave on premises, where directed by the Owner, not less than five (5) gallons of each color used.

B. Containers to be tightly sealed and clearly labeled for identification.
C. Provide Owner with formulas for future duplication.

1.6 FIELD SAMPLES
A. Provide samples (prior to mixing the entire job) under provisions of Section 013300.
B. Provide a twenty (20) foot hall field sample panel for each hall wall color; full height, illustrating installed color, texture, and finish. Include painting of door frames.
C. Provide complete field sample of one room, include accent paint.
D. Locate where directed.
E. Accepted sample may remain as part of the Work.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS
A. Subject to compliance with requirements of the Contract Documents and provided the manufacturer meets the standards established by the specifically listed product, manufacturers offering products which can be incorporated in the work include, but are not limited to those identified in this section or indicated on the drawings, provided substitution prior approval, in accordance with Instructions to Bidders, was given.
B. Substitutions under provisions of Section 012500.
C. Standards established by a specifically listed product shall include but not be limited to visual matching. The final judgment whether a product proposed by the Factory/Engineering Firm, visually matches the specified product satisfactorily will be determined by the Engineer.

2.2 MATERIALS
A. Paint and Coatings: Type and brand listed herein.
B. Paint Accessory Materials: (Linseed oil, shellac, turpentine and other materials not specifically indicated herein but required to achieve the finishes specified) of high quality and approved manufacturer.
C. Paints: Ready-mixed except field catalyzed coatings. Pigments fully ground maintaining a soft paste consistency, capable of readily and uniformly dispersing to a complete homogeneous mixture.
D. Paints to have good flowing and brushing properties and be capable of drying or curing free of streaks or sags.
E. Paint sheen shall fall within the following gloss ranges when tested in accordance with ASTM D-523, 60 degree gloss meter: Flat below 15, Eggshell 15 to 20, Satin 15-35, Semi-Gloss 30-65, Gloss over 65.

PART 3 EXECUTION

3.1 INSPECTION
A. Thoroughly examine surfaces scheduled to be painted prior to commencement of work. Report in writing to the General Contractor and Project Coordinator any condition that may potentially affect proper application. Do not commence work until such defects have been corrected.

B. Correct defects and deficiencies in surfaces which may adversely affect work of this Section.

3.2 PROTECTION

A. Adequately protect other surfaces from paint and damage. Repair damage as a result of inadequate or unsuitable protection.
B. Furnish sufficient drop cloths, shields, and protective equipment to prevent spray or droppings from fouling surfaces not being painted.
C. Place cotton waste, cloths, and material which may constitute a fire hazard in closed metal containers and remove daily from site.
D. Remove electrical plates, surface hardware, fittings and fastenings, prior to painting operations. These items are to be carefully stored, cleaned, and replaced on completion of work in each area. Do not use solvents to clean hardware that may remove permanent lacquer finish.
E. Protect labels on fire rated doors and frames.

3.3 PREPARATION

A. Remove mildew, by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry completely.
B. Remove surface contamination from aluminum surfaces requiring a paint finish by steam, high pressure water, or solvent washing. Apply etching primer or acid etch. Apply paint immediately if acid etching.
C. Remove contamination, acid etch, and rinse new concrete floors with clear water. Ensure required acid-alkali balance is achieved. Allow to thoroughly dry.
D. Remove contamination from gypsum board surfaces and prime to show defects, if any. Paint after defects have been remedied.
E. Remove surface contamination and oils from galvanized surfaces and wash with solvent. Apply coat of etching type primer. Touch up factory hot-dipped finish to eliminate defects.
F. Remove surface contamination and oils from zinc coated surfaces and prepare for priming in accordance with metal manufacturer's recommendations.
G. Remove dirt, loose mortar, scale, powder, and other foreign matter from concrete and concrete block surfaces which are to be painted or to receive a clear seal. Remove oil and grease with a solution of trisodium phosphate, rinse well and allow to thoroughly dry.
H. Remove stains from concrete and concrete block surfaces caused by weathering of corroding metals with a solution of sodium metasilicate after being thoroughly wetted with water. Allow to thoroughly dry.
I. Fill hairline cracks, small holes, and imperfections on plaster surfaces with patching plaster. Smooth off to match adjacent surfaces. Wash and neutralize high alkali surfaces where they occur.
J. Remove grease, rust, scale, dirt, and dust from steel and iron surfaces. Where heavy coatings of scale are evident, remove by wire brushing, sandblasting, or any other necessary method. Ensure steel surfaces are satisfactory before paint finishing.
K. Clean unprimed steel surfaces by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts and nuts are similarly cleaned. Prime surfaces to indicate defects, if any. Paint after defects have been remedied.

L. Sand and scrape shop primed steel surfaces to remove loose primer and rust. Feather out edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.
M. Sand runs and drips from shop primed surfaces. Feather out edges and re-prime to provide a smooth surface.
N. Wipe off dust and grit from miscellaneous wood items and millwork prior to priming. Spot coat knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried and sand between coats. Back prime interior and exterior woodwork.

3.4 APPLICATIONS

A. Apply each coat at proper consistency and in strict accordance with manufacturer's instructions.
B. Each coat of paint is to be slightly darker than the preceding coat.
C. Sand lightly between coats as required to achieve specified finish.
D. Do not apply finishes on surfaces that are not sufficiently dry.
E. Allow each coat of finish to dry before applying the following coat, unless directed otherwise by the manufacturer.
F. Where clear finishes are required, ensure tint fillers match wood. Work fillers well into the grain before set. Wipe excess from the surface.
G. Back-prime interior and exterior woodwork, which is to receive stain and/or varnish finish, with gloss varnish reduced twenty-five (25) percent with mineral spirits.
H. Prime top and bottom edges of wood and metal doors with enamel undercoat when they are to be painted.
I. Prime top and bottom edges of wood doors with gloss varnish when they are to receive a stain or clear finish.
J. Spray apply interior and exterior metals to provide a smooth surface void of sags and runs.
K. Recoat as required to eliminate holidays and provide full uniform coverage at no cost to the Owner.
L. At intersection of different colors/sheens, provide straight, crisp cut in.

3.5 MECHANICAL AND ELECTRICAL EQUIPMENT

A. Refer to mechanical and electrical sections with respect to painting and finishing requirements, color coding, and identification banding of equipment, ducting, piping and conduit. Mechanical and electrical Contractors are responsible for painting as outlined in their respective sections.
B. All exposed-to-view grilles, covers and access panels shall be painted to match adjacent surfaces. Remove grilles, covers, and access panels for mechanical and electrical systems from location and paint separately.
C. Paint exposed-to-view interior surfaces of air ducts, behind louvers, and grilles.
D. Finish paint primed equipment to color selected.
E. Prime and paint insulated and bare pipes, conduits, boxes, hangers, brackets, collars and supports, except where items are plated or covered with a pre-finished coating.
F. Replace identification markings on mechanical or electrical equipment when painted over or splattered.

G. Paint exposed conduit and electrical cabinets occurring in finished areas except fire alarm panels. Color and texture to match adjacent surfaces.
H. Paint both sides and edges of plywood backboards for electrical equipment before installing backboards and mounting equipment on them.
I. Color code equipment, piping, conduit and exposed ductwork in accordance with requirements indicated. Color banding and identification (flow arrows, naming, numbering, etc.).
J. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.6 CLEANING

A. As work proceeds and upon completion, promptly remove paint where spilled, splashed, or splattered.
B. During progress of work keep premises free from any unnecessary accumulation of tools, equipment, surplus materials, and debris.
C. Upon completion of work leave premises neat and clean, to the satisfaction of the General Contractor.

3.7 PAINTING AND FINISH SCHEDULE (All colors are custom as selected by the Project Coordinator)

A. Interior Wood – Cedar/Pine
   1. Finish – two (2) coats Fast Dry Sanding Sealer.
   2. Finish – two (2) coats Fast Dry Oil Varnish - Satin.
B. Interior Wood Veneer – Cedar/Pine
   1. Semitransparent or solid color stain with oil varnish overcoat, three (3) different colors as approved by the Project Coordinator.
C. Interior Wood – Hardwood
   1. Two (2) coats Stain
   2. Two (2) coats Fast Dry Sanding Sealer.
   3. Two (2) coats Fast Dry Oil Varnish – Gloss.
   4. Two (2) coats Fast Dry Varnish – Satin.
D. Drywall (refer to Room Finish Schedule, paint type Eggshell)
   1. Primer finish – one (1) coat latex mold and mildew prevention, commercial grade.
   2. Paint finish – two (2) coats low odor acrylic, commercial grade.
E. Drywall (refer to Finish Schedule, paint type Semi-Gloss)
   1. Primer finish – one (1) coat latex mold and mildew prevention, commercial grade.
   2. Paint finish – two (2) coats low odor acrylic, commercial grade.
F. Drywall (refer to Room Finish Schedule, paint type Epoxy)
   1. Primer finish – one (1) coat latex mold and mildew prevention, commercial grade.
   2. Paint finish – two (2) coats Water based Catalyzed epoxy.
G. Miscellaneous Interior Metals and Metal Fabrications: (Hollow metal frames, doors, electrical panel doors, metal fabrications, mechanical grilles, access panels, ladders, vision panel frames, etc.)
   1. Primer finish – one (1) coat DuPont 67FD Alkyd Primer.
   2. Paint finish – two (2) coats DuPont Tufcote 72P Acrylic Enamel.

H. Pre-primed Epoxy Sheet Metal and Miscellaneous Exterior Metals (handrails, guardrails, fences and gates, HM door frames, HM doors, bollards, gutters, downspouts, steel column/beams/ornamentation, flashing, parapet caps, etc.)
   1. Primer finish – one (1) coat Galvite HS Primer B50 (not required at pre-primed epoxy sheet metal).
   2. Paint finish – two (2) coats DTM Acrylic Semi-Gloss Enamel B66 series.

I. Exterior Siding and Trim – Fiber Cement Board
   1. Finish – two (2) coats Mason's SelectWoodperfect Series coating, acrylic polymer, Project Coordinator approved custom mix as related to mockup review per Section 07460. Finish to provide natural cedar appearance.

K. Interior M.D.O. Plywood
   1. Primer finish – one (1) coat Sherwin Williams 200 Wallboard Primer, B28W200 series.
   2. Paint finish – two (2) coats Sherwin Williams Health Spec Low Odor Latex Egg-shell B9 series.

3.8 COLORS

A. Approximately ten (10) different colors will be utilized in the project.
B. Approximately twenty five (25) percent of the wall surfaces will be painted with moderately deep accent colors.

END OF SECTION 099100

SECTION 099600
COATINGS & PAINT

PART 1 GENERAL

This section covers surface preparation, furnishing, and application of paint and special protective coatings for buildings, Tanks, contents, and hardware complete.

Paint systems and colors for exterior surfaces of pumps, piping, and equipment shall be as specified in this section.

LOCATIONS WHERE COATINGS ARE PERFORMED: Surface preparation and coatings shall be done at the project site except the surface preparation and prime coats of the mechanical equipment shall be painted by their respective manufacturers per their standard unless noted otherwise hereinafter. The Contractor shall provide at his expense all shelter, heating, cooling, humidity control, and safety measures necessary to perform the work in accordance with these Specifications. The Contractor should consider prevailing weather conditions at the job site when scheduling painting.

The following areas or items are required to be COATED:

1. New welded steel water tank interior, exterior, joints, piping, bolts, and connections.

The following areas or items are required to be PAINTED:

1. Protection Bollards
2. Pipe Supports
3. Fire Hydrants
4. Isolation Valves

SURFACES NOT REQUIRING PAINTING: the following areas or items are not required to be painted unless otherwise specifically indicated in the Specifications or on the Plans:

1. Concrete surfaces.

2. Nonferrous and corrosion-resistant ferrous alloys such as copper, bronze, monel, aluminum, chromium plate, and stainless steel, except where:

    a. Required for electrical insulation between dissimilar metals
    b. Aluminum is in contact with damp concrete or masonry
    c. Color coding of equipment and piping is required
    d. Protection of metals is required in wet, humid, or chlorine environments.

3. Nonmetallic materials such as glass, polyvinyl chloride, concealed wood, porcelain, and plastics except as required for architectural painting or color coding.

4. Exposed electrical conduits, plumbing, and small piping need not be painted to match the color of the adjacent wall or equipment to which they are attached. Large diameter piping and appurtenances shall be painted as required for corrosion protection or color coding.

5. Electrical panels and equipment with finished enamel coatings applied by the manufacturer.

6. Roof gutters and downspouts with anodized or baked-on enamel finish.

7. Piping and conduit specifically shown on the Plans. Painting is required on fusion bonded epoxy coated steel pipe.

A. MATERIALS

GENERAL: Paint materials are identified by proprietary name to indicate the type and quality of material desired. Materials of other manufacturers may be substituted subject to the written approval of the Engineer. The paint manufacturer shall complete a CPAS form and provide a technical data sheet and MSDS for each paint product. The CPAS form is appended to this Specification.

DELIVERY AND STORAGE: All materials shall be delivered to the project site in unopened containers that plainly show at the time of use the designated name, color, date of manufacture, and name of manufacture. Paints shall be stored in a suitably protected area that is heated or cooled as required to maintained temperatures within the range recommended by the paint manufacturer in the CPAS.

COLORS: Colors not specified shall be selected by the Owner during the Shop Drawing submittal phase.

EQUIPMENT: For painting purposes, equipment shall be meant to include the machinery or vessel itself plus the structural supports.

PAINTING SYSTEMS: Surface preparation is defined in the WORKMANSHIP portion of this section.

Paint materials are listed in the following paint systems according to their generic type or specific use. At the end of the MATERIALS portion of this section, specific manufacturer's products are listed for each paint material. All paints within a system shall be produced by a single manufacturer.

Coverage is listed as either the total minimum dry film thickness in mils for the particular paint material, or the spreading rate in square feet per gallon (SFPG). The spreading rate for multiple coats is listed in square feet per gallon (SFPGPC). Spreading rates are based on 80 percent efficiency of application. Actual coverage may differ depending on the texture and 80 porosity of the surface. The number of coats is the minimum required irrespective of the applied coating thickness. Additional coats may be required to obtain the minimum required paint thickness,

depending on method of application, differences in manufacturer's products, and atmospheric conditions. Maximum film build per coat shall not exceed the coating manufacturer's recommendations.

WELDED STEEL TANK: The exposed surfaces of water tanks and piping, shall receive this system.

INTERIOR SYSTEM (AWWA D102, ICS-NO. 2)

1. Surface Preparation:	SSPC-SP 10 Near-White Metal Blast Cleaning 2.0-3.0 mil Profile
2. Prime Coat:	Sherwin-Williams Sherplate 600 @ 4.0-6.0 mils DFT
3. Intermediate Coat:	Sherwin-Williams Sherplate 600 @ 4.0-6.0 mils DFT
4. Finish Coat:	Sherwin-Williams Sherplate 600 @ 4.0-6.0 mils DFT
5. Total System:	12.0-18.0 mils DFT

EXTERIOR SYSTEM (AWWA D102, OCS-NO. 6)

1. Surface Preparation:	SSPC-SP 6 Commercial Blast Cleaning
2. Prime Coat:	Sherwin-Williams Macropoxy 646 @ 3.0-5.0 mils DFT
3. Intermediate Coat:	Sherwin-Williams Macropoxy 646 @ 3.0-5.0 mils DFT
4. Finish Coat:	Sherwin-Williams Hi-Solids Polyurethane 250@ 3.0-5.0 mils DFT
5. Total System:	9.0-15.0 mils DFT

OUTDOOR EXPOSED METAL: The exposed surfaces of discharge piping and valves, water tanks, and the WTP filters and piping, including the portion within the operations building and the contact faces of bolted connections shall receive this system.

Surface Prep	Paint Material	Min. Coats, Cover
SP10[(1) & (2)]	Zinc Primer	1 coat, 2.5 mils
	Hard Acrylic Satin	2 coats, 4 mils

[(1)]Anchor pattern of blast to be 2 mils.
[(2)]High pressure wash to remove all debris and loose paint on previously coated surfaces, including the existing pressure filters and piping, columns and hoist.

OUTDOOR IRON PIPE: Ductile iron or cast iron pipe that is not submerged or in a splash zone area but is exposed and is located outdoors and is required to be painted for purposes of aesthetics, piping color coding, etc., shall receive this system.

INDOOR IRON PIPE: Ductile iron or cast iron pipe that is not submerged or in a splash zone area but is exposed and is in a temperature conditioned environment that requires the pipe to be painted for aesthetics or piping color coding, etc., shall receive this system. If the pipe is indoors but is not in a temperature conditioned environment then it shall receive SYSTEM NO. 15

Surface Prep	Paint Material	Min. Coats, Cover
SP1[(1)]	Epoxy DTR	1 coat, 4 mils
	Hard Acrylic Satin	2 coats, 4 mils

[1]The surface of the manufacturer applied bituminous coating needs to be wire brushed and solvent wiped clean.

B. WORKMANSHIP

GENERAL: All painting work will be performed in strict accordance with the paint manufacturer's recommendations and these Specifications.

PROTECTION OF MATERIALS NOT TO BE PAINTED: Remove, mask, or otherwise protect hardware, lighting fixtures, switch plates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not intended to be painted. Provide drop cloths to prevent paint materials from falling on or marring any adjacent surfaces. Protect working parts of all mechanical and electrical equipment and from damage during surface preparation and painting process. All openings in motors shall be masked to prevent paint and all other materials from entering motors.

COMPLETENESS OF WORK: Painting of piping and equipment shall include all attached and related items, including valve handles, bolts, backs of grills, pipe supports, and similar miscellaneous items as required for satisfactory completeness of work.

METAL SURFACE PREPARATION:

General: All workmanship for metal surface preparation shall be in strict conformance with the applicable following Steel Structures Painting Council (SSPC) Specifications, AWWA D102-03, and additions.

Solvent Cleaning	SP 1
Hand Tool Cleaning	SP 2
Power Tool Cleaning	SP 3
White Metal Blast Cleaning	SP 5
Commercial Blast Cleaning	SP 6
Brush-Off Blast Cleaning	SP 7
Pickling	SP 8
Near-White Blast Cleaning	SP 10

Wherever the words "solvent cleaning," "hand tool cleaning," "wire-brushing," or "blast cleaning," or similar words of equal intent are used in these Specifications or in paint manufacturers' Specifications, they shall be understood to refer to the applicable SSPC Specifications listed above.

Hand tool clean areas that cannot be cleaned by power tool cleaning.

Preblast Cleaning Requirements: All oil, grease, welding fluxes, and other surface contaminants shall be removed prior to blast cleaning. Preblast cleaning methods shall use steam, hot water, or cold water with appropriate detergent additives followed with clean water rinsing.

Small, isolated areas shall be cleaned as above or solvent cleaned with suitable solvents and clean cloths.

All sharp edges shall be rounded or chamfered; and all burrs, jagged edges, and surface defects shall be ground smooth.

Welds and adjacent areas shall be prepared such that there is (1) no undercutting to reverse ridges on the weld bead; (2) no weld spatter on or adjacent to the weld or any other area to be painted; and (3) no sharp peaks or ridges along the weld bead. All embedded pieces of electrode or wire shall be ground flush with the adjacent surface of the weld bead.

Blast Cleaning Requirements: The type of equipment and speed of travel shall be such that the specified degree of cleanliness is obtained. The type and size of abrasive shall be selected to produce a surface profile that meets the coating manufacturer's recommendations for the particular primer to be used. Only dry blast cleaning methods will be permitted.

The abrasive shall not leave particles embedded in the blasted surface. All embedded particles shall be removed by reblasting with a different abrasive or another method of cleaning that can demonstrate its effectiveness to the satisfaction of the engineer.

Abrasive blast cleaning shall not be performed whenever the relative humidity exceeds 85 percent, nor whenever the surface temperature is within 5° F above the dew point of the ambient air and the temperature is falling. Dehumidifiers may be used to control the humidity.

The Contractor shall comply with applicable State and local air pollution control regulations for blast cleaning.

Post-blast Cleaning and Other Cleaning Requirements: All surfaces shall be cleaned of all dust and residual particles of the cleaning operations by brushing and air blast cleaning supplemented with vacuuming of the dust laden air prior to painting. Enclosed areas and other areas where dust settling is a problem shall be vacuum cleaned and wiped clean with a tack cloth.

Surfaces shall be painted within eight hours after the start of the cleaning operations or sooner, if required, to preclude surface rusting. Surfaces that have started to rust before they are painted shall be reblasted. A temporary holding primer or rust inhibitor compatible with the specified primer may be used by the Contractor provided written approval and instructions for its use are submitted by the paint manufacturer of the specified primer.

APPLICATION:

General: All paints and coatings shall be applied in strict accordance with the paint manufacturer's recommendations. The applied coatings shall contain no runs, bridges, shiners, laps, or other imperfections. It is intended that the coating system shall completely cover the area to be painted, be free of pinholes and holidays, and uniform in texture and color.

Controlled Environment: Whenever it is necessary to provide heating and/or dehumidifying in order to meet environmental requirements for applying or curing the coating, the Contractor shall

be certain that the appropriate safety measures are taken. No open flame heaters will be permitted during surface preparation or painting. Dehumidification shall be continued until the coating has cured sufficiently to recoat if the dehumidification is required to protect the substrate. Similarly, if heating is required in order to apply the coating it shall be continued until the coating has cured sufficiently for service.

Multiple Component Coatings: Multiple component coatings shall be prepared using all of the contents of the container for each component as packaged by the paint manufacturer. No partial batches will be permitted. Multiple component coatings that have been mixed shall not be used beyond their pot life. The paint applicator should purchase small quantity kits for touch-up painting and other small areas requiring painting. Only the components specified and furnished by the paint manufacturer shall be mixed. No intermixing of additional components for reasons of color or otherwise, even within the same generic type of coating, will be permitted unless written approval is obtained from the paint manufacturer.

Damaged Coatings: Damaged coatings, pinholes, and holidays shall have the edges feathered and repaired in accordance with the recommendations of the paint manufacturer.

All finish coats, including touch-up and damage repair coats shall be applied in a manner which will present a uniform texture and color-matched appearance.

SAFETY: Painting shall be performed in strict accordance with the safety recommendations of the paint manufacturer and with the safety recommendations of the National Association of Corrosion Engineers contained in the publication, “Manual for Painter Safety.” Unsafe conditions shall be cause of rejection of the work.

CLEANUP: All clothes and cotton waste that might constitute a fire hazard shall be placed in closed metal containers or destroyed at the end of each day. Upon completion of the work, all staging, scaffolding, and containers shall be removed from the site or destroyed in an approved manner. Paint spots, oil, or stains, upon adjacent surfaces and floors shall be completely removed, and the entire job shall be left clean and acceptable.

INSPECTION:

General: The preparation of surfaces and application of coatings and related materials as required to complete the work will be subject to inspection by the Engineer at all times during performance of the work.

The Contractor shall give the Engineer a minimum of three (3) days advance notice of the start of any surface preparation work or coating application work. All such work shall be performed only in the presence of the Engineer, unless the Engineer has granted prior approval to perform such work in his absence. Work which has been performed in the absence of the Engineer without his prior approval or work which is not performed in strict compliance with the procedures set forth in these Specification, will be subject to rejection.

Inspection by the Engineer, or the waiver of inspection of any particular portion of the work, shall not be construed to relieve the Contractor of his responsibility to perform the work in accordance with these Specifications.

Surface Preparation: The surface preparation will be inspected for compliance with these Specifications. All surfaces shall be subject to inspection prior to the start of the surface preparation.

Film Thickness and Integrity: The Contractor shall conduct film thickness measurements and electrical inspection of the coated surfaces and shall recoat and repair as necessary for compliance with the Specifications. Primer and intermediate coats will be subject to inspection by the Engineer.

After repair and recoat areas have dried sufficiently, final tests will be conducted by the Engineer. Coating thickness specified in mils will be measured with a magnetic type dry-film thickness gauge such as Mikrotest, supplied by Nordsen Pacific, Buena Park, CA or PosiTector 6000, manufactured by DeFelsko Corp., Ogdensburg, N.Y. Discontinued and voids in the coatings of surfaces in submerged or splash zone areas may be determined with an electrical holiday detector, low voltage we sponge type such as Model M-1, manufactured by Tinker and Rasor, San Gabriel, CA.

END OF SECTION 099600

DIVISIONS 10-21
-NOT USED-

DIVISIONS 10-30

-NOT USED-

DIVISION 22
-Plumbing-

SECTION 221200
WATER TANKS

PART 1 GENERAL

1.1 DESCRIPTION

A. This section includes all work for furnishing of all materials and equipment and erection of (1) 650,000-gallon welded steel water storage tank as shown on the drawings and specified herein. Includes design and shop drawings, fabrication, foundation design and installation, installation of tank structure, connections, and all appurtenances not otherwise specified in the bid schedule.

1.2 MEASUREMENT

A. Measurement and payment is per bid schedule Section 004100.

1.3 GENERAL DESIGN

A. The contractor shall be completely responsible for the design and construction, and for the integrity and satisfactory performance of the tanks during the guarantee period. The tanks shall conform to AWWA standard D103-97, to the latest edition Uniform Building Code, and to the requirements of the plans and these specifications. The supplier shall submit for approval complete and detailed plans for the tanks and appurtenances for approval by the Engineer.

PART 2 PRODUCTS

2.1 DESIGN DATA

A. The following data and information are supplied as a basis for design and erection of the tank and appurtenances:

1. Tanks shall be welded steel design in accordance with AWWA D100-Welded Carbon Steel Tanks for Water Storage.

2. Coatings shall adhere with AWWA D102- Coating Steel Water-Storage Tanks.

3. Allowable soil bearing: 2,000-psf

4. Lightning protection: ground tank.

5. Roof type: roof shall be of the column support type with a roof pitch not to exceed 2 inches per foot.

6. Wind load: base on 110 mph wind.

7. Snow Load: 40 lb/sf

8. Seismic design data shall be as follows:
   i. Site Class: D
   ii. Seismic Design Category: F
   iii. S_S=2.31
   iv. S_1=0.85
   v. S_{MS}=2.612
   vi. S_{M1}=1.82
   vii. S_{DS}=1.74
   viii. S_{D1}=1.21
   ix. Design basis: AWWA D100
   x. Importance Factor: I = 1.5

9. Tank steel floor system shall be (at a minimum) the same thickness as the thickest wall panel.

2.2 ACCESSORIES

A. Accessories such as ladders, fall prevention system (Saf-T-Climb, or equal), platforms, safety cages, access hatches and manways, vents, overflows, inlets, and outlets, and connections for level controls shall be furnished and installed as shown on the drawings, all in accordance with AWWA D103-97.

PART 3 EXECUTION

3.1 INSPECTION OF STEEL TANK

A. Mill or shop inspection is not required.

B. All materials shall be inspected in the field by the Engineer prior to erection.

C. A written report as set forth in Section 11.2.1 of AWWA D100-05 is required.

D. Special inspection of the welds is required by AWWA D100 and CBC Chapter 17.

3.2 PAINTING OF STEEL TANK

A. In accordance with Section 099600 plus requirements set forth herein. In the event of a conflict, the more stringent requirement shall govern.

B. Surface preparation for painting:

1. Interior of tank shall be SSPC-SP10 “Near White Blast Cleaning”.

2. Exterior of tank shall be SSPC-SP6 “Commercial Blast Cleaning”.

3. The tank is located in a residential area, and blasting procedures may have to be modified or delayed during windy periods if grit and dust adversely impact the surrounding area.

C. Inside paint system:

1. System shall conform to AWWA D102-06, inside paint system no. 1. Only paint systems approved by the NSF shall be used. Contractor shall submit the material Safety Data Sheet (MSDS) for the type of coating proposed.

2. A minimum of seven-day curing time shall be used with a continuous exhaust fan or blower of sufficient capacity to insure removal of solvent vapors during the curing process. Curing time shall be extended as necessary until coating is completely cured as determined by the coating manufacturer.

3. Following a five-day soaking period, the water in the tank, only, will be analyzed by the District using EPA Test method 502.2. If the concentration of any organic chemical contaminant exceeds State Standards as a result of the coating, the Contractor shall take corrective action at his sole expense, including replacing the coating if necessary. The cost of additional analytical tests shall also be paid for by the Contractor.

4. During soaking period, tanks shall be checked for leaks. Any that are found shall be repaired and the paint systems touched up and disinfected.

D. Outside paint system: system shall conform to AWWA D102-06, outside paint system no. 2. Paint color shall be a dark forest green as approved by the Owner.

E. Underside of bottom to be painted with a rubber coating.

F. All surfaces that are concealed after installation shall be coated prior to installation.

G. An 11-month inspection as specified in AWWA D102-06 shall be conducted and all necessary repairs made by the Contractor. An inspection report by an independent paint specialist selected by the Engineer shall also be provided and paid for by the Contractor.

3.3 DISINFECTION

A. Tanks shall be disinfected in accordance with AWWA Standard C652-02 after the final inside coat has cured. Disinfection solution shall be sprayed or brushed on the inside of the tank per Chlorination method 2.

END OF SECTION 221200

DIVISIONS 23-30
-NOT USED-

DIVISION 31
EARTHWORK

SECTION 311100
CLEARING & GRUBBING

PART 1 GENERAL

1.1 DESCRIPTION

A. This section includes protection of facilities, clearing site of incidental paving, surface debris, grasses, trees, and other plant life in preparation for site excavation work and general development.

PART 2 PRODUCTS (not used)

PART 3 EXECUTION

3.1 PROTECTION

A. Locate, identify, and protect existing facilities scheduled to remain in place from damage during clearing and grubbing practices.

B. Identify and protect trees, plant growth, and features designated to remain as final landscaping.

C. Protect benchmarks from damage and displacement.

3.2 CLEARING

A. Clear only those areas required in order to accommodate proposed developments. Do not adversely impact adjacent property, frontage improvements, or other property features or improvements.
B. See scope of work section for additional coordination and administrative requirements.

3.3 REMOVAL

A. Remove paving, brush, trees, and other debris as required and dispose of off-site in strict accordance with applicable laws and regulations.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A Measurement and payment for all work shall be in accordance with the contract BID SCHEDULE, refer to Section 004100 and actual work as field measured and verified. No payments will be made for materials on hand. All payments to be made following field verification of work.

END OF SECTION 311100

SECTION 312200
GRADING

PART 1 GENERAL

1.1 DESCRIPTION

A. This Section includes regulatory requirements, protection, site grading, excavation, backfilling, compaction, quality control, and restoration.

1.2 MEASUREMENT

A. Site Grading: Paid as a Lump Sum as included in the Bid Schedule Section 004100 including all work as described in Section 011000.

1.3 REFERENCES

A. ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.5 Kg) Rammer and 12 inch (300 mm) Drop.

B. ASTM D1556 - Test Method for Density of Soil in Place by the Sand-Cone Method.

C. ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb (4.5 Kg) Rammer and 18 inch (450 mm) Drop.

D. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

E. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

F. ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

1.4 SUBMITTAL REQUIREMENTS

A. In accordance with the requirements of Section 6705 of the Labor Code of the State of California, submit a detailed plan to the Engineer before excavation, showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of any trench or trenches 5 feet or more in depth.

B. Plan must be submitted and approved by the Engineer prior to start of work.

1.5 DEFINITIONS

A. Utility: Any buried pipe, duct, conduit, or cable.

B. Structure: Foundation, manhole, septic tank, cleanout, catch basin, vault, or culvert.

C. Solid Rock: Large continuous masses of igneous, metamorphic, or sedimentary rock, which in the opinion of the Engineer cannot be excavated without drilling and blasting. Soil that is capable of being excavated with rippers is not considered solid rock.

D. Loose Rock: Boulders and other detached stones, with a minimum volume of 1 cubic yard.

1.6 FIELD MEASUREMENTS

A. Verify that survey benchmarks, control points, and intended elevations are as shown on drawings.

1.7 PROTECTION

A. Barricade open excavations.

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

C. Provide safe conditions for workers and passers-by.

PART 2 PRODUCTS (not used)

PART 3 EXECUTION

3.1 PREPARATION

A. Notify Underground Service Alert (800) 227-2600 in Northern California prior to excavation. Comply with their notice requirements.

B. Coordinate with Owner for necessary permitting.

C. Identify required lines, levels, contours, and datum locations.

D. Protect plant life, lawns, rock outcropping, and other features remaining as final landscaping.

E. Protect benchmarks, existing structures, fences, and paving from excavating equipment and vehicular traffic.

F. Maintain and protect utilities and structures to remain.

3.2 EXCAVATION

A. Use open cut method on all excavation unless otherwise shown on the drawings, required by permit, or approved in writing by the Engineer.

B. Stockpile excavated material on site. Any material not utilized for construction purposes

may be spread onsite or removed from the site as designated by the Engineer.

3.3 CLASSIFICATION OF EXCAVATION

A. All excavation with equipment commonly used in the industry is classified as common excavation (except for drilling and blasting).

3.4 FIELD QUALITY CONTROL

A. The Owner, at its discretion, may acquire the services of a certified soils testing laboratory to perform baseline Modified Proctor density tests in accordance with Cal 216 or latest revision:

1. Tests may be performed at locations approved by the Engineer.
2. Test results from tests prior to construction will be made available to the contractor.
3. Testing is at the Owner’s expense.

B. Compaction testing will be determined at the Engineer's discretion.

C. If work does not meet specified requirements, remove, replace, and retest. All re-testing is at the contractor’s expense. Compaction tests shall be used as the basis for determination of acceptability of work performed under this contract.

3.5 PROTECTION OF FINISHED WORK

A. If vehicular traffic has altered finished work, reshape and re-compact.

END OF SECTION 312200

SECTION 312300
EXCAVATION AND FILL

PART 1 GENERAL

1.1 DESCRIPTION

A. This Section includes requirements for excavation, backfilling, compaction, quality control, and restoration.

1.2 MEASUREMENT

A. Excavation and Fill: Cost to be per Cubic Yard per Bid Schedule Section 004100. Includes all labor material and equipment necessary for the excavation and fill to the lines and grades shown on the project plans for construction. Fill shall be compacted per this section. Measurement shall be made by weight tickets or performing field surveys after initial site grading and after fill is complete, and shall be measured by the in-place volume or by other methods agreed upon between the Contractor and the Engineer. No allowance will be made for shrink/swell of fill material during excavation or transport. No separate payment will be made for fill materials utilizing onsite soils.

B. Trenching & Backfilling: Cost to be included in other items. Includes excavating trenches and backfilling for all pipe and utilities in the project area.

1.3 REFERENCES

A. ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.5 Kg) Rammer and 12 inch (300 mm) Drop.

B. ASTM D1556 - Test Method for Density of Soil in Place by the Sand-Cone Method.

C. ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb (4.5 Kg) Rammer and 18 inch (450 mm) Drop.

D. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

E. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

F. ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

1.4 SUBMITTAL REQUIREMENTS

A. In accordance with the requirements of Section 6705 of the Labor Code of the State of California, submit a detailed plan to the Engineer before excavation, showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from

the hazard of caving ground during the excavation of any trench or trenches 5 feet or more in depth.

B. Submit the plan to the Engineer prior to start of excavation.

1.5 DEFINITIONS

A. Utility: Any buried pipe, duct, conduit, or cable.

B. Structure: Foundation, manhole, septic tank, cleanout, catch basin, vault, or culvert.

C. Solid Rock: Large continuous masses of igneous, metamorphic, or sedimentary rock, which in the opinion of the Engineer cannot be excavated without drilling and blasting. Soil that is capable of being excavated with rippers is not considered solid rock.

D. Loose Rock: Boulders and other detached stones, with a minimum volume of 1 cubic yard.

1.6 FIELD MEASUREMENTS

A. Verify that survey benchmarks, control points, and intended elevations are as shown on drawings.

1.7 PROTECTION

A. Barricade open excavations.

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

C. Provide safe conditions for workers and passers-by.

PART 2 PRODUCTS

2.1 IMPORTED PIPE EMBEDMENT

A. Use crushed stone or gravel that is free of shale, clay, friable material, and debris. Grade in accordance with ASTM C136, within the following limits:

Sieve Size	Percent Passing
1 in	100
3/4 in	90 to 100
3/8 in	20 to 55
No. 4	0 to 10
No. 8	0 to 5

2.2 IMPORTED STRUCTURAL FILL

A. Use imported soil (if required) that has angular fragments and a low expansion index (less than 30 per ASTM D 4829). Use imported fill that complies with the requirements of Caltrans Class 2 Aggregate Sub-base:

Sieve Size	Percent Passing (Contract Compliance)
3 in (75mm)	100
1½ in (63mm)	87 to 100
No. 4 (4.75mm)	45 to 100
No. 200 (.075mm)	0 to 34

PART 3 EXECUTION

3.1 PREPARATION

A. Notify Underground Service Alert (800) 227-2600 in Northern California prior to excavation. Comply with their notice requirements.

B. Identify required lines, levels, contours, and datum locations.

C. Protect plant life, lawns, rock outcropping, and other features remaining as final landscaping.

D. Protect benchmarks, existing structures, fences, and paving from excavating equipment and vehicular traffic.

E. Maintain and protect utilities and structures to remain.

3.2 EXCAVATION

A. Use open cut method on all excavation unless otherwise shown on the drawings, required by permit, or approved in writing by the Engineer.

B. Stockpile excavated material on site. Any material not utilized for construction purposes may be spread onsite or removed from the site as designated by the Engineer.

3.3 CLASSIFICATION OF EXCAVATION

A. All excavation with equipment commonly used in the industry is classified as common excavation (except for drilling and blasting).

3.4 TRENCH EXCAVATION

A. Cut trenches sufficiently wide to enable installation and inspection. Remove water or materials that interfere with work. When groundwater is encountered the Contractor must

submit a dewatering plan to the Engineer for approval.

B. Maintain trench sides as vertical as possible--between 12 inches and 24 inches wider than the outside diameter of the pipe barrel--below pipe level.

C. Excavate trench width above the pipe as wide as necessary for shoring, sheeting, and installation.

D. Center trench excavation on pipe alignment for a minimum clearance of 6 inches on each side of the pipe.

E. Hand trim for bell and spigot pipe joints. Remove loose matter.

F. Restore over-excavated areas. If the trench bottom is over-excavated below the intended grade, fill over-excavation with imported pipe embedment and compact to density equivalent to the in situ material.

G. Remove lumped subsoil, boulders, and rock up to ½ yd3 (measured by volume).

H. Excavate for additional trench depth when soil prevents adequate pipe support. Refill addition with imported pipe embedment. Remove large rock, boulders, and large stones to provide 3 inches of soil cushion on all sides of the pipe and pipe accessories.

I. Length of trench that may be left open at any one time is 100 yards. Do not leave trench open over night.

J. Stockpile excavated material in designated area on site, and remove excess material from site.

3.5 STRUCTURE EXCAVATION

A. Excavate for structures down to the levels indicated on the drawings or as directed by the Engineer. Excavate as large as necessary to accommodate the work forms. When necessary, over-excavate to remove unsuitable soil and replace with engineered fill. Comply with all safety regulations.

B. Excavate a sufficient distance from walls and footings to provide forming except where concrete for walls or footings is directly against excavated surfaces.

C. Do not excavate below depths indicated in the drawings. Restore over-excavated areas to proper elevation by filling with imported structural fill. Do not interfere with 45 degree bearing splay of foundations.

D. Hand-trim the bottom of the excavation to prevent disturbing the soil below the required depth.

3.6 BACKFILLING

A. Use care to prevent disturbance or damage to utilities or structures in trench.

B. Maintain optimum moisture content to attain required compaction density.

C. Remove surplus fill materials from site.

D. Leave fill material stockpile areas free of excess fill materials.

3.7 TRENCH BACKFILLING

A. Use excavated soil as embedment unless Engineer determines it unsuitable. Unsuitable material is defined as incapable of being compacted to specified density with optimum moisture content, solid or loose rock, lump material larger than 1 inch, organic matter, or debris.

B. Use excavated soil as final backfill unless the Engineer determines it unsuitable. Unsuitable final backfill material is solid or loose rock larger than 6 inches or lumps larger than 3 inches. Do not use organic matter or debris.

C. Backfill pipe embedment material in uniform layers on all sides of the pipe in lifts not to exceed 6 inches.

D. Backfill trenches with one sack flowable fill in roadways per Trinity County Department of Transportation Standards.

E. Use the following methods when placing final backfill material unless otherwise required by permits or authority.

Compact	Not to Exceed (In loose measure)
Roadways	6 inches thick
Rights-of-way and outside roadway	12 inches thick
Unimproved surfaces	24 inches thick

3.8 STRUCTURE BACKFILLING

A. Place structure fill material in uniform layers on all sides of the structure 6 inches thick.

B. Do not fill structure material until the structure footing or other portions of the structure have been inspected.

C. Use excavated soil as final backfill material unless Engineer determines it unsuitable. Unsuitable final backfill material is solid or loose rock larger than 6 inches or lumps larger than 3 inches. Do not use organic matter or debris.

3.9 COMPACTION

A. Compact final backfill to the percentage of maximum density determined by Cal 216 and as provided in “Percent of Maximum Density” table below, unless otherwise specified by

the Owner.

Percent of Maximum Density				
Location	**Bedding**	**Haunching**	**Initial Backfill**	**Final Backfill**
Roadways, Improved Surfaces	95	95	95	95
Roadway Rights-of-Way Outside of Roadway Prism	90	90	90	90
Unimproved Surfaces, Fields, Etc.	90	90	80	80
Backfill Around Structures	95	95	95	95

3.10 FIELD QUALITY CONTROL

A. The Owner, at its discretion, may acquire the services of a certified soils testing laboratory to perform baseline Modified Proctor density tests in accordance with Cal 216 or latest revision:

1. Tests may be performed at locations approved by the Engineer.
2. Test results from tests prior to construction will be made available to the contractor.
3. Testing is at the Owner’s expense.

B. Compaction testing will be determined at the Engineer's discretion.

C. If work does not meet specified requirements, remove, replace, and retest. All re-testing is at the contractor’s expense. Compaction tests shall be used as the basis for determination of acceptability of work performed under this contract.

3.11 PROTECTION OF FINISHED WORK

A. If vehicular traffic has altered finished work, reshape and re-compact.

END OF SECTION 312300

SECTION 312500
EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Clearing and Grubbing: Section 311100

B. Grading: Section 312200.

C. Excavation and Fill: Section 312300.

D. Division 32.

E. Division 33.

1.2 REFERENCES

A. Erosion and Sediment Control Guidelines: Conform to the latest edition of EPA Standards and Specifications for Erosion and Sediment Control". Refer to these guidelines for construction and maintenance of all items (Temporary and Permanent Structural, Vegetative and Biotechnical) included in the Storm Water Pollution and Prevention Plan (SWPPP).

B. Storm Water Management: Conform to the latest edition of EPA Stormwater Management Design Manual.

1.3 RESPONSIBILITY

A. A Storm Water Pollution and Prevention Plan (SWPPP) has been prepared for this project. Install and maintain the temporary storm water and diversion control items as shown on the drawings before starting any grading or excavation and maintain compliance of all Storm Water Pollution Plan/NPDES regulations. Provide any temporary sediment and erosion control measures that may be required within limits of the work, including any staging areas, throughout construction in conformance with the plan, and as directed by the Owner's Representative. Place the permanent control practices required before the removal of the temporary storm water diversion and control items.

B. During construction conduct operations in such a manner as to prevent or reduce to a minimum any damage to any water body from pollution by debris, sediment, chemical or other foreign material, or from the manipulation of equipment and/or materials in or near a stream or ditch flowing directly to a stream. Any water which has been used for wash purposes or other similar operations which become polluted with sewage, silt, cement, concentrated chlorine, oil, fuels, lubricants, bitumens, or other impurities shall not be discharged into any water body.

C. In the event of conflict between these specifications and the regulation of other Federal, State, or local jurisdictions, the more restrictive regulations shall apply.

D. The Contractor shall adhere to all requirements of the Storm Water Pollution Prevention Plan. Comply with all applicable regulatory requirements.

E. The Contractor will submit copies of certificates documenting that on-site workers have completed an Erosion & Sediment Control training as required.

1.4 DESCRIPTION

A. The Work shall consist of furnishing, installing, inspecting, maintaining, and removing soil and erosion control measures as shown on the contract documents or as ordered by the Director's Representative during the life of the contract to provide erosion and sediment control.

B. Temporary structural measures provide erosion control protection to a critical area for an interim period. A critical area is any disturbed, denuded slope subject to erosion. These are used during construction to prevent offsite sedimentation. Temporary structural measures shall include check dams, construction road stabilization, stabilized construction entrance, dust control, earth dike, level spreader, perimeter dike/swale, pipe slope drain, portable sediment tank, rock dam, sediment basin, sediment traps, silt fence, storm drain inlet protection, straw/hay bale dike, access waterway crossing, storm drain diversion, temporary swale, turbidity curtain, water bars or other erosion control devices or methods as required.

C. Permanent structural measures also control protection to a critical area. They are used to convey runoff to a safe outlet. They remain in place and continue to function after completion of construction. Permanent structural measures shall include debris basins, diversion, grade stabilization structure, land grading, lined waterway (rock), paved channel, paved flume, retaining wall, riprap, rock outlets, and stream bank protection or other erosion control devices or methods as required.

D. Vegetative measures shall include brush matting, dune stabilization, grassed waterway, vegetating waterway, mulching, protecting vegetation, seeding, sod, straw/hay bale dike, stream bank protection, temporary swale, topsoil, and vegetating waterways.

E. Biotechnical measures shall include wattling (live fascines, brush matting, brush layering, live cribwall, and branchpacking) vegetated rock gabions, live staking, tree revetment, and fiber rolls.

F. Weekly inspections will be completed by the Director's Representative. Comply with and correct all deficiencies found as a result of these inspections. At the end of the construction season when soil disturbance activities will be finalized or suspended until the following spring, the frequency of the inspections may be reduced. If soil disturbance is completely suspended and the site is properly stabilized, a minimum of monthly inspections must be maintained. The stabilization activities must be completed before

snow cover or frozen ground. If vegetation is required, seeding, planting and/or sodding must be scheduled to avoid die-off from fall frosts and allow for proper germination/establishment. Weekly inspections must resume no later than March 15.

1.5 DEFINITIONS – TEMPORARY STRUCTURAL MEASURES

A. Check Dam: Small barrier or dam constructed of stone, bagged sand or gravel to reduce velocity of flow.

B. Construction Road Stabilization: Stabilization of construction roads to control erosion.

C. Stabilized Construction Entrance: A stabilized pad of aggregate underlain with geo-textile where traffic enters a construction site to reduce or eliminate tracking of sediment to public roads.

D. Dust Control: Prevent surface and air movement of dust from disturbed soil surfaces.

E. Earth Dike: A temporary berm or ridge of compacted soil, located to channel water to a sediment trapping device.

F. Level Spreader: A non-erosive outlet for concentrated runoff to disperse flow uniformly across a slope.

G. Perimeter Dike/Swale: A temporary ridge of soil excavated from an adjoining swale located along the perimeter of the site or disturbed area to prevent runoff from entering a disturbed area and preventing sediment laden runoff from leaving a construction site.

H. Pipe Slope Drain: A structure placed from the top of a slope to the bottom of a slope to convey runoff without causing erosion.

I. Portable Sediment Tank: A compartmented tank to which sediment laden water is pumped to retain sediment before pumping the water to adjoining drainage ways.

J. Rock Dam: A rock embankment located to capture sediment.

K. Sediment Basin: A barrier constructed across a drainage way to intercept and trap sediment.

L. Sediment Traps: A control device formed by excavation to retain sediment at a storm inlet or other points of collection.

M. Silt Fence: A barrier of geo-textile fabric installed on contours across the slope to intercept runoff by reducing velocity. Replace after 1 year.

N. Storm Drain Inlet Protection: A semi-permeable barrier installed around storm inlets to prevent sediment from entering a storm drainage system.

O. Straw/Hay Bale Dike: Intercept sediment laden runoff by reducing velocity. Replace after 3 months.

P. Access Waterway Crossing: A structure placed across a waterway to provide circulation for construction purposes.

Q. Storm drain Diversion: The redirection of a storm drain line or outfall channel for discharge into a sediment trapping device.

R. Temporary Swale: A temporary excavated drainage swale.

S. Turbidity Curtain: A flexible, impenetrable barrier used to trap sediment when construction occurs within water bodies or along a shoreline.

T. Water Bars: A ridge or channel constructed diagonally across a sloping road or right-of-way.

1.6 DEFINITIONS – PERMANENT STRUCTURAL MEASURES

A. Diversion: A parabolic or trapezoidal swale with a supporting ridge on the lower side constructed across a slope to intercept and convey runoff to stable outlets at non-erosive velocities.

B. Debris Basin: A barrier or dam constructed across a waterway to form a basin for catching and storing sediment or debris that gives protection downstream.

C. Grade Stabilization Structure: A structure to stabilize the grade by providing channel linings that can withstand high velocities.

D. Lined Waterway (rock): A waterway lined with stone to dispose of high velocity runoff.

E. Paved Channel (concrete): A waterway lined with concrete to dispose of high velocity runoff.

F. Paved Flume: A concrete lined channel to convey water down a steep slope.

G. Retaining Wall: A structural wall constructed to prevent soil movement down steep slopes.

H. Riprap: A layer of stone designed to protect slopes that are subject to erosion.

I. Rock Outlets: Rock placed at the outlet end of culverts, conduits or channels.

J. Stream Bank Protection: Stabilization of eroding stream banks through use of riprap, gabions or pre-cast concrete units.

1.7 DEFINITIONS – VEGETATIVE MATERIALS MEASURES

A. Brush Matting: Hardwood brush layered along a stream bank with a grid of stakes and wire. This acts as a mulch for seedlings established in the bank.

B. Dune Stabilization:

C. Grassed or Vegetating Waterway: A parabolic or trapezoidal channel below adjacent ground level stabilized by vegetation to convey water without causing erosion.

D. Mulches: Hay, straw, wood cellulose, fiber mats, flexible growth medium and other materials approved by the Director's Representative.

E. Protecting Vegetation: Protecting trees, shrubs, ground cover and other vegetation from damage.

F. Temporary Seeding: Erosion control protection to a critical area for an interim period. A critical area is any disturbed, denuded slope subject to erosion.

G. Permanent Seeding: Grasses established and combined with shrubs to provide perennial vegetative cover on disturbed, denuded, slopes subject to erosion.

H. Sod: Used where a quick vegetative cover is required.

I. Straw/Hay Bale Dike: Intercept sediment laden runoff by reducing velocity. Replace after 3 months.

J. Stream Bank Protection: Stabilization of eroding stream banks through use of vegetation.

K. Temporary Swale: A temporary excavated drainage swale.

L. Topsoil: Placed before permanent seeding or sod is installed.

1.8 DEFINITIONS – BIOTECHNICAL MATERIALS MEASURES

A. Vegetative Rock Gabions: A combination of vegetation and rock gabions for slope stabilization. Live branch cuttings are layered through the gabion protruding beyond the face of the gabion.

B. Live Fascines: Bundles of branches staked into shallow trenches which are then filled with soil. They are oriented along a contour and placed in multiple rows.

C. Brush Matting: Hardwood brush layered along a stream bank with a grid of stakes and wire. This acts as a mulch for seedlings established in the bank.

D. Live Staking: Large stakes sharpened at the bottom end and forced vertically into the ground.

E. Brush Layering: Stabilize slope areas above the flow line of stream banks. Long branches are placed with cut ends into a terraced slope.

F. Live Crib Wall: A combination of vegetation and structural elements used along streams where flowing water is a hazard. Layers of logs are alternated with long branches protruding out between them.

G. Tree Revetment: Used for bank stabilization by placing tree trunks and branches overlapped and anchored to absorb energy, reduce velocity and capture sediment.

H. Branch Packing: Alternates live branch cuttings and tamped backfill to repair small localized holes in slopes. Used for areas less than 4' deep and 6' wide.

I. Fiber Roll: A coconut fiber, straw, or excelsior woven roll encased in a netting of jute, nylon, or burlap to dissipate water energy and provide a medium for introduction of herbaceous vegetation. Anchor into a bank and provide suitable backfill behind the roll where vegetation can be planted.

PART 2 PRODUCTS

2.1 MATERIALS

A. Plant Materials for biotechnical slope protection: Locate stands of specified species and obtain approval to harvest material from these stands or obtain from managed production beds that are maintained for commercial distribution. Install all plant materials within 8 hours of cutting or provide proper storage.

1. Shrub willows: "Streamco" purpleosier willow, and "Bankers" dwarf willow, Redosier Dogwood.

B. Seeding: Permanent see Section 329219.

2.2 COMPANIES-TEMPORARY STRUCTURAL

A. The following companies are manufacturers of temporary structural products. See highlighted notes to determine the specific products manufactured by each company.

1. Mirafi, 365 South Holland Drive, Pendergrass, Ga, 30567, (888) 795-0808, www.mirafi.com.
2. North American Green, 14649 Highway 41 North, Evansville, IN 47725, (800) 772-2040, www.nagreen.com.
3. Siltdam Inc., P.O. Box 960, Brockton MA, 02303, (800) 699-2374, www.spilldam.com.
4. Nedia Enterprises, Inc., 22187 Vantage Pointe Place, Ashburn, VA 20148, (888) 725-6999, www.nedia.com.
5. Belton Industries, 5600 Oakbrook Parkway, Norcross GA., 30093, (800) 225-4099, www.beltonindustries.com.
6. KriStar, 1219 Briggs Ave., Santa Rosa, CA 95401, (800) 579-8819, www.kristar.com.

7. Rolanka International Inc., 155 Andrew Drive, Stockbridge GA 30281, (800) 760-3215, www.rolanka.com.
8. Apex Resources Inc., 12910 Shelbyville Road, Louisville, KY 40243 (888) 677-2739, www.apexr.com.
9. MonoSol, LLC, 707 E. 80th PL., Merrillville, IN 46410 (800) 237-9552, www.terraloc.com.
10. Brockton Equipment Inc., P.O. Box 960, Brockton, MA 02303 (800) 699-2374, www.spilldam.com.
11. Aer-Flo Inc., 4455 18th St. East, Bradenton, FL 34203 (800) 823-7356, www.aerflo.com.
12. Contech Construction Products Inc., 9025 Centre Point Drive, Suite 400, West Chester, Ohio 45069, (800) 338-1122, www.contech-cpi.com.

2.3 COMPANIES-PERMANENT STRUCTURAL

A. Gabions, retaining walls, stone mattresses:
   1. Contech Construction Products Inc., 9025 Centre Point Drive, Suite 400, West Chester, Ohio 45069, (800) 338-1122, www.contech-cpi.com.

2.4 COMPANIES-VEGETATIVE

A. Nedia Enterprises, Inc., 22187 Vantage Pointe Place, Ashburn, VA 20148, (888) 725-6999, www.nedia.com.

B. Agrecol Corporation, 2918 Agriculture Drive, Madison, Wi, 53718, (608) 226-2544, www.agrecol.com.

2.5 COMPANIES-BIOTECHNICAL

A. Biodegradable blankets
   1. Rolanka International Inc., 155 Andrew Drive, Stockbridge GA 30281, (800) 760-3215, www.rolanka.com.
   2. Nedia Enterprises, Inc., www.nedia.com.
   3. Kristar (800) 579-8819.

PART 3 EXECUTION

3.1 WORK AREAS

A. The Director's Representative has the authority to limit the surface area of erodible earth exposed by earthwork operations and to direct the Contractor to provide immediate temporary or permanent erosion measures to minimize damage to property and contamination of watercourses and water impoundments. Under no circumstances will the area of erodible earth material exposed at one time exceed 50,000 sq. ft. The Director's Representative may increase or decrease this area of erodible earth material exposed at one time as determined by his analysis of project, weather and other conditions. The Director's Representative may limit the area of clearing and grubbing

and earthwork operations in progress commensurate with the Contractor's demonstrated capability in protecting erodible earth surfaces with temporary, permanent, vegetative or biotechnical erosion control measures.

B. Schedule the work so as to minimize the time that earth areas will be exposed to erosive conditions. Provide temporary structural measures immediately to prevent any soil erosion.

C. Provide temporary seeding on disturbed earth or soil stockpiles exposed for more than 7 days or for any temporary shutdown of construction. In spring, summer or early fall apply rye grass at a rate of 1 lb/ 1000 sq.ft. In late fall or early spring, apply certified Aroostook Rye at a rate of 2.5 lbs./ 1000 sq. ft. Apply hay or straw at a rate of 2 bales/ 1000 sq. ft. or wood fiber hydromulch at the manufacturer's recommended rate. Hay or straw shall be anchored.

D. Coordinate the use of permanent controls or finish materials shown with the temporary erosion measures.

E. All erosion and sediment control devices must be maintained in working order until the site is stabilized. All preventative and remedial maintenance work, including clean out, repair, replacement, re-grading, re-seeding, or re-mulching, must be performed immediately.

F. After final stabilization has been achieved temporary sediment and erosion controls must be removed. Areas disturbed during removal must be stabilized immediately.

END OF SECTION 312500

DIVISION 32
EXTERIOR IMPROVEMENTS

SECTION 321123
AGGREGATE BASE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Aggregate base course

1.2 MEASUREMENT

A. Aggregate Base: Paid by the Ton. Includes subgrade preparation, supply of aggregate base, preparation and compaction of aggregate base, and testing.

1.3 REFERENCES

A. State of California, Department of Transportation, Standard Specifications http://www.dot.ca.gov/hq/esc/oe/construction_standards.html, latest edition.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with State of California, Department of Transportation, Standard Specifications, current addition.
B. Obtain materials from same source throughout the life of the project.

1.5 SUBMITTALS

A. Contractor must submit mix design to the Engineer for approval prior to placement of material in the field.

PART 2 PRODUCTS

2.1 MATERIALS

A. Aggregate for Base: Course: 1-1/2”- crushed rock or 3/4”- washed
In accordance with State of California, Department of Transportation, Standard Specifications 2022, Section 26.

PART 3 EXECUTION

3.1 PLACING AGGREGATE BASE

A. Install Work in accordance with State of California, Department of Transportation, Standard Specifications current edition.

3.7 PROTECTION

A. Immediately after placement, protect aggregate base from mechanical injury.

END OF SECTION 321123

SECTION 323113
CHAIN LINK FENCE AND GATES

PART 1 GENERAL

1.1 DOCUMENTS

A. The General Conditions and all other Contract Documents for this project are complementary and applicable to this section of the Specifications.

1.2 SCOPE OF WORK

A. Furnish all labor, materials, equipment, facilities, transportation and services to complete all structural and miscellaneous steel work and related work as shown on the drawings and/or specified herein.

B. Work included: the general extent of the chain link fence work is shown on the drawings and includes, but is not necessarily limited to, the following:

i. 6’ high chain link fence at perimeter as shown on Drawings
ii. Gates as shown on Drawings

C. Related Work: Concrete paving and concrete for footings are covered under Section 32 1313 of these specifications.

1.3 REFERENCES

A. Chain Link Fence Manufacturer’s Institute (CLFMI) – voluntary Standard for Chain Link Fence Installation

B. ASTM A120 – Black and Hot Dip Zinc Coated (Galvanized) Welded and Seamless Steel Pipe

C. ASTM A120 – Zinc (Hot-Galvanized Coatings on Products Fabricated from Rolled, Pressed and Forged Steel Shapes, Bars, and Strip)

D. ASTM F934 Specification for Standard Colors for Polymer-Coated Chain Link

1.4 SUBMITTALS

A. Shop Drawings: Submit shop drawings for approval prior to construction showing complete details of fences and gates, including sizes and shapes of members, dimensions, spacing of components, connections, accessories, fittings, hardware including anchorages and footings.

1.5 QUALITY ASSURANCE

A. Contractor shall be responsible for locating all fence post footings to avoid any conflicts with

underground utilities.

B. Coordination: Coordinate with other trades to ensure proper sequencing and fitting of construction for fences and gates.

1.6 PRODUCT STORAGE

A. Store steel materials, either plain or fabricated, above ground on platforms, pallets, skids, or other supports. Keep materials free from dirt, grease, and other foreign matter and keep dry to protect from corrosion.

PART 2 MATERIALS

2.1 GENERAL

A. All piping for fence and gates shall be Schedule 40 hot-dipped galvanized steel or approved equal for size, finish, material composition, strength, appearance, performance and ease of maintainability.

B. Galvanizing shall be in accordance with ASTM F 668-88. All fence fittings shall comply with ASTM F626-89a.

2.2 FABRIC

A. Chain link fence fabrics to be “Galvanized-after” as manufactured by Anchor Fence Co. or approved equal and to be No. 9 gauge with uniform square mesh measuring approximately 2 inches between its parallel sides. It is to be woven of the best quality open hearth steel, heavily zinc coated, after weaving, by the hot dip spelter process.

B. Lower edge of fabric shall be no greater than one and one-half (1-1/2) inches above concrete or finished grade as specified on plans and details.

C. Fabric shall have a knuckled top and bottom selvage.

D. Height of fabric measured from the ends of the knuckled selvage shall be as specified on plans and details, plus or minus 1 inch per 8 lineal feet.

E. The fabric shall be fastened to the line posts and rails by means of ties spaced approximately 14” apart. Fabric shall be attached to the terminal post by means of a tension strip held by specially designed clips.

2.3 LINE POSTS

A. Line posts shall be hot dipped galvanized round column as specified in the Drawings. Line posts shall be spaced not further than 10’ on center. Caps of line posts shall be flat and without decorative finial.

2.4 TERMINAL POSTS

A. End, corner and pull posts shall be hot dipped galvanized pipe (round), as specified in the Drawings. Caps of terminal posts shall be flat and without decorative finial.

2.5 HORIZONTAL RAIL

A. Rail to be hot dipped galvanized Schedule 40 pipe and to be furnished in random lengths of approximately 20 feet. Top rail to be joined using a press steel or malleable sleeve, not only allowing for expansion and contraction, but also providing a continuous brace from end to end of each stretch of fence. Fence shall have continuous top and bottom rails. Fence shall have continuous mid-rail were indicated on plan.

2.6 BRACES

A. All terminal posts on fence 6 ft. and higher shall be braced with 1 5/8" O.D. horizontal pipe bracing of the same material as the top rail, securely attached to the terminal and first line post with malleable iron fittings. They shall be truss braced from the first line post to the bottom of the terminal post, with a 3/8" galvanized truss rod assembly to provide the proper tension. Corner posts shall be braced in both directions.

2.7 FITTINGS

A. Hot dip galvanized. All fittings shall be malleable cast iron or pressed steel.

2.8 FABRIC TIES

A. 11-gauge galvanized wire ties shall be used to fie the fabric to the line posts and top rail.

2.9 FRAME WORK MATERIAL

A. All posts, rails and braces to be heavy galvanized 1.8 oz. coating.

2.10 SHAPE OF POSTS

A. Alternate shapes, such as square pipe, to be acceptable only upon written approval.

2.11 GATES

A. Gates shall be of the widths designated in the drawings.

B. Gate frame panels shall be cross trussed with 3/8-inch adjustable truss rods. The corners of the gate frames shall be fastened together by welding.

C. Gate posts, frames, and hardware shall be hot-dipped galvanized. Gate frames shall be

galvanized. Gate fabric shall match fencing fabric. Gates shall maintain no gaps greater than two (2) inches between gateposts and frames or one and one-half (1-1/2) inches above the ground.

2.12 MISCELLANEOUS

A. Tie wires and hog rings shall be at least 9-gauge (0.148" dia.) steel and post clips shall be at least 6-gauge (0.192" dia.) steel; all these shall be galvanized in accordance with the provisions of ASTM Designation: A1 116, Coating Class.

B. Turnbuckles and truss tighteners shall be fabricated of commercial quality steel, malleable iron, or wrought iron and shall be galvanized as provided in Section 75 1.05, "Galvanizing." The truss tighteners shall have a strap thickness of not less than 1/4 inch.

C. Portland cement concrete for metal post footings and for deadmen shall be Class A portland cement concrete per the Standard Specifications. Concrete footings shall be neatly and evenly crowned slightly above finished grades and all concrete shall be cleaned from all posts.

PART 3 EXECUTION

3.1 POSTS

A. Auger holes for post footings in firm undisturbed or compacted soil. Holes for new line post footings shall be sized as shown on the Drawings. Holes for terminal and gateposts shall be sized as shown on the Drawings.

B. Line posts shall be spaced at not more than 10-foot intervals, measured from center to center of posts. Posts shall be set plumb to the ground surface and in straight lines.

C. All posts shall be set in concrete footings conforming to the schedule on the plans. Top of footings shall be crowned to shed water.

D. End, latch and corner posts shall be braced to the nearest line post. At the Contractor's option, bracing shall be accomplished either with diagonal braces used as compression members or with horizontal braces used as compression members and 3/8-inch steel truss rods used as tension members. Gate posts shall be braced to the nearest line post with a horizontal brace used as a compression member and 3/8-inch steel truss rods as tension members. Each 3/8-inch steel truss rod shall be equipped with a turnbuckle or truss tightener with tensile strength equal to the truss rod. Line posts shall be braced horizontally and trussed in both directions at intervals not to exceed 1,000 feet, except that this bracing and trussing may be omitted when the fabric is installed by stretching with equipment.

3.2 FABRIC

A. The fabric shall be stretched and securely fastened to the posts, and between posts the top and bottom edges of the fabric shall be fastened to the rails.

B. The fabric shall be fastened to end, latch, corner, and gate posts with 1/4 inch by 3/4-inch stretcher bars and not less than 1/8 inch by 3/4-inch stretcher bar bands spaced at one-foot intervals. The fabric shall be fastened to line posts with tie wires or post clips and to rails with tie wires. The fasteners shall be spaced at approximately 14 inches on line posts and at approximately 18 inches on rails. Wire ties shall be given at least one complete turn. Hog rings shall be closed with ends overlapping.

C. Chain link fence fabric specified for the fence shall be attached to the gate frame by the use of stretcher bars and tie wires as specified for fence construction, and suitable tension connectors shall be spaced at approximately one-foot intervals.

3.3 GATES

A. The gates shall be hung by at least 2 steel or malleable iron hinges not less than 3 inches in width, so designed as to securely clamp to the gate post and permit the gate to be swung back against the fence. The bottom hinge shall have a socket to take the ball end of the gate frame.

B. Gates shall be provided with a combination steel or malleable iron catch and locking attachment of approved design which will not rotate around the latch post. Stops to hold gates open and a center rest with catch shall be provided where required. Gates shall be equipped with ADA access hardware were shown on plans

C. Install gates plumb, level, and secure for full opening without interference. Adjust hardware for smooth operation and lubricate where necessary. After the Engineer's approval of operation, drill, tap, and setscrew or spot-weld and paint all hinges and latch hardware to prevent rotation.

END OF SECTION 323113

SECTION 323234
TECHNICAL SPECIFICATIONS
FOR HILFIKER M. S. E. SYSTEM
(Hot Dipped Galvanized Wire)

1.0 DESCRIPTION

This work shall consist of a **Gabion Faced Welded Wire Retaining Wall**, Mechanically Stabilized Earth Retaining Wall [MSE] constructed in accordance with these specifications and in reasonably close conformity with the lines, grades, design and dimensions shown on the plans or established by the Owner's Engineer.

2.0 MATERIALS

The Contractor shall make his own arrangements to purchase all M.S.E. materials, including wire mesh reinforcement mats, backing materials, and all necessary incidentals from Hilfiker Retaining Walls, 1902 Hilfiker Lane, Eureka, CA 95503-5711, ph. 707/443-5093; www.hilfiker.com; info@hilfiker.com.

2.1 Wire Reinforcement and Cap Mesh

Welded wire fabric for Gabion Basket facing shall be formed by a welded wire interlocking basket backfilled with approved stone cobble. The reinforcing mesh shall be shop fabricated of cold drawn steel wire and shall be welded into the finished mesh fabric conforming to the minimum requirements of ASTM A-1064, with a yield strength minimum of 450 MPa [65 ksi]. Welded Wire Mesh for the wall shall be as per project specifications, and will be hot dip galvanized (2.0 oz./SF, ASTM A-123; 605 g/m^2). Any damage done to the mesh galvanization prior to installation shall be repaired in an acceptable manner and in a galvanized coating comparable to that provided.

2.2 Backing Materials

2.2.1 Backing Mats

Where required, as shown on the plans, steel backing mat shall be W5 vertical x W2.5 horizontal minimum (.2582" [6.6 mm] x .178" [4.5 mm] nom. dia.) welded wire fabric meeting ASTM A-1064 and hot dip galvanized (2.0 oz./SF, ASTM A-123; 605 g/m^2) in accordance with paragraph 2.1.

2.2.2 Hardware Cloth

Where required, as shown on the plans, 20-Gauge metallic hardware cloth screen, or 23-Gauge PVC coated (Brown or Green) hardware cloth screen with openings not exceeding ¼ inch (6.4 mm) and a roll width of 26-inches. The hardware cloth screen shall be in accordance with ASTM A-740 and shall be placed between the backfill and steel backing mat. A minimum vertical lap of 2" and horizontal lap of 1" must be maintained to retain the wall backfill.

2.2.3 Filter Fabric

Where required, as shown on the plans, geotextile filter fabric shall be utilized to retain the soil.

3.0 SELECT GRANULAR BACKFILL MATERIALS

As shown on the plans, select granular backfill materials for the **WWW** wall structure shall be reasonably free from organic and otherwise deleterious materials and shall conform to the following gradation limits as determined by ASTM D-422:

Sieve Designation	Percent by Weight Passing Standard Sieves (AASHTO T 27 & T 11)
6 inches (152.4 mm)	100
3 inches (76.2 mm)	100 - 75
No. 200 (75 µm)	0 - 15

The backfill shall conform to all of the following additional requirements:

A. The Plasticity Index (P.I.), as determined by ASTM D-4318 (AASHTO T 90), shall not exceed 6.

B. The fraction finer than 15 microns (0.015 mm), as determined by ASTM D-422 (AASHTO T-88) shall not exceed 15 percent.

C. The material shall exhibit an angle of internal friction of not less than 34 degrees, as determined by the standard direct shear test ASTM D-3080-72 (AASHTO T-236), utilizing a sample of the material compacted to 90% percent of ASTM D-1557-92. No testing is required for backfill where 80 percent of the material is greater than ¾ inch (19mm). Before construction begins, the borrow selected shall be subject to show conformance with this frictional requirement.

In addition, backfill materials shall also meet the following corrosion requirements:

Resistivity	≥ 3000 OHM-cm (min)	AASHTO T 288
pH	5.0 to 10.0, inclusive	AASHTO T 289
Chlorides	≤ 100 mg/kg (ppm)	AASHTO T 291
Sulfates	≤ 200 mg/kg (ppm)	AASHTO T 290
Organic Content	<1%	AASHTO T267-86

3.1 Acceptance of Material

The Contractor shall furnish to the Owner's Engineer a Certificate of Compliance certifying that the select granular backfill material complies with this section of the specifications. A

copy of all test results performed by the Contractor, which are necessary to assure compliance with the specifications, shall also be furnished to the Owner's Engineer and the MSE supplier.

The frequency of sampling of Select Granular Backfill necessary to assure the above-mentioned requirements shall be directed by the Owner's Engineer.

Backfill not conforming to this specification shall not be used without written consent of the Engineer.

3.2 Free Draining, Permeable Backfill

If the M. S. E. will be subject to water inundation, the following permeable, free-draining backfill material shall be used:

Sieve Designation	Percent by Weight Passing Standard Sieves (AASHTO T 11 and T 27)
6" (76 mm)	100
¾ " (19 mm)	50 - 90
No. 4 (4.75 mm)	20 – 50
No. 200 (75 μm)	0 - 2

4.0 CONSTRUCTION REQUIREMENTS

4.1 Wall Excavation

Wall excavation shall be in accordance with the requirements of the Project specifications and in reasonably close conformity with the limits and construction stages shown on the plans. All excavation cuts and slopes shall be in accordance with governing safety regulations.

4.2 Foundation Preparation

The foundation for the structure shall be graded level for a width equal to or exceeding the length of the reinforcement mat or as shown on the plans. Prior to wall construction, the foundation, if not in rock, shall be compacted, as directed by the Owner's Engineer.

Any unsuitable foundation material below the reinforced soil volume, as determined by the Owner's Engineer, shall be excavated for the full length of mat reinforcements, and to a depth as directed by the Owner's Engineer. Excavated unsuitable material shall be replaced as directed by the Owner's Engineer.

The maximum calculated applied bearing pressure at the foundation level is as shown on the elevation view for each wall. It is the responsibility of the Owner's Engineer to determine that this calculated applied bearing pressure is allowable for that location.

4.3 M.S.E. Wall Erection

Standard wire mesh reinforcement mats, and applicable facing materials, shall be placed in 24" successive horizontal lifts in the sequence shown on the plans as backfill placement proceeds. Each standard lift must have the ability to compress a minimum of 2" without creating any outward bulge of the facing elements. Vertical tolerance (plumbness) and horizontal alignment tolerance shall not exceed two (2) inches (51mm) when measured at the junction of the wire facing and soil reinforcement along a 10-foot (3 m) straight edge.

The overall vertical tolerance of the wall (top and bottom) after construction shall not exceed one (1) inch (25 mm) per ten (10) feet (3 m) of wall height, unless the wall design requires a battered facing. For battered facing structures, the overall tolerance from the theoretical battered locations shall not exceed one-half (1/2) inch (13 mm) per ten (10) feet (3 m) of battered wall height.

4.4 Backfill Placement

Backfill placement shall closely follow erection of each course of reinforcement mats. Backfill shall be placed in such a manner as to avoid any damage or disturbance to the wall materials or misalignment of the facing. Any wall materials, which become damaged or disturbed during backfill placement, shall be either removed and replaced at the Contractor's expense or corrected, as directed by the Owner's Engineer. The Contractor, at their expense, shall correct any misalignment or distortion of the wall facing due to placement of backfill outside the limits of this specification.

Backfill shall be compacted to 95 percent of AASHTO T 99 method C or D, with oversize correction, at optimum moisture content (±2%).

The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer. Backfill material shall have a placement moisture content equal to or within two percentage points of optimum moisture content (W_{opt} ±2%). Backfill material with placement moisture content in excess or less than W_{opt} ±2% shall be removed and reworked until the moisture content is uniformly acceptable throughout the entire lift. The Contractor shall decrease the percentage of deviation from optimum moisture, if necessary, to obtain the specified density. The optimum moisture content shall be determined in accordance with AASHTO T 99 Standard Proctor Method A, with coarse particle correction according to AASHTO T 224.

Backfill shall be placed in complete horizontal lifts. The maximum lift thickness after compaction shall not exceed twelve (12) inches (305 mm). The Contractor shall decrease this lift thickness, if necessary, to obtain the desired density.
Compaction within three (3) feet (1 m) of the backface of the wall facing shall be achieved by at least three (3) passes of a lightweight mechanical tamper, roller or vibratory system. Soil density tests are not generally required within this area.

At the end of each day's operation, the Contractor shall slope the last level of backfill away from the wall facing to rapidly direct run-off of rainwater away from the wall face. In addition, the Contractor shall not allow surface run-off from adjacent areas to enter the wall construction.

5.0 METHOD OF MEASUREMENT

5.1 Payment will be per the bid schedule.

This information is proprietary to Hilfiker Retaining Walls, 1902 Hilfiker Lane, Eureka, CA 95503-5711, Telephone: 707-443-5093, Email: info@hilfiker.com.

HILFIKER RETAINING WALLS ARE COVERED BY ONE OR MORE OF THE FOLLOWING PATENTS:

3,631,682	4,068,482	4,329,089	
3,922,864	4,117,686	4,324,508	OTHER
243,697	4,051,570	4,343,572	PATENTS
243,613	4,266,890	4,391,557	PENDING
4,154,554	4,260,296	4,505,621	

Revision Date: Jun 12, 2012
w:\product info\3. specifications\product specs\www\www-hotdipped spec updated 6-12-12.doc

END SECTION 323234

329200
SEEDING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Seeding and mulching all disturbed areas.

B. Related Sections:

1. Section 312200 - Grading

2. Section 312500 – Erosion and Sedimentation Controls

1.2 SUBMITTALS

A. Per Section 013300 - Submittals

B. Product Data: All items proposed to be provided under this Section.

C. Manufacturer's Certificate: Certificate of compliance with these Specifications.

1.3 QUALITY ASSURANCE

A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Seed: Conform to all Federal, State, Tribal, and local laws.

1. Deliver to site each variety of seed individually packaged and tagged to show name, net weight, origin, and lot number.

C. Fertilizer: Conform to State and local fertilizer laws.

PART 2 PRODUCTS

2.1 PRODUCT HANDLING

A. At time of delivery, furnish the Engineer invoices of all materials received in order that application rates may be verified/determined.

B. Immediately remove from the site materials which do not comply with the specified requirements, and promptly replace with materials meeting the specified requirements.

2.2 FERTILIZER

A. Provide commercial balanced 10-10-10 fertilizer delivered to the site in sealed bags labeled with the manufacturer's guaranteed analysis.

2.3 GRASS SEED

A. Provide grass seed which is:

1. Free from noxious weed seeds, and re-cleaned;
2. Grade A recent crop seed;
3. Treated with appropriate fungicide at time of mixing;
4. Delivered to the site in sealed containers with dealer's guaranteed analysis.

2.6 WOOD CELLULOSE FIBER

A. Provide wood chip particles manufactured particularly for discharging uniformly on the ground surface when dispersed by a hydraulic water sprayer.

B. Material to be heat processed so as to contain no germination or growth inhibiting factors.

C. It shall be dyed (non-toxic) an appropriate color to facilitate metering.

2.7 STRAW MULCH

A. Provide straw or hay material.

1. Straw to be stalks of wheat, rye, barley or oats;
2. Hay to be timothy, alfalfa, pea vine, or Bermuda.

B. Material to be reasonably dry and reasonably free from mature seed bearing stalks, roots, bulblets, Johnson Grass, Nut grass, Wild Onion, scotch broom, bramble brush, and other noxious weeds.

2.8 EXCELSIOR FIBER MULCH

A. To consist of six (6) inches, average length wood fibers cut from sound, green timber.

B. Make cut in such a manner as to provide maximum strength of fiber, but at a slight angle to natural grain of the wood.

PART 3 EXECUTION

3.1 GENERAL

A. Seed following areas immediately upon completion of their construction:

1. Slopes greater than four horizontal to one vertical;
2. Utility rights-of-way adjacent to stream banks.

B. Areas ready for planting between August 1 and February 28 shall be planted with a temporary cover in accordance with Schedule No. 2. At the acceptable seasons for planting under Schedule No. 1, the turf previously seeded under Schedule No. 2 shall be destroyed by reworking the soil and re-seeded in accordance with Schedule No. 1 as specified herein.

3.2 SEEDING SCHEDULES

A. Mixtures of different types of seed for the various schedules shall be weighed and mixed in proper proportions in the presence of the Engineer.

B. Schedule No. 1 - Permanent Seeding - Planting dates March 1 to August 15:

Common Name of Seed	Pounds / Acre
Browntop Millet	15
Hulled Bermuda	10
Carpetgrass	25

C. Schedule No. 2 - Temporary Seeding - Planting dates August 16 - February 28:

Common Name of Seed	Pounds / Acre
Rye Grain	30
Un-hulled Bermuda	20

3.3 PREPARATION

A. Bring all areas to proper line, grade and cross section indicated on the plans.

B. Repair erosion damage prior to commencing seeding operations.

C. Loosen seed bed to minimum depth of 3 inches.

D. Remove all roots, clods, stones larger than 2 inches in any dimension, and other debris.

3.4 APPLICATION OF FERTILIZER

A. Spread uniformly over areas to be seeded at:

1. Rate of 1,000 lbs per acre;
2. Use approved mechanical spreaders.

B. Mix with soil to depth of approximately 3 inches.

3.5 SEEDING AND MULCHING

A. General:

1. Perform seeding during the periods and at the rates specified in the seeding schedules;
2. Do not conduct seeding work when ground is frozen or excessively wet;
3. Produce satisfactory stand of grass regardless of period of the year the Work is performed.

B. Seeding, slopes steeper than four horizontal to one vertical:

1. Conform to Methods EA, WF or WCF as specified hereinafter;
2. Method EA (Emulsified Asphalt):
    a. Sow seed not more than 24 hours after application of fertilizer;
    b. Use mechanical seed drills on accessible areas, rotary hand seeders, power sprayers, etc. may be used on steep slopes or areas not accessible to seed drills;
    c. Cover seed and lightly compact with cultipacker if seed drill does not compact soil;
    d. Within 24 hours following compaction of seeded areas, uniformly apply 0.2 gallons per square yard of emulsified asphalt over the seeded area.
3. Method WF (Excelsior Fiber Mulch):
    a. Sow seed as specified for Method EA.;
    b. Within 24 hours following covering of seeds, uniformly apply excelsior fiber at the rate of 100 pounds per 1000 square feet;
    c. Material may be applied hydraulically or dry. If applied dry, it shall be thoroughly wetted immediately following placing;
    d. Seeded areas to be lightly rolled to form a tight mat of the excelsior fibers.
4. Method WCF (Wood Fiber Mulch):
    a. Apply seed, fertilizer and wood fiber mulch using hydraulic equipment;
    b. Equipment to have built-in agitation system with capacity to agitate, suspend and homogeneously mix a slurry of the specified amount of fiber, fertilizer, seed and water;
    c. Minimum capacity of slurry tank: 1000 gallons;
    d. Apply fiber mulch at rate of 35 pounds per 1000 sq. ft.;

    e. Regulate slurry mixture so that amounts and rates of application will result in uniform application of all materials at not less than the specified amounts;
    f. Apply slurry in a sweeping motion, in an arched stream, so as to fall like rain, allowing the wood fibers to build upon each other;

g. Use color of wood pulp as guide, spraying the prepared seed bed until a uniform visible coat is obtained.

C. Seeding, slopes equal to or flatter than four horizontal to one vertical:

1. Sow seed as specified for Method EA, steps a thru c;
2. Apply straw or hay mulch at the rate of 100 pounds per 1000 square feet uniformly to the seeded area. Mulch may be applied by hand, by mechanical spreaders, or by blowers;
3. Hold mulch in place with a tack coat of emulsified asphalt, applied at the rate of 0.2 gallons per square yard.

3.6 MAINTENANCE

A. Maintain all seeded areas in satisfactory condition until final acceptance of the Work.

B. Areas not showing satisfactory evidence of germination within six weeks of the seeding date shall be immediately reseeded, fertilized and/or mulched.

C. Repair any eroded areas.

D. Mow as necessary to maintain healthy growth rate until final acceptance of the Work.

3.7 ACCEPTANCE

A. Permanently seeded areas under Schedule No. 1 will be accepted when the grass attains a height of two inches.

B. No acceptance will be made of temporary seeded areas under Schedule No. 2. Re-work and re-seed those areas in accordance with Schedule No. 1.

END OF SECTION 329200

DIVISION 33
UTILITIES

SECTION 331100
WATER UTILITY DISTRIBUTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Pipe, fittings, hardware, appurtenances for domestic water mains, service lines, and typical fire suppression.

1.2 MEASUREMENT AND PAYMENT

A. **Distribution Main:** paid per Section 004100 per Linear Foot actually installed and field verified. Work includes all labor, materials, and equipment necessary to install water distribution facilities including connections, control valves, and other appurtenances.

B. **Gate Valve and Box:** Incidental to installation of water mains – no separate payment will be made. Includes excavation, gate valve, gate valve and valve box lid keys, box, thrust blocks, protection posts, backfilling, as-builts, site cleanup, and other appurtenances as necessary. Gate valves shall be installed at locations shown on the project plans.

C. **Miscellaneous Piping:** Paid as a Unit. Includes all other piping as shown on the project plans including piping to and from control building to instrumentation, piping to and from backwash tank, chemical feed lines, and drains to the sludge pond. Work shall include all excavation, bedding, pipe, backfilling, connections and valves necessary for operation.

D. Measurement and payment for water services shall be per service as per the bid schedule.

1.3 RELATED SECTIONS

A. Division 31.

1.4 REFERENCES

A. ASTM D2239 - Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Outside Diameter.

B. ASTM D2466 – Poly (VinylChloride) (PVC) Plastic Pipe (SDR-PR)

C. AWWA B300 - Standard for Hypochlorites.

D. AWWA B301 - Standard for Liquid Chlorine.

E. AWWA C651 - Standards for Disinfecting Water Mains.

1.5 SUBMITTALS

A. Product and manufacturer data.

B. Test Reports: Indicate results compared to specified requirements.

1.6 PROJECT RECORD DOCUMENTS

A. Disinfection report:

1. Type and form of disinfectant used.
2. Date and time of disinfectant injection start and time of completion.
3. Test locations.
4. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.
5. Date and time of flushing start and completion.
6. Disinfectant residual after flushing in ppm for each outlet tested.

B. Bacteriological report:

1. Date issued, project name, and testing laboratory name, address, and telephone number.
2. Time and date of water sample collection.
3. Name of person collecting samples.
4. Test locations.
5. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.
6. Coliform bacteria test results for each outlet tested.
7. Certification that water conforms, or fails to conform, to bacterial standards of EPA.
8. Copies of all reports shall be supplied to the Engineer within 48 hours of test completion.

1.7 QUALITY ASSURANCE

A. Perform work in accordance with AWWA C651.

B. Submit name of EPA certified laboratory.

C. Submit bacteriologist's signature and authority associated with testing.

PART 2 PRODUCTS

2.1 WATER PIPE

A. Manufacturers: J-M “Blue Brute”, or equal.

B. PVC Pipe: AWWA C900, elastomeric-gasket couplings, Class 200.

1. Fittings: AWWA C111, rubber-gasket joints, Ductile-Iron
2. Joints: ASTM D3139 compression gasket ring.
3. Trace Wire: Magnetic detectable conductor, plastic covering, imprinted with “Water Line” in large letters.

C. PVC Pipe: ASTM D2241, SDR-21 or 26 as shown on the drawings or bid schedule:

1. Fittings: ASTM D2466, PVC.
2. Joints: ASTM D2855, solvent weld.
3. Trace Wire: Magnetic detectable conductor, plastic covering, imprinted with “Water Line” in large letters.

D. HDPE Pipe: AWWA C906, heat fusion butt welds or mechanical joints, Class 200.

1. Fittings: AWWA C111, rubber-gasket joints, Ductile-Iron
2. Joints / Fittings: seamless heat fusion butt welds
3. Trace Wire: Magnetic detectable conductor, plastic covering, imprinted with “Water Line” in large letters or “Raw Water Line” in large letters for raw water lines.

E. Ductile Iron Pipe: AWWA C151

1. Fittings: AWWA C111
2. Joints: mechanical joints, grip ring, or approved other

2.2 GATE VALVES

A. Manufacturers: American Darling, Mueller, Clow, or Waterous, or equal.

B. Meet or exceed either AWWA C509 or C515, resilient seated gate valves 2 inch through 12 inch NPS, ductile iron body, trim, non-rising stem with square nut, single wedge, mechanical joint, flanged, or slip-on ends as specified in drawings, control rod, and extension box.

C. Furnish one valve key per contract or delivery order as applicable.

2.3 GATE VALVE BOX

A. Manufacturer: Tyler Pipe or equal, and compatible with the Owners' standards.

B. Cast iron and of the sliding type, sized for use with the appropriate valve. Box lid marked "WATER." Box shall extend from the body of the valve to the finished grade.

C. Furnish one valve box key per contract or delivery order as applicable.

2.4 ACCESSORIES

A. Thrust Blocks: Refer to Section 033000 (Cast-In-Place Concrete).

B. Marker Post

1. Manufacturers: Carsonite, Greenline

2. Flexible fiberglass, dual-sided.

3. Blue decal label on both sides as specified in drawing.

C. Protection Post

1. Black iron, 3 inch diameter, 6 feet long, buried 3 feet.

2. Cover each post at the top with 2 coats of yellow reflectorized paint or tape for a band 3 inches wide.

3. Metallic Tracer Tape, magnetic detectable conductor, plastic covering, imprinted with "Water Line" in large letters.

A.5CURB STOPS - UP TO 2 inch

A. Manufacturer: McDonald Model 6104 - 33 (substitutions permitted).

B. Brass body, TFE coated brass ball supported by two Buna-N-Seats, IPS ends, 300 PSI rating.

2.6 SADDLES

A. Manufacturers:
1. Ford Model S70 and S90
2. James Jones Co., Model J995 and J996
3. Substitutions: Will be permitted.

2.7 CORPORATION STOPS

A. Manufacturers:
   1. Ford FB1101
   2. James Jones Co., Model J1936
   3. Substitutions: Will be permitted.

2.8 COPPERSETTERS

A. Manufacturers:
   1. Ford Model VH72
   2. Substitutions: Will be permitted.

2.9 CURB BOXES

A. Manufacturer: McDonald, Minneapolis Pattern - with foot piece, 5½-inch (substitutions permitted).

2.10 WATER METERS

A. Manufacturer: Sensus SR-EB11 (substitutions permitted per approval).

2.11 WATER BOXES

A. Christy Model B9 Box with B9G Lid marked “WATER” (substitutions permitted).

2.12 DISINFECTION CHEMICALS

A. Chemicals: AWWA B300, Hypochlorite, and AWWA B301, Liquid Chlorine.

2.13 FLOW METERS

A. Manufacturer: Water Specialties or approved equal

B. Flow meters are to be installed at locations shown on the project plans. Flow meters are to be propeller meters sized per piping to accommodate a maximum flow rate of 175 gpm.

C. Total raw water intake and treated water outflow are to be measured with flow meters integral to the membrane plant.

2.14 DOUBLE-CHECK, BACKFLOW-PREVENTION ASSEMBLIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Ames Fire & Waterworks; a division of Watts Regulator Co.
b. Conbraco Industries, Inc.
c. FEBCO; SPX Valves & Controls.
d. Flomatic Corporation.
e. Watts Water Technologies, Inc.
f. Wilkins; a Zurn company.

B. Standard: AWWA C510.

C. Operation: Continuous-pressure applications, unless otherwise indicated.

D. Pressure Loss: 5 psi maximum, through middle 1/3 of flow range.

E. Body: Bronze for NPS 2 and smaller; cast iron with interior lining complying with AWWA C550 or that is FDA approved or steel with interior lining complying with AWWA C550 or that is FDA approved. Stainless steel for NPS 2-1/2 and larger.

F. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.

G. Configuration: Designed for horizontal, straight through flow.

H. Accessories: Ball valves with threaded ends on inlet and outlet of NPS 2 and smaller; OS&Y gate valves with flanged ends on inlet and outlet of NPS 2-1/2 and larger.

PART 3 EXECUTION

3.1 INSTALLATION - WATER SERVICE LINE

A. Coordinate with the Owner for connection of new water facilities to existing water distribution system. Contractor to install all other components of the new water system.

B. Excavate pipe trench according to Section 312300. Hand trim trench where necessary.

C. Establish elevations of buried piping for minimum of 36 inches of cover.

D. Connect the service line to the house plumbing with fittings or adapters manufactured for the conditions encountered to provide a strong, durable, watertight connection. Provide a gate valve and hose bib with vacuum breaker.

E. Set water meter and box in accordance with the drawings and the requirements of the public utility.

F. Backfill and compact according to Section 312300.

3.2 DISINFECTION AND BACTERIOLOGICAL TESTING

A. Examination

1. Verify that piping system has been cleaned, inspected, and pressure tested.
2. Perform scheduling and disinfecting activity with start-up, testing, adjusting, and demonstration procedures, including coordination with related systems.

B. Execution

1. Provide and attach required equipment to perform the work of this Section.
2. Inject treatment disinfectant into piping system.
3. Maintain disinfectant in system for 24 hours.
4. Flush, circulate, and clean until required cleanliness is achieved; use domestic water.

C. Pressure Test for Water Main

1. Notify Inspector forty-eight (48) hours prior to pressure testing.
2. Provide required equipment to perform pressure test. Pressure gages used in testing shall be graduated in no more than 5 PSI increments.
3. Pressure test PVC pipe 2-inches or greater in diameter for 2 hours based on the test section working pressure at the lowest point of elevation.

AVERAGE WORKING PRESSURE OF TEST SECTION	TEST PRESSURE
Less than 65 psi	100 psi
65 to 95 psi	140 psi
Greater than 95 psi	195 psi

4. Leakage rates are total leakage allowed for a two hour test per 50 pipe joints as follows:

Pipe Size	100 psi	140 psi	195 psi
2 inch	0.27 gal	0.32 gal	0.38 gal
4 inch	0.54 gal	0.64 gal	0.75 gal
6 inch	0.81 gal	0.96 gal	1.13 gal
8 inch	1.08 gal	1.28 gal	1.51 gal

5. Repair leaks and retest if leakage is above acceptable rates.
6. Leakage rates shall be adjusted proportionally for pipeline lengths greater than or less than 50 pipe joints.
7. The number of pipe joints being tested shall be calculated as the length of pipeline being tested divided by the standard pipe length used on the job, with no allowances for joints caused by the use of couplings or for joints at fittings.

END OF SECTION 331000

SECTION 331216
ALTITUDE CONTROL VALVE

PART 1 GENERAL

DESCRIPTION

This section specifies an off-grid, hydraulically operated, single-acting altitude control valve used to maintain a maximum water level in potable water storage tanks without external power.

SUBMITTALS

Refer to Section 013300 for additional submittal guidelines. Submit the following:

- Product data, including dimensions, materials, performance curves, and operating instructions.
- Shop drawings showing valve configuration, connections, and accessories.
- Manufacturer's certifications of NSF/ANSI 61 and 372 compliance.
- Factory test reports and maintenance manuals.

QUALITY ASSURANCE

- Manufacturer shall have a minimum of five years' experience in manufacturing control valves for potable water systems.
- Valves shall be certified in accordance with NSF/ANSI 61 and NSF/ANSI 372 standards.

CODES, ORDINANCES, AND REGULATIONS

- Perform all work in compliance with applicable Federal, State, County, and local regulations.

RELATED SECTIONS

- Division 33 – Utilities.

PART 2 PRODUCTS

GENERAL

Provide a hydraulically operated, single-acting altitude valve for potable water storage tanks, suitable for off-grid use, fully automatic, and pilot-controlled.

VALVE DESCRIPTION

- Valve Size: 8-inch nominal diameter.
- Operation: Hydraulically actuated using static tank head pressure.
- Configuration: Single-acting, one-way fill, closes at preset tank level.
- Pressure Rating: 30 to 150 psi (standard); up to 250 psi (optional).
- Pilot Control: Factory set, field-adjustable altitude pilot.

MATERIALS

- Body and Cover: Ductile iron conforming to ASTM A536.
- Trim: Stainless Steel 316.
- Interior Coating: NSF-61 certified epoxy, fusion bonded.
- Diaphragm: Buna-N, NSF-61 compliant.

ACCESSORIES

- Inlet and outlet pressure gauges.
- Manual isolation valves.
- Position indicator.
- Optional air release valve.

ACCEPTABLE MANUFACTURERS

- Cla-Val Model 210-01.
- GA Industries Figure 5320.
- Watts LFM127-8.

PART 3 EXECUTION

INSTALLATION

- Install valve in accordance with manufacturer’s instructions and approved shop drawings. Ensure accessibility for inspection and maintenance.

FIELD TESTING

- Verify valve performance in situ to ensure proper open/close operation at designated tank water levels.

FIELD QUALITY CONTROL

- Field inspections shall confirm compliance with all specifications.

END OF SECTION 436100

SECTION 331300
DISINFECTION AND BACTERIOLOGICAL TESTING OF WATER MAIN SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Disinfection of water mains.

B. Testing and reporting results.

1.2 RELATED SECTIONS

A. Section 331100 - Water utility distribution.

1.3 REFERENCES

A. AWWA B300 - Standard for Hypochlorites.

B. AWWA B301 - Standard for Liquid Chlorine.

C. AWWA C651 - Standards for Disinfecting Water Mains.

1.4 SUBMITTALS FOR INFORMATION

A. Test Reports: Indicate results compared to specified requirements.

1.5 PROJECT RECORD DOCUMENTS

A. Disinfection report:

1. Type and form of disinfectant used.

2. Date and time of disinfectant injection start and time of completion.

3. Test locations.

4. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.

5. Date and time of flushing start and completion.

6. Disinfectant residual after flushing in ppm for each outlet tested.

B. Bacteriological report:

1. Date issued, project name, and testing laboratory name, address, and telephone number.

2. Time and date of water sample collection.

3. Name of person collecting samples.

4. Test locations.

5. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.

6. Coliform bacteria test results for each outlet tested.

7. Certification that water conforms, or fails to conform, to bacterial standards of State of California.

8. Copies of all reports shall be supplied to the Owner or Owners' Representative within 48 hours of the test completion.

1.6 QUALITY ASSURANCE

A. Perform work in accordance with AWWA C651.

B. Submit name of State of California certified laboratory.

C. Submit bacteriologist's signature and authority associated with testing.

PART 2 PRODUCTS

2.1 DISINFECTION CHEMICALS

A. Chemicals: AWWA B300, Hypochlorite, and AWWA B301, Liquid Chlorine.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that piping system has been cleaned, inspected, and pressure tested.

B. Perform scheduling and disinfecting activity with start-up, testing, adjusting, and demonstration procedures, including coordination with related systems.

3.2 EXECUTION

A. Provide and attach required equipment to perform the work of this Section.

B. Inject treatment disinfectant into piping system.

C. Maintain disinfectant in system for 24 hours.

D. Flush, circulate, and clean until required cleanliness is achieved; use domestic water.

3.3 PRESSURE TEST FOR WATER MAIN

A. Notify Inspector 48 hours prior to pressure testing.

B. Provide required equipment to perform pressure test. Pressure gages used in testing shall be graduated in with no more than 5 PSI increments.

C. Pressure test PVC pipe 2-inches or greater in diameter for 2 hours based on the test section working pressure at the lowest point of elevation.

AVERAGE WORKING PRESSURE OF TEST SECTION	TEST PRESSURE
Less than 65 psi	100 psi
65 to 95 psi	140 psi
Greater than 95 psi	195 psi

D. Leakage rates are total leakage allowed for a two hour test per 50 pipe joints as follows:

Pipe Size	100 psi	140 psi	195 psi
4 inch	0.54 gal	0.64 gal	0.75 gal
8 inch	1.15 gal	1.22 gal	1.45 gal
12 inch	1.75 gal	2.14 gal	2.62 gal

E. Repair leaks and re-test if leakage is above acceptable rates.

F. Leakage rates shall be adjusted proportionally for pipeline lengths greater than or less than 50 pipe joints.

G. The number of pipe joints being tested shall be calculated as the length of pipeline being tested divided by the standard pipe length used on the job, with no allowances for joints caused by the use of couplings or for joints at fittings.

END OF SECTION 331300

SECTION 33400
STORMWATER FACILITIES

PART 1: GENERAL

1.1 Description

A. This section includes Polyethylene stormwater pipe and drop inlets used for transfer of stormwater as well as vegetated bio-swales.

1.2 Measurement & Payment

A. Polyethylene Drainage Pipe: Paid by the Linear Foot. Includes trench excavation, supply and placement of bedding material, hand trimming, pipe, fittings, hydrostatic testing, backfilling, as-builts, site cleanup, and all appurtenances not otherwise specified in the bid schedule.

B. Drop Inlets: paid per each installed, includes excavation, supply and installation of bedding material, connection to drainage pipe, grouting, backfilling, and all other appurtenances not otherwise specified on the bid schedule.

C. Vegetated Bio-swale: Paid by the Linear Foot. Includes all excavation, shaping, lining, seeding, and all other aspects and pertinent components and practices needed to completely establish such facilities in the locations, sizing, and to grades provided.

1.3 Related Sections

A. Section 022100: Surveys and Construction Staking

B. Division 31: Earthwork

C. Division 32: Exterior Improvements

1.4 References

A. ASTM D2239 - Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Outside Diameter.

B. ASTM D3035 - Polyethylene Plastic Pipe (SDR-PR) Based on Controlled Outside Diameter

C. ASTM D3350 - Polyethylene Plastics and Fittings Materials.

D. AASHTO M294 - Corrugated Polyethylene Pipe, 12" diameter and larger.

E. AASHTO M306 - Drainage, Sewer, Utility, and Related Castings.

1.5 Quality Assurance

A. Pipe: Install in strict conformance with the manufacturer's recommended procedures and with worker health and safety in mind.

B. Drop Inlets: Install in strict conformance with the manufacturer's recommended procedures and with worker health and safety in mind.

1.6 Delivery, Storage, and Handling

A. Deliver, store, and protect products to site.

1.7 Submittals

A. Submit manufacturer's product data, installation guide, shop drawings, and standards for specified materials and equipment for piping, jointing material, drop inlets, frames, and covers as one package. Approval by Engineer must be obtained prior to installation.

B. Submit televised scoping inspection of installed storm drain pipes for Engineer review and approval.

C. Submit as-built of installed storm drain facility following construction and prior to request for final payment for applicable items.

PART 2: PRODUCTS

2.1 Polyethylene Pipe

A. Manufacturers: *Hancor, ADS,* or approved equal.

B. Polyethylene Pipe: AASHTO M294, TYPE S

1. Fittings: Bell and Spigot with rubber gasket, ADS Pro Link Ultra, WT Pipe, of Bell-Bell Couplers. Fittings shall be rotational or blow molded.

2. Joints: ASTM M252, Fabricated fittings shall be welded on the interior and exterior at all junction. Coupling Joints shall be corrugated to match the index in the pipe corrugations and in a width no less than three-quarters of the nominal pipe diameter. All couplings shall be manufactured to lap equally to a distance on each jointed pipe, to no less than the diameter of the pipe and shall provide a positive means of closure.

3. Pipe: ADS N12 or approved equal meeting ASTM F2648. Smooth interior wall,

annular or helical exterior corrugations.

4. Manning's "n" value equal to 0.012.

5. Material Properties: Material for pipe production shall be an engineered compound of virgin and recycled high density polyethylene conforming with the minimum requirements of cell classification 435420C (ESCR Test Condition B), as defined and described in the latest version of ASTM D3350, except that carbon black content should not exceed 4%.

2.2 Drop Inlets

A. Manufacturer: Hancor, ADS (for landscape zones), or approved equal.

a. Drop Inlet (Drain Basin): to be 2812AG 12" PVC basin.
b. Drop Inlet Grate: Standard H-20 12" hinged cast iron grate.

B. Manufacturer: Hilfiker, Concrete (for road frontage), or approved equal.

a. Drainage Inlet, Concrete Type GO Caltrans D74B , or approved equal/alternate.
b. Drainage Inlet Grate: Type 24 Caltrans.
c. Curb: Type E Caltrans A87A.

2.3 Vegetated Bioswale

A. Topsoil: per Section 320513.

B. Vegetation: per Section 329219.

PART 3: EXECUTION

3.1 Examination

A. Contractor shall verify final grades and elevations of all inlets prior to installation.

3.2 Preparation

A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, and remove burrs.

3.3 Bedding

A. Excavate pipe trench in accordance with Section 02200 (Excavating, Trenching and

Backfilling). Hand trim excavation for accurate placement of pipe to elevations indicated.

B. Backfill around sides and to top of pipe with bedding material and tamp in place.

3.4 Installation: Polyethylene Pipe

A. Route pipe in straight line.

B. Install pipe to allow for expansion and contraction without stressing pipe or joints.

C. Establish elevations of buried piping to ensure not less than 24 inches of cover.

D. Backfill per Section 02300: Earthwork.

E. Installation shall be in accordance with ASTM D2321 and manufacturer's published installation guidelines.

3.5 Televising Storm Drains.

A. New storm drains twelve inch (12") in diameter to thirty-six inch (36") in diameter shall be inspected by closed circuit television (CCTV) after completion of trench backfill and finished grading but prior to the placement of pavement or permanent trench resurfacing, to determine the existence and extent of any obstructions, structural deficiencies, or sags. Storm drains less than fifty feet (50') in length for a single run do **not** require televised inspection.

B. The Contractor shall perform televising. The Engineer reserves the right to re-televise any new storm drain work after placement of pavement or permanent trench resurfacing, but before acceptance by the Engineer, to determine the existence and extent of any foreign material or obstructions such as, but not necessarily limited to, cement grout, wood, rocks, sand, concrete, or pieces of pipe, and any structural deficiencies or sags precipitated by the permanent resurfacing operations or other Contract Work. The Contractor shall notify the Engineer a minimum of two (2) working days in advance of the anticipated date of televising.

C. Five (5) working days shall be allowed for the Engineer to review each individual video recording of each and every storm drain documented on that particular recording. In the event that any deficiencies or sags are discovered by the Engineer either by the Contractor's televising or the Engineer's re-televising, three (3) working days shall be allowed for the Engineer to determine whether the deficiencies or sags are repairable in place. If the Engineer determines that the deficiencies or sags are not repairable in place, the affected portion(s) shall be reconstructed in accordance with these Specifications.

D. The Contractor shall not be entitled to any additional working days due to delays resulting from the correction of any deficiencies or sags, either repairable or non-repairable in place, as determined by televised inspections.

3.6 Drop Inlet Installation

A. Excavate and set drop inlet on solid bearing, provide Class II aggregate base foundation compacted to a minimum of 95% relative compaction per ASTM D2922 as needed. Set basin in place and level prior to backfilling.

B. Adjust to design alignment and elevations provided.

C. Install F477 gasket into last corrugation of pipe for insertion into drain basin receiver.

D. Install outlet pipe(s). Seat outlet piping to full depth of basin receiver.

E. Backfill per Section 02300 (Earthwork).

F. Adjust finish grate elevation to meet levels of plan set. Basin grate elevation can be adjusted by either cutting basin to lower, or inserting manufacturer approved riser rings to elevate.

END OF SECTION 334000

SECTION 334200
DRAINGAGE FACILITIES

PART 1. GENERAL

1.1. SECTION INCLUDES

A. This section includes drainage pipe and drainage facilities to be installed.

1.2. MEASUREMENT

A. Measurement and payment to be per Section 004100 Bid Schedule.

1.3. RELATED SECTIONS

A. Division 31

1.4. REFERENCES

A. ASTM D1785 - Poly (VinylChloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
B. ASTM D2241 - Poly (VinylChloride) (PVC) Plastic Pipe (SDR-PR).
C. ASTM D2466 - Poly (VinylChloride) (PVC) Plastic Pipe Fittings, Schedule 40.
D. ASTM D2855 - Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.
E. ASTM D2239 - Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Outside Diameter.

1.5. QUALITY ASSURANCE

A. Pipe: Perform Work in accordance with manufacturer's recommended procedures.
B. Drop Inlets: Construct per the dimensions shown on the project drawings.

1.6. DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and protect products to site.

PART 2. PRODUCTS

2.1. HDPE PIPE

A. Manufacturers: Hancor or equal
B. HDPE Pipe: AASHTO M294, TYPE S
   1. Fittings: Bell and Spigot with rubber gasket, ADS Pro Link Ultra, WT Pipe, of Bell-Bell Couplers
   2. Joints: ASTM M252, Fabricated fittings shall be welded on the interior and exterior at all junction

3. Pipe: Smooth interior wall, corrugated polyethylene pipe
4. Pipe: ADS N-12 approved or equal

PART 3. EXECUTION

3.1. EXAMINATION

A. Contractor shall verify final grades and elevations of all inlets prior to installation.

3.2. PREPARATION

A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, and remove burrs.

3.3. BEDDING

A. Excavate pipe trench in accordance with Section 02300 (Earthwork). Hand trim excavation for accurate placement of pipe to elevations indicated.
B. Backfill around sides and to top of pipe with bedding material and tamp in place.

3.4. INSTALLATION – HDPE PIPE

A. Install in accordance with State of California, Department of Transportation, Standard Specifications July 2010, Section 64.
B. Route pipe in straight line
C. Install pipe to allow for expansion and contraction without stressing pipe or joints.
D. Establish elevations of buried piping to ensure not less than 24 inches of cover.

END OF SECTION 334200

DIVISIONS 34-39
-NOT USED-

DIVISION 40
PROCESS INTEGRATION

SECTION 409123
LEVEL SWITCH FLOAT TYPE WITH INTEGRAL SWITCH

PART 1 GENERAL

1. Function: Actuate contact at preset liquid level.
2. Type: Direct-acting float with an enclosed mechanical switch and integral cable.

Service:

1. Liquid: Domestic drinking water
2. Pressure: Atmospheric.
3. Temperature: 32° to 130°F.

Performance:

1. Setpoint: As shown on Plans or as directed by the owner's representative.
2. Differential: 1-inch maximum.

Features:

1. Entire Assembly: Watertight and impact-resistant.
2. Cable: Combination support and signal; length as necessary per mounting requirements.
3. Materials:
   a. Float: Chemical resistance polypropylene or other corrosion resistant material.
   b. Cable: Type SJO No. 18 to 2, neoprene or PVC jacket, rated 600 V.
   c. Clamps: Stainless steel.
4. Mounting: Pipe (or) suspended as shown on Plans.
   a. Pipe: Corrosion proof cable clamp for 1-inch pipe.
   b. Suspended: Necessary brackets and clamps for tank top; integral or attached weight assembly for stabilization. Weight assembly shall be stainless steel or zinc plated.

Signal Interface:

1. Switch: SPST or SPDT, arrangement as required.
2. Contact: Rated 4 A continuous at 120 VAC.

Manufacturers:

1. Anchor Scientific; Roto-Float.
2. Conery Mfg., Series 2900.
3. Or equal.

END OF SECTION 409123

DIVISIONS 41-48
-NOT USED-

FORMS

ATTACHMENTS