



**MARINA COAST WATER
DISTRICT**

**IMJIN LIFT STATION IMPROVEMENT
PROJECT**

CIP NO. OS-0205

DECEMBER 2019

CONTRACT DOCUMENTS FOR
IMJIN LIFT STATION IMPROVEMENT PROJECT

CIP NO. OS-0205

Marina Coast Water District
11 Reservation Road
Marina, California 93933

Board of Directors

Thomas P. Moore, President
Jan Shriner, Vice-President
Herbert Cortez
Peter Le
Matt Zefferman

Submitted 
Elise Ramirez, P.E. - Associate Engineer

Approved 
Mike Wegley, P.E. - District Engineer

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INVITATION TO BIDDERS

FOR THE ATTACHED CONSTRUCTION PROJECT ENTITLED: **IMJIN LIFT STATION IMPROVEMENT PROJECT**

Site Inspection and Questions

A mandatory pre-bid conference and site walk for this project is scheduled for Wednesday, January 22, 2020 at 11am. Mandatory pre-bid location is: 11 Reservation Road, Marina, CA 93933. Additional questions may be directed to MCWD on an individual basis. The deadline for questions is Tuesday, February 11, 2020 at 5pm PST.

Bid Opening

Bids will be received by the Marina Coast Water District (herein after referred to as "MCWD") at **11 Reservation Road, Marina CA 93933**, at 2 pm on Thursday, February 20, 2020, for the performance of the work described in the Bid and Contract Documents on file. **Bid Opening location is: 11 Reservation Road, Marina, CA 93933.**

All Bid and Contract Documents, including the bid forms, shall be obtained from MCWD.

The plans and specifications for this project are available from:

Marina Coast Water District
Attn: Stephenie Verduzco
2840 4th Avenue
Marina, CA 93933
831-883-5929 (phone)
831-384-0197 (fax)

The plans and specifications are also available for download at www.mcwd.org

Description of Work

The work as indicated in the project documents consist of all materials, labor, tools, equipment, apparatus, facilities, transportation and incidentals necessary to construct, furnish, deliver and install the following in general:

This Capital Improvement project consists of installation of new pumps, discharge pipes, valves, wet well, valve vault, electrical and control equipment, and various site improvements.

Payment will be made as described in the Instructions to Bidders, Section 2.01.

BONDS:

A Bid Bond is required.

A Payment Bond and a Performance Bond are required after the Notice of Award at the time of the delivery of executed counterparts of the Agreement to the Owner.

The right is reserved, as the interest of MCWD may require, to reject any or all bids, to waive any informality in bids, and to accept or reject any items of the bid. If the Contractor's bid is accepted, the Purchasing Agent will execute the Contract for and on behalf of the, as governed by Public Contract Code 22030 through 22045.

The bidder and any of his subcontractors must be licensed as a General Engineering Contractor with the Contractors State License Board of the State of California Department of Consumer Affairs. Bids will not be considered from contractors not licensed as a General Engineering Contractor unless they hold a specialty license for the specific classification(s) to be performed.

Public Works projects exceeding \$1,000.00 require the payment of the general prevailing rate of per diem wages, copies of which are on file at the State of California, Department of Consumer Affairs Office. (Labor Code 1770, et seq.).

The MCWD contact person assigned to this project is: Elise Ramirez, P.E. - Associate Engineer. All inquiries regarding the project shall be directed to MCWD at (831) 883-5930 (phone), (831) 384-0197 (fax), or eramirez@mcwd.org (e-mail). Requests for information will be received in writing until 5 p.m. PST on Tuesday, February 11, 2020.

MCWD anticipates awarding the contract to the successful Bidder on March 16, 2019. A pre-construction conference will be scheduled for early April 2020, with Notice to Proceed being granted in early May 2020.

END OF DOCUMENT

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ARTICLE 1 - DEFINED TERMS

1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

- A. *Issuing Office*—Marina Coast Water District, 2840 4th Avenue, Marina, CA 93933
- B. *Marina Coast Water District Standard Plans and Specifications for Construction of Domestic Water, Sewer and Recycled Water Facilities*, revised November, 2007.

ARTICLE 2 - COPIES OF BIDDING DOCUMENTS

2.01 Complete sets of the Bidding Documents stated in the Advertisement or Invitation to Bid may be obtained from Marina Coast Water District Engineering Officer, 2840 4th Avenue, Marina, CA 93933 at a rate of \$40 per hard copy and \$5 per soft copy. All checks for Bidding Documents are to be made payable to Marina Coast Water District.

2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not confer a license or grant for any other use.

ARTICLE 3 - QUALIFICATIONS OF BIDDERS

3.01 To demonstrate Bidder's qualifications to perform the Work, within five days of Owner's request, Bidder shall submit written evidence such as financial data, previous experience, present commitments, and such other data as may be called for below.

- A. The Bidder shall provide 3 or more projects that they have successfully completed in the last 10 years of like nature and equaling \$500,000 in total value. The Bidder shall provide the project name, owner representative and phone number. The projects listed shall be of similar scope and type (lift station) as the project identified in this document.

ARTICLE 4 - EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA AND SITE

4.01 *Subsurface and Physical Conditions* - See Supplementary Conditions, 4.02.C.

4.02 *Underground Facilities* - See Supplementary Conditions, 4.02.D

4.03 *Hazardous Environmental Condition* - See Supplementary Conditions, 4.06

4.04 NOT USED

4.05 On request, Owner will provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder

shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies. Bidder shall comply with all applicable Laws and Regulations relative to excavation and utility locates.

4.06 NOT USED

4.07 It is the responsibility of each Bidder before submitting a Bid to:

A. examine and carefully study the Bidding Documents, the other related data identified in the Bidding Documents, and any Addenda;

B. visit the Site and become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work; and become familiar with the conditions of permits and waivers. Contractor is responsible for any penalties incurred for noncompliance with these conditions. Contractor to be aware of the utility agencies involved in the project and shall coordinate with said agencies as necessary.

C. become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work;

D. carefully study all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in Paragraph 4.02 of the General Conditions;

E. obtain and carefully study (or accept consequences of not doing so) examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto;

F. agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents;

G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;

H. correlate the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents;

I. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder; and

J. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.

4.08 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given Engineer written notice of all conflicts, errors,

ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

ARTICLE 5 - PRE-BID CONFERENCE

5.01 A pre-Bid conference will be held at the time and location indicated in the Invitation to Bidders. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 6 - SITE AND OTHER AREAS

6.01 The Site is identified in the Bidding Documents. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Owner unless otherwise provided in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor.

ARTICLE 7 - INTERPRETATIONS AND ADDENDA

7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda faxed w/ receipt return required or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than five calendar days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

7.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner or Engineer.

ARTICLE 8 - BID SECURITY

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 10% (ten percent) of Bidder's maximum Bid price and in the form of a certified check or bank money order or a Bid bond (on the form attached) issued by a surety meeting the requirements of Paragraphs 5.01 and 5.02 of the General Conditions.

8.02 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may annul the Notice of Award and the Bid security of that Bidder will be forfeited. The Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Agreement or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be returned.

8.03 Bid security of other Bidders whom Owner believes do not have a reasonable chance of receiving the award will be returned within seven days after the Bid opening.

ARTICLE 9 - CONTRACT TIMES

9.01 The work shall be diligently prosecuted to substantial completion as defined in Section 14.04 of the General conditions in this document before the expiration of 180 Calendar days beginning on the day after MCWD has provided the contractor with a formal notice-to-proceed and will be completed and ready for final payment in accordance with Paragraph 14.07.B of the General Conditions within 30 calendar days after the date of Substantial Completion.

ARTICLE 10 - LIQUIDATED DAMAGES

10.01 Provisions for liquidated damages, if any, are set forth in the Agreement.

ARTICLE 11 - SUBSTITUTE AND "OR-EQUAL" ITEMS

11.01 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, or those substitute or "or-equal" materials and equipment approved by Engineer and identified by Addendum. The materials and equipment described in the Bidding Documents establish a standard of required type, function and quality to be met by any proposed substitute or "or-equal" item. No item of material or equipment will be considered by Engineer as a substitute or "or-equal" unless written request for approval has been submitted by Bidder and has been received by Engineer at least 15 days prior to the date for receipt of Bids. Each such request shall conform to the requirements of Paragraph 6.05 of the General Conditions. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. If Engineer approves any proposed item, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner.

ARTICLE 12 – SUBCONTRACTORS AND OTHERS

12.01 If the Supplementary Conditions require the identity of certain Subcontractors, individuals, or entities to be submitted to Owner in advance of a specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of all such Subcontractors, individuals, or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, individual, or entity if requested by Owner. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

12.02 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, individual, or entity so listed and against which Owner or Engineer makes no written objection

prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 6.06 of the General Conditions.

12.03 Contractor shall not be required to employ any Subcontractor, individual, or entity against whom Contractor has reasonable objection.

ARTICLE 13 - PREPARATION OF BID

13.01 The Bid Form is included with the Bidding Documents. Additional copies may be obtained from the Engineer.

13.02 All blanks on the Bid Form shall be completed by printing in ink or by typewriter and the Bid signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each Bid item listed therein.

13.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown below the signature.

13.04 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown below the signature.

13.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown below the signature.

13.06 A Bid by an individual shall show the Bidder's name and official address.

13.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown below the signature.

13.08 All names shall be typed or printed in ink below the signatures.

13.09 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.

13.10 The address and telephone number for communications regarding the Bid shall be shown.

13.11 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located or covenant to obtain such qualification prior to award of the Contract. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 14 - BASIS OF BID; COMPARISON OF BIDS

14.01 *Unit Price*

A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the Bid schedule as applicable. Each bid item will be a lump sum unit.

B. The total of all estimated prices will be the sum of the products of the estimated quantity of each item and the corresponding unit price. The final quantities and Contract Price will be determined in accordance with Paragraph 11.03 of the General Conditions.

C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.

14.02 The Bid price shall include such amounts as the Bidder deems proper for overhead and profit on account of cash allowances, if any, named in the Contract Documents as provided in Paragraph 11.02 of the General Conditions.

ARTICLE 15 - SUBMITTAL OF BID

15.01 With each copy of the Bidding Documents, a Bidder is furnished one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the data as listed in Document 00435 – Bid Submittal Checklist.

15.02 A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the Advertisement or Invitation to Bid and shall be enclosed in an opaque sealed envelope plainly marked with the Project title, the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate envelope plainly marked on the outside with the notation **“BID ENCLOSED.”** A mailed Bid shall be addressed to the following: **Marina Coast Water District, 11 Reservation Road, Marina, CA 93933, Attention: District Engineer.**

ARTICLE 16 - MODIFICATION AND WITHDRAWAL OF BID

16.01 A Bid may be modified or withdrawn by an appropriate document duly executed in the manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.

16.02 If within 24 hours after Bids are opened, any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

ARTICLE 17 - OPENING OF BIDS

17.01 Bids will be opened at the time and place indicated in the Advertisement or Invitation to Bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 18 - BIDS TO REMAIN SUBJECT TO ACCEPTANCE

18.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.

19.02 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

19.03 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.

19.04 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, and other individuals or entities must be submitted as provided in the Supplementary Conditions.

19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, individuals, or entities to perform the Work in accordance with the Contract Documents.

19.06 If the Contract is to be awarded, Owner will award the Contract to the Bidder whose Bid is in the best interests of the Project.

ARTICLE 20 - CONTRACT SECURITY AND INSURANCE

20.01 Article 5 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it shall be accompanied by such bonds.

ARTICLE 21 - SIGNING OF AGREEMENT

21.01 When Owner gives a Notice of Award to the Successful Bidder (Form C510-1), it shall be accompanied by the required number of unsigned counterparts of the Agreement with the other Contract Documents, which are identified in the Agreement as attached thereto. Within 15 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner. Within ten days thereafter, Owner shall deliver one fully signed counterpart to Successful Bidder with a complete set of the Drawings with appropriate identification.

ARTICLE 22 - SALES AND USE TAXES – Not Used

ARTICLE 23 - RETAINAGE

23.01 Provisions concerning Contractor's rights to deposit securities in lieu of retainage are set forth in the Agreement.

ARTICLE 24 - CONTRACTS TO BE ASSIGNED – Not Used

ARTICLE 25 – PARTNERING – Not Used

END OF DOCUMENT

BID FORM

IMJIN LIFT STATION IMPROVEMENT PROJECT

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Designation of Insurance Agent or Broker

List of Project References

Stop Notice Information

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Prevailing Wage Statement

Bid Bond

Form of Proposal

ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

Marina Coast Water District
11 Reservation Road
Marina, CA 93933
Attention: District Engineer

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER’S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER’S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged.

<u>Addendum No.</u>	<u>Addendum Date</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.

D. Bidder has carefully studied, where available, all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in SC-4.02.

E. Bidder has obtained and carefully studied (or accepts the consequences for not doing so) all additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the

Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents to be employed by Bidder, and safety precautions and programs incident thereto.

- F. Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.
- G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- H. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.
- I. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.
- J. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.
- K. Bidder will submit written evidence of its authority to do business in the state where the Project is located not later than the date of its execution of the Agreement.

ARTICLE 4 – FURTHER REPRESENTATIONS

4.01 Bidder further represents that:

- A. this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over Owner.

ARTICLE 5 – BASIS OF BID

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

All specified cash allowances are included in the price(s) set forth below and have been computed in accordance with Paragraph 11.02 of the General Conditions and Section 01270 Measurement and Payment of the Technical Specifications.

Item No.	Description	Unit	Quantity	Unit Price	Total Item Price
1	Mobilization/demobilization	LS	1		
2	Traffic Control and Construction Area Signage	LS	1		
3	Temporary Sheeting, Shoring, and Bracing	LF	1		
4	Lift Station Improvements	LS	1		
5	Lift Station SCADA/MCC Allowance	ALW	1	\$25,000	\$25,000
	Sub-Total, Base Bid:				
	Alternate Items	LS	1		
6	Remove and Dispose Unsuitable Materials	Ton	25		
7	Imported Backfill Material	CY	25		
	Sub-Total, Alternate Items:				

Total bid schedule including ADDS/DEDUCTS:

Number: \$ _____

Words: _____

Unit Prices have been computed in accordance with Paragraph 11.03.B of the General Conditions and Section 01270 Measurement and Payment of the Technical Specifications.

Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

If the District awards this contract, selection shall be based on the lowest total Bid Price and qualified contractor.

ARTICLE 6 – TIME OF COMPLETION

- 6.01 The Work will be substantially complete as indicated in Article 9 of the Instruction to Bidders after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions, and will be completed and ready for final payment in accordance with Paragraph 14.07.B of the General Conditions as indicated in Article 9 of the Instruction to Bidders after the date of Substantial Completion.
- 6.02 Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the Contract Times.

ARTICLE 7 – ATTACHMENTS TO THIS BID

- 7.01 Reference 00435 – Bid Submittal Checklist for all items required for bid submittal.

ARTICLE 8 – DEFINED TERMS

- 8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 – BID SUBMITTAL

- 9.01 This Bid submitted by:

If Bidder is:

An Individual

Name (typed or printed): _____

By: _____ (SEAL)
(Individual's signature)

Doing business as: _____

A Partnership

Partnership Name: _____ (SEAL)

By: _____
(Signature of general partner – attach evidence of authority to sign)

Name (typed or printed): _____

A Corporation

Corporation Name: _____ (SEAL)

State of Incorporation: _____

Type (General Business, Professional, Service, Limited Liability): _____

By: _____
(Signature – attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

(CORPORATE SEAL)

Attest: _____
(Signature of Corporate Secretary)

Date of Qualification to do business in _____ [State Where Project is Located] is
____/____/____.

A Joint Venture

Name of Joint Venturer: _____

First Joint Venturer Name: _____ (SEAL)

By: _____
(Signature of first joint venture partner – attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Second Joint Venturer Name: _____ (SEAL)

By: _____
(Signature of second joint venture partner – attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

Bidder's Business address: _____

Phone: _____ Facsimile: _____

Submitted on _____, 20____.

State Contractor License No. _____. (If applicable)

END OF DOCUMENT

DESIGNATION OF SUBCONTRACTORS

IMJIN LIFT STATION IMPROVEMENT PROJECT

SUBMIT WITH BID

In compliance with the provisions of Section 4100-4113 of the Public Contract Code of the State of California, and any amendments thereof, and, if applicable, with the requirements of County relating to projects for the construction, improvement or repair of Public Works, the undersigned bidder has set forth below the name and location of the place of business of each subcontractor who will perform work or labor or render service to the undersigned in or about the construction of the work, and each subcontractor who, under subcontract, will specially fabricate and install a portion of the work or improvement according to detailed drawings contained in the plans and specifications, for such work to be performed under the Contract Documents to which the attached bid is responsive, and the portion of the work which will be done by each subcontractor and for each subcontract in excess of one half of one percent of the undersigned's total aggregate bid.

Name of SUBCONTRACTOR: _____
Division of Work: _____ Phone: _____
Location (address, city, zip): _____
Contractor License No.: _____ DIR Number: _____

Name of SUBCONTRACTOR: _____
Division of Work: _____ Phone: _____
Location (address, city, zip): _____
Contractor License No.: _____ DIR Number: _____

Name of SUBCONTRACTOR: _____
Division of Work: _____ Phone: _____
Location (address, city, zip): _____
Contractor License No.: _____ DIR Number: _____

Name of SUBCONTRACTOR: _____
Division of Work: _____ Phone: _____
Location (address, city, zip): _____
Contractor License No.: _____ DIR Number: _____

Name of SUBCONTRACTOR: _____
Division of Work: _____ Phone: _____
Location (address, city, zip): _____
Contractor License No.: _____ DIR Number: _____

Attach additional sheets, as needed.

COMPANY NAME: _____

By: _____
Print Name Signature Date

END OF DOCUMENT

DESIGNATION OF INSURANCE AGENT OR BROKER

IMJIN LIFT STATION IMPROVEMENT PROJECT

SUBMIT WITH BID

It is proposed that the following insurance agent/broker and insurance company will provide policies of insurance or insurance certificates as required by the bid documents.

Insurance Agent or Broker: _____

Street: _____

City, State and Zip: _____

Telephone: _____

Name of Insurance Company
Providing Coverage _____

Best's Key Rating Guide of at least A VII? Yes _____ No _____

It is proposed that the following bonding agent or surety will provide payment and performance bonds as required by the bid documents.

Bonding Agent or Broker: _____

Street: _____

City, State and Zip: _____

Telephone: _____

Name of Surety Company
Providing Bonds: _____

1. Admitted in California? Yes _____ NO _____
OR
Current Treasury Listed Surety (Federal Register)? Yes _____ NO _____
AND
Current A.M. Best B or better rating? Yes _____ NO _____
OR
Current Standard and Poors Rating of BB or better? Yes _____ NO _____

2. (in lieu of 1)

An admitted surety insurer which complies with the provisions of the code of Civil Procedure, Section 995.660*.

California Code of Civil Procedure Section 995.660 in summary, states that an admitted surety must provide 1) the original, or a certified copy of instrument authorizing the person who executed the bond to do so; 2) a certified copy of the Certificate of Authority issued by the Insurance Commissioner, 3) a certificate from county Clerk of Monterey County that Certificate of Authority has not been surrendered, revoked, canceled, annulled or suspended; 4) a financial statement showing the assets and liabilities of the insurer at the end of the quarter calendar year, prior to 30 days next preceding the date of the execution of the bond.

OR

3. In lieu of 1 and 2, a company of equal financial size and stability that is approved by the MCWD Insurance/Risk Manager.

By signing below, the bidder certifies that:

The above comply with the MCWD standards for liability insurers and sureties pursuant to Section II, Part A, paragraph 14 of these bid documents: Yes _____ NO _____. If "No", your bid is subject to rejection.

COMPANY NAME: _____

BY: _____
(Bidder's signature)

DATE: _____

END OF DOCUMENT

LIST OF PROJECT REFERENCES

IMJIN LIFT STATION IMPROVEMENT PROJECT

SUBMIT WITH BID

The Bidder shall provide three projects that they have successfully completed in the last ten years of like nature and equaling \$500,000 or more in total value. The Bidder shall provide the project name, owner representative and phone number. The projects listed shall be of similar scope and type as the project identified in this document (lift station).

	Project Name	Owner Representative	Owner Phone #	Contract Amount
1				
2				
3				

END OF DOCUMENT

STOP NOTICE INFORMATION

IMJIN LIFT STATION IMPROVEMENT PROJECT

SUBMIT WITH BID

PROJECT NAME: IMJIN LIFT STATION IMPROVEMENT PROJECT

CONTRACTOR'S NAME AND ADDRESS: _____

Reference: California Civil Code, Division 3, Part 4, Title 15, Chapter 4

The following is provided for the information of contractors, subcontractors and suppliers of labor, materials, equipment, and services under MCWD contracts, and is not intended as legal advice. Advice of legal counsel should be obtained to ensure compliance with legal requirements relating to public works stop notices.

WHERE TO FILE: All original stop notices and preliminary-20 day notices (if required by California Civil Code 53098) must be filed with the Marina Coast Water District, 11 Reservation Road, Marina, CA 93933.

STOP NOTICE CONTENTS: See California Civil Code 3103. written notice, signed and verified by the claimant and including information such as the kind of labor, equipment, materials or service furnished or agreed to be furnished by the claimant; the name of the person/entity to or for whom the same was done or furnished; the amount in value of that already done or furnished and/or agreed to be done or furnished. Blank stop Notice forms are commercially available.

WHO MAY SERVE STOP NOTICE: See California Code 53181. All persons furnishing labor, materials, equipment or services to the job (except the original contractor) and persons furnishing provisions, provender or other supplies.

HOW THE STOP NOTICE IS SERVED: See California Code S3103. Served by personal service, registered mail, or certified mail.

TIME FOR SERVICE: See California Civil Code 3184. Stop notices must be served before the expiration of 30 days after the recording of a Notice of Completion (sometimes referred to as a Notice of Acceptance) or Notice of Cessation, if such notice is recorded or if no Notice of Completion or Notice of Cessation is recorded, 90 days after actual completion or cessation.

NOTICE OF PUBLIC ENTITY (OWNER): See California Civil Code 3185. Provided that a stop notice claimant has paid to the Clerk of the Board of Supervisors the sum of \$2.00 at the time of filing a stop notice, the Clerk shall provide each stop notice claimant with notice of filing of a Notice of Completion or after the cessation of labor has been deemed a completion of a public work or after the acceptance of

completion, whichever is later, to each stop notice claimant, by personal service or registered or certified mail.

RELEASE OF STOP NOTICE: See California Civil Code 3196 and following. A stop notice can be released if the original contractor files a corporate surety bond with the Clerk of the Board of Supervisors, in the amount of 125% of the stop notice claim. Alternatively, the original contractor may file an affidavit pursuant to California Civil Code S3198, stating objections to the validity of the stop notice. A counter affidavit may be filed by the claimant pursuant to 53200 and a summary legal proceeding may be held pursuant to 3201 and following, to determine the validity of the stop notice. If no counter affidavit is filed, the stop notice funds shall be released. Alternatively, the Stop Notice claimant may file a Release in a form which substantially complies with California Civil Code 3262.

STOP NOTICE LAWSUIT: See California Civil Code 53210 through 3214. These sections provide that a stop notice is perfected only by the filing of a lawsuit. A lawsuit must be filed no sooner than 10 days after service of a stop notice and no later than 90 days after the expiration of the time for filing stop notices. Notice of suit must be given to the Clerk of the Board within 5 days after commencement. The Court has the discretionary right to dismiss the lawsuit if it is not brought to trial within two years.

I HEREBY ACKNOWLEDGE THAT I RECEIVED AND READ THE ABOVE STOP NOTICE INFORMATION AND IF I AM AWARDED THIS CONTRACT, I AGREE TO INCLUDE A COPY OF THIS PAGE IN ALL SUBCONTRACTS AND CONTRACTS FOR LABOR, MATERIALS, EQUIPMENT, AND SERVICES THAT I ENTER INTO FOR THIS PROJECT:

Bidder's Signature: _____ Date: _____

Bidder's Name and Title (Print): _____

END OF DOCUMENT

NON-COLLUSION DECLARATION TO BE EXECUTED BY BIDDER

IMJIN LIFT STATION IMPROVEMENT PROJECT

SUBMIT WITH BID

I, _____, am the
(name)

(Position Title) of _____,
(Company)

the party making the foregoing bid that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid; and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct:

Signature

Date

END OF DOCUMENT

PUBLIC WORKS CONTRACTOR REGISTRATION CERTIFICATION

IMJIN LIFT STATION IMPROVEMENT PROJECT

SUBMIT WITH BID

Pursuant to Labor Code sections 1725.5 and 1771.1, all contractors and subcontractors that wish to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. See <http://www.dir.ca.gov/Public-Works/PublicWorks.html> for additional information.

No bid will be accepted nor any contract entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work.

Bidder hereby certifies that it is aware of the registration requirements set forth in Labor Code sections 1725.5 and 1771.1 and the bidder and all bidder's subcontractors are currently registered as a contractor with the Department of Industrial Relations.

Name of Bidder: _____

DIR Registration Number: _____

Name of Subcontractor: _____

DIR Registration Number: _____

Name of Subcontractor: _____

DIR Registration Number: _____

Name of Subcontractor: _____

DIR Registration Number: _____

Name of Subcontractor: _____

DIR Registration Number: _____

Name of Subcontractor: _____

DIR Registration Number: _____

Name of Subcontractor: _____

DIR Registration Number: _____

Bidder further acknowledges:

1. Bidder shall maintain a current DIR registration for the duration of the project.
2. Bidder shall include the requirements of Labor Code sections 1725.5 and 1771.1 in its contract with subcontractors and ensure that all subcontractors are registered at the time of bid opening and maintain registration status for the duration of the project.
3. Failure to submit this form or comply with any of the above requirements may result in a finding that the bid is non-responsive.

Bidder's Signature: _____

Bidder's Name and Title: _____

Firm: _____

Date: _____

END OF DOCUMENT

PREVAILING WAGE STATEMENT

IMJIN LIFT STATION IMPROVEMENT PROJECT

SUBMIT WITH BID

If awarded the contract, we and our subcontractors shall pay all the workers we assign to the project not less than the prevailing wage as determined by the state of California, Director of industrial Relations in compliance with Section IV, paragraph W of this Invitation to Bid. We are aware that the contractor shall be penalized for non-compliance by either the contractor or his subcontractor(s).

In addition, we are informed of the following:

Copies of the prevailing wage rates are on file at:

Marina Coast Water District
11 Reservation Road
Marina, CA 93933

or

State of California Department of Industrial Relations
Division of Labor Statistics and Research
455 Golden Gate Avenue, 5th Floor, Room 5184
San Francisco, CA 94104
(415) 703-4281

The successful bidder shall be required to post the prevailing wage determinations at each job site.

Each contractor and subcontractor shall keep accurate payroll records showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per them wages paid to each journeyman, apprentice, worker or other employee employed by him or her in connection the public work.

Certified copies of such payroll records must be furnished to the State or Marina Coast Water District upon request.

By signing below, the bidder certifies that he shall comply with the prevailing wage laws.

Company Name: _____

Contractor's Signature: _____

Date: _____

END OF DOCUMENT

LOCAL HIRING FOR PUBLIC WORKS

IMJIN LIFT STATION IMPROVEMENT PROJECT

SUBMIT WITH BID

This contract is for a Marina Coast Water District public works project. All Contractors and Subcontractors are required to comply with all of the provisions of Ordinance 53 Local Hiring (Chapter 2.10 of the MCWD Code). Failure to comply with the local hiring ordinance may subject the Contractor herein with disqualification from any future Marina Coast Water District public works contracts.

The Bidder hereby certifies that (initial as applicable):

_____ Bidder has read Ordinance 53, Local Hiring for District Public Works, and

_____ Bidder can meet the local hiring requirements of Ordinance 53, or

_____ Bidder has made a good faith effort to meet the requirements of Ordinance 53 as documented on the attached pages, and anticipates a total of _____ percent of the workforce will be residents of the Monterey Bay Area, or

_____ Bidder requires an exception because a suitable pool of persons does not exist locally for the specialized skills listed below. These workers will constitute _____ percent of the workforce.

Specialized Skill	No. of Workers	County of Residence

Company Name: _____

Contractor's Signature: _____

Date: _____

BID BOND

Any singular reference to Bidder, Surety, Owner, or other party shall be considered plural where applicable.

BIDDER (Name and Address):

SURETY (Name and Address of Principal Place of Business):

OWNER (Name and Address):

BID

Bid Due Date: **February 20, 2020**

This Capital Improvement project consists of installation of new pumps, discharge pipes, valves, wet well, valve vault, electrical and control equipment, and various site improvements.

BOND

Bond Number:

Date (Not later than Bid due date):

Penal Sum:

_____ 10% (ten percent) of the Total Bid Value in Words

_____ (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

BIDDER

SURETY

Bidder's Name and Corporate Seal (Seal)

Surety's Name and Corporate Seal (Seal)

By: _____
Signature and Title

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title

Attest: _____
Signature and Title

Note: Above addresses are to be used for giving required notice.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder any difference between the total amount of Bidder's Bid and the total amount of the Bid of the next lowest, responsible Bidder who submitted a responsive Bid as determined by Owner for the work required by the Contract Documents, provided that:
 - 1.1. If there is no such next Bidder, and Owner does not abandon the Project, then Bidder and Surety shall pay to Owner the penal sum set forth on the face of this Bond, and
 - 1.2. In no event shall Bidder's and Surety's obligation hereunder exceed the penal sum set forth on the face of this Bond.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
 - 3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
 - 3.2. All Bids are rejected by Owner, or
 - 3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. *The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.*

END OF DOCUMENT

BID SUBMITTAL CHECKLIST

All information required by the terms of the Bid Documents must be furnished. Important items to be submitted are including, but not limited to, those listed below;

ARTICLE 1 - SUBMIT WITH BID

	Form Number	Form Name
<input type="checkbox"/>	00410	Bid Form
<input type="checkbox"/>	00412	Designation of Subcontractors
<input type="checkbox"/>	00416	Designation of Insurance Agent or Broker
<input type="checkbox"/>	00418	List of Project References
<input type="checkbox"/>	00420	Stop Notice Information
<input type="checkbox"/>	00422	Non-Collusion Statement
<input type="checkbox"/>	00423	Public Works Contractor Registration Certification
<input type="checkbox"/>	00424	Prevailing Wage Statement
<input type="checkbox"/>	00426	Local Hire for Public Works
<input type="checkbox"/>	00430	Bid Bond (Bid Security)
<input type="checkbox"/>	No form included	Certificate of Contractor's License

ARTICLE 2 – SUBMIT PRIOR TO OWNER'S EXECUTION OF CONTRACT (After Notice of Award)

<input type="checkbox"/>	00520	Agreement
<input type="checkbox"/>	00610	Performance Bond
<input type="checkbox"/>	00615	Payment Bond

END OF DOCUMENT

Notice of Award

Dated _____

Project: Imjin Lift Station Improvement Project	Owner: Marina Coast Water District	Owner's Contract No.:
Contract:		Engineer's Project No.:
Bidder:		
Bidder's Address: (send Certified Mail, Return Receipt Requested)		

You are notified that your Bid dated _____ for the above Contract has been considered. You are the Successful Bidder and are awarded a Contract for _____

(Indicate total Work, alternates or sections or Work awarded.)

The Contract Price of your Contract is _____ Dollars (\$_____).

(Insert appropriate data if Unit Prices are used. Change language for Cost-Plus contracts.)

_____ copies of each of the proposed Contract Documents (except Drawings) accompany this Notice of Award.

_____ sets of the Drawings will be delivered separately or otherwise made available to you immediately.

You must comply with the following conditions precedent within [15] days of the date you receive this Notice of Award.

1. Deliver to the Owner [_____] fully executed counterparts of the Contract Documents.
2. Deliver with the executed Contract Documents the Contract security [Bonds] as specified in the Instructions to Bidders (Article 20), [and] General Conditions (Paragraph 5.01) [and Supplementary Conditions (Paragraph SC-5.01).]
3. Other conditions precedent:

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award and declare your Bid security forfeited.

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Contract Documents.

Owner

By: _____
Authorized Signature

Title

END OF DOCUMENT

AGREEMENT

IMJIN LIFT STATION IMPROVEMENT PROJECT

TABLE OF ARTICLES

Article 1 – Work

Article 2 – The Project

Article 3 – Engineer

Article 4 – Contract Times

Article 5 – Contract Price

Article 6 – Payment Procedures

Article 7 – Interest

Article 8 – Contractor’s Representations

Article 9 – Contract Documents

Article 10 – Miscellaneous

**AGREEMENT
BETWEEN MARINA COAST WATER DISTRICT
AND [CONTRACTOR] FOR
IMJIN LIFT STATION IMPROVMENT PROJECT**

CONSTRUCTION CONTRACT (STIPULATED PRICE)

THIS AGREEMENT is by and between Marina Coast Water District (MCWD or Owner)

and _____(Contractor).

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

ARTICLE 1 – WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

This Capital Improvement project consists of installation of new pumps, discharge pipes, valves, wet well, valve vault, electrical and control equipment, and various site improvements.

ARTICLE 2 – THE PROJECT

2.01 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows: **IMJIN LIFT STATION IMPROVEMENT PROJECT**

ARTICLE 3 – ENGINEER

3.01 The Project has been designed by Patrick Sullivan, P.E. – GHD Group, 718 Third Street, Eureka, CA 95501.

ARTICLE 4 – CONTRACT TIMES

4.01 Time of the Essence

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 Days to Achieve Substantial Completion and Final Payment

A. The Work will be substantially completed within 180 calendar days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions within 210 calendar days after the date when the Contract Times commence to run.

4.03 Liquidated Damages

A. Contractor and Owner recognize that time is of the essence of this Agreement and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner \$500 for each day that expires after the time specified in Paragraph 4.02 for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner \$500 for each day that expires after the time specified in Paragraph 4.02 for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 5 – CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Paragraphs 5.01.A below:

A. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

ARTICLE 6 – PAYMENT PROCEDURES

6.01 Submittal and Processing of Payments

A. Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by Construction Management as provided in the General Conditions.

6.02 Progress Payments; Retainage

A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 30th day of each month during performance of the Work as provided in Paragraphs 6.02.A.1 and 6.02.A.2 below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.07.A of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements:

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the General Conditions:

a. 80 percent of Work installed but not accepted (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, Owner, on recommendation of Engineer, may determine that as long as the character and progress of the Work remain satisfactory to them, there will be no additional retainage; and

b. 50 percent of cost of materials and equipment not incorporated in the Work that is on site. (with the balance being retainage).

2. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 95 percent of the Work completed, less such amounts as Engineer shall determine in

accordance with Paragraph 14.02.B.5 of the General Conditions and less 50 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected attached to the certificate of Substantial Completion.

6.03 Final Payment

A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.07 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Construction Management as provided in said Paragraph 14.07.

ARTICLE 7 – INTEREST

7.01 All moneys not paid when due as provided in Article 14 of the General Conditions shall bear interest at the rate of 5 percent per annum.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

8.01 In order to induce Owner to enter into this Agreement Contractor makes the following representations:

A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.

B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in Paragraph 4.02 of the General Conditions and (2) reports and drawings of a Hazardous Environmental Condition, if any, at the Site which has been identified in the Supplementary Conditions as provided in Paragraph 4.06 of the General Conditions.

E. Contractor has obtained and carefully studied (or assumes responsibility for doing so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto.

F. Contractor does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.

G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

H. Contractor has correlated the information known to Contractor, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.

I. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

J. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 Contents

A. The Contract Documents consist of the following:

1. This Agreement
2. Performance Bond (pages 1 to 4, inclusive).
3. Payment Bond (pages 1 to 4, inclusive).
4. General Conditions (EJCDC C-700 Standard General Conditions of the Construction Contract)
5. Supplementary Conditions (Document 00800).
6. Technical Specifications titled “CIP No. OS-0205, Imjin Lift Station Improvements Project”
7. Drawings consisting of 20 sheets numbered 1 through 20, inclusive, with each sheet bearing the general title “Imjin Lift Station Improvements Project”
8. Addenda (Numbers 1 to _, inclusive)
9. BID FORM Exhibits to this Agreement (enumerated as follows):
 - a. Contractor’s Bid
 - b. Documentation submitted by Contractor prior to Notice of Award
10. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
 - a. Notice to Proceed.
 - b. Work Change Directives.
 - c. Change Order(s).
11. The Standard Plans and Specifications of the Marina Coast Water District, dated November 2007, are incorporated by reference.

B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 9.

D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the General Conditions.

ARTICLE 10 – MISCELLANEOUS

10.01 Terms

A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02 Assignment of Contract

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

10.03 Successors and Assigns

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

10.04 Severability

A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 Other Provisions – Not Used

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement in duplicate. One counterpart each has been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or identified by Owner and Contractor or on their behalf.

This Agreement will be effective on _____, 2020 (which is the Effective Date of the Agreement).

OWNER:

CONTRACTOR:

Marina Coast Water District

By: _____

By: _____

Title: _____

Title: _____

[CORPORATE SEAL]

Attest: _____

Attest: _____

Title: _____

Title: _____

Address for giving notices:

Address for giving notices:

License No.: _____
(Where applicable)

END OF DOCUMENT

PERFORMANCE BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):
Place of Business:

SURETY (Name and Address of Principal)

OWNER (Name and Address): Marina Coast Water District, 11 Reservation Road, Marina, CA 93933

CONTRACT

Date:
Amount:
Description (Name and Location):

BOND

Bond Number:
Date (Not earlier than Contract Date):
Amount:
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL
Company:

SURETY

Signature: _____ (Seal)
Name and Title:

Surety's Name and Corporate Seal (Seal)

By: _____
Signature and Title
(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required.)

Attest: _____
Signature and Title

CONTRACTOR AS PRINCIPAL
Company:

SURETY

Signature: _____ (Seal)
Name and Title:

Surety's Name and Corporate Seal (Seal)

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title:

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.
2. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 3.1.
3. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
 - 3.1. Owner has notified Contractor and Surety, at the addresses described in Paragraph 10 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and
 - 3.2. Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 3.1; and
 - 3.3. Owner has agreed to pay the Balance of the Contract Price to:
 1. Surety in accordance with the terms of the Contract;
 2. Another contractor selected pursuant to Paragraph 4.3 to perform the Contract.
4. When Owner has satisfied the conditions of Paragraph 3, Surety shall promptly and at Surety's expense take one of the following actions:
 - 4.1. Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
 - 4.2. Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
 - 4.3. Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and Contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
 - 4.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:
 1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefore to Owner; or
 2. Deny liability in whole or in part and notify Owner citing reasons therefore.

5. If Surety does not proceed as provided in Paragraph 4 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 4.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.

6. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 4.1, 4.2, or 4.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To a limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

- 6.1. The responsibilities of Contractor for correction of defective Work and completion of the Contract;
- 6.2. Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions or failure to act of Surety under Paragraph 4; and
- 6.3. Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.

7. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Owner or its heirs, executors, administrators, or successors.

8. Surety hereby waives notice of any change, including changes of time, to Contract or to related subcontracts, purchase orders, and other obligations.

9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located and shall be instituted within two years after Contractor Default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

10. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.

11. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12. Definitions.

- 12.1 Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.

- 12.2. Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.
- 12.3. Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.
- 12.4. Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or comply with the other terms thereof.

END OF DOCUMENT

PAYMENT BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

SURETY (Name and Address of Principal
Place of Business):

OWNER: Marina Coast Water District, 11 Reservation Road, Marina, CA 93933

CONTRACT

Date:
Amount:
Description (Name and Location):

BOND

Bond Number:
Date (Not earlier than Contract Date):
Amount:
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Payment Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

Company:

Signature: _____ (Seal)
Name and Title:

(Space is provided below for signatures of additional parties, if required.)

CONTRACTOR AS PRINCIPAL

Company:

Signature: _____ (Seal)
Name and Title:

SURETY

Surety's Name and Corporate Seal (Seal)

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title

SURETY

Surety's Name and Corporate Seal (Seal)

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title:

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.
2. With respect to Owner, this obligation shall be null and void if Contractor:
 - 2.1. Promptly makes payment, directly or indirectly, for all sums due Claimants, and
 - 2.2. Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.
3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.
4. Surety shall have no obligation to Claimants under this Bond until:
 - 4.1. Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the addresses described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
 - 4.2. Claimants who do not have a direct contract with Contractor:
 1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
 2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
 3. Not having been paid within the above 30 days, have sent a written notice to Surety and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.
5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.
6. When a Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at Surety's expense take the following actions:
 - 6.1. Send an answer to that Claimant, with a copy to Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
 - 6.2. Pay or arrange for payment of any undisputed amounts.
7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.

8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.

9. *Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.*

10. Surety hereby waives notice of any change, including changes of time, to the Contract or to related Subcontracts, purchase orders and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. DEFINITIONS

15.1.Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor's Subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

15.2.Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3.Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or comply with the other terms thereof.

**FOR INFORMATION ONLY – Name, Address and Telephone
Surety Agency or Broker:**

PRECEDENCE

In event of conflict between various provisions of the plans and specifications, the provisions more restrictive of the Contractor shall apply. In event of conflict that cannot be resolved by restrictiveness, the document highest in precedence shall control. The precedence shall be:

1. Federal and State requirements (where applicable)
2. Permits from Agencies having jurisdiction
3. Agreement
4. Bidding Documents
5. Special Requirements
6. Basic Specifications
7. Plans (Drawings)
8. Standard Drawings
9. Reference Specifications

END OF DOCUMENT

Notice to Proceed

Dated _____

Project: Imjin Lift Station Improvement Project	Owner: Marina Coast Water District	Owner's Contract No.:
Contract:		Engineer's Project No.:
Contractor:		
Contractor's Address: [send Certified Mail, Return Receipt Requested]		

You are notified that the Contract Times under the above contract will commence to run on _____. On or before that date, you are to start performing your obligations under the Contract Documents. In accordance with Article 4 of the Agreement, the date of Substantial Completion is _____, and the date of readiness for final payment is _____ [(or) the number of days to achieve Substantial Completion is _____, and the number of days to achieve readiness for final payment is _____].

Before you may start any Work at the Site, Paragraph 2.01.B of the General Conditions provides that you and Owner must each deliver to the other (with copies to Engineer and other identified additional insureds) certificates of insurance which each is required to purchase and maintain in accordance with the Contract Documents.

Also, before you may start any Work at the Site, you must [add other requirements]:

_____	Owner
_____	Given by:
_____	Authorized Signature
_____	Title
_____	Date

Copy to Engineer

END OF DOCUMENT

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the Controlling Law.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly By



PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
a practice division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

AMERICAN COUNCIL OF ENGINEERING COMPANIES

AMERICAN SOCIETY OF CIVIL ENGINEERS

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The Associated General Contractors of America



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These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor Nos. C-520 or C-525 (2002 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the EJCDC Construction Documents, General and Instructions (No. C-001) (2002 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (No. C-800) (2002 Edition).

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GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*--Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*--The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

3. *Application for Payment*--The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*--Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*--The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidder*--The individual or entity who submits a Bid directly to Owner.

7. *Bidding Documents*--The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. *Bidding Requirements*--The Advertisement or Invitation to Bid, Instructions to Bidders, bid security of acceptable form, if any, and the Bid Form with any supplements.

9. *Change Order*--A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

10. *Claim*--A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*--The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*-- Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor's submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

13. *Contract Price*--The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*--The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any, (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.

15. *Contractor*--The individual or entity with whom Owner has entered into the Agreement.

16. *Cost of the Work*--See Paragraph 11.01.A for definition.

17. *Drawings*--That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

18. *Effective Date of the Agreement*--The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *Engineer*--The individual or entity named as such in the Agreement.

20. *Field Order*--A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

21. *General Requirements*--Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

22. *Hazardous Environmental Condition*--The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

23. *Hazardous Waste*--The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

24. *Laws and Regulations; Laws or Regulations*--Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

25. *Liens*--Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

26. *Milestone*--A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*--The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.

28. *Notice to Proceed*--A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

29. *Owner*--The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

30. *PCBs*--Polychlorinated biphenyls.

31. *Petroleum*--Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

32. *Progress Schedule*--A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

33. *Project*--The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

34. *Project Manual*--The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

35. *Radioactive Material*--Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

36. *Related Entity* -- An officer, director, partner, employee, agent, consultant, or subcontractor.

37. *Resident Project Representative*--The authorized representative of Engineer who may be assigned to the Site or any part thereof.

38. *Samples*--Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

39. *Schedule of Submittals*--A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

40. *Schedule of Values*--A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

41. *Shop Drawings*--All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

42. *Site*--Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

43. *Specifications*--That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain

administrative requirements and procedural matters applicable thereto.

44. *Subcontractor*--An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

45. *Substantial Completion*--The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

46. *Successful Bidder*--The Bidder submitting a responsive Bid to whom Owner makes an award.

47. *Supplementary Conditions*--That part of the Contract Documents which amends or supplements these General Conditions.

48. *Supplier*--A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or any Subcontractor.

49. *Underground Facilities*--All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

50. *Unit Price Work*--Work to be paid for on the basis of unit prices.

51. *Work*--The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

52. *Work Change Directive*--A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times

but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 Terminology

A. The following words or terms are not defined but, when used in the Bidding Requirements or Contract Documents, have the following meaning.

B. Intent of Certain Terms or Adjectives

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action or determination will be solely to evaluate, in general, the Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. Day

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. Defective

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

- a. does not conform to the Contract Documents, or
- b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents, or
- c. has been damaged prior to Engineer's - recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. Furnish, Install, Perform, Provide

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 - PRELIMINARY MATTERS

2.01 Delivery of Bonds and Evidence of Insurance

A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 Copies of Documents

A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 Commencement of Contract Times; Notice to Proceed

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement

or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 Starting the Work

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 Before Starting Construction

A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule; indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 Preconstruction Conference

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.07 Initial Acceptance of Schedules

A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to Owner.

C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or

responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, or Engineer, or any of, their Related Entities, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. Reporting Discrepancies

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor may discover and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor knew or reasonably should have known thereof.

B. Resolving Discrepancies

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

a. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work

(unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;
2. Engineer's approval of a Shop Drawing or Sample; (Subject to the provisions of Paragraph 6.17.D.3); or
3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier or other individual or entity performing or furnishing all of the Work under a direct or indirect contract with Contractor, shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or Engineer's consultants, including electronic media editions; or
2. reuse any of such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaption by Engineer.

B. The prohibition of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

A. Copies of data furnished by Owner or Engineer to Contractor or Contractor to Owner or Engineer that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's

sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party..

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Contract Documents; and

2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Contract Documents.

B. *Limited Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice*: If Contractor believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. Possible Price and Times Adjustments

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

c. Contractor failed to give the written notice as required by Paragraph 4.03.A.

3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, Owner and Engineer, and any of their Related Entities shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

a. reviewing and checking all such information and data,

b. locating all Underground Facilities shown or indicated in the Contract Documents,

c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction, and

d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will

promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the Engineer in the preparation of the Contract Documents.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any.

E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered to Contractor written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to

entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06. G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 - BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified

in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent must be accompanied by a certified copy of the agent's authority to act.

C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

A. Contractor shall deliver to Owner, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

B. Owner shall deliver to Contractor, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

5.04 *Contractor's Liability Insurance*

A. Contractor shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection

from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

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

b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insured (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include completed operations insurance;

4. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

6. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and

7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment.

a. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, (other than caused by flood) and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.

B. Owner shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.

D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any

deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insured or additional insured (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order .

B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract

Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances. The superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or

received from the superintendent shall be binding on Contractor.

6.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. "*Or-Equal*" Items: If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole,

3) it has a proven record of performance and availability of responsive service; and

b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times, and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. Substitute Items

a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented in the General Requirements and as Engineer may decide is appropriate under the circumstances.

d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

1) shall certify that the proposed substitute item will:

a) perform adequately the functions and achieve the results called for by the general design,

b) be similar in substance to that specified, and

c) be suited to the same use as that specified;

2) will state:

a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time;

b) whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and

c) whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

3) will identify:

a) all variations of the proposed substitute item from that specified, and

b) available engineering, sales, maintenance, repair, and replacement services;

4) and shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change,

B. Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. Engineer's Evaluation: Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

D. Special Guarantee: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

E. Engineer's Cost Reimbursement: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute item so proposed or submitted by Contractor, Contractor shall reimburse Owner for the charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the charges of Engineer for making changes in the Contract

Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

F. Contractor's Expense: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 Concerning Subcontractors, Suppliers, and Others

A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity, nor

2. shall anything in the Contract Documents create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual

or entity except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of Owner or Engineer its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 Taxes

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 Use of Site and Other Areas

A. Limitation on Use of Site and Other Areas

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

B. Removal of Debris During Performance of the Work: During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. Cleaning: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. Loading Structures: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 Record Documents

A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 Safety and Protection

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Draw-

ings or Specifications or to the acts or omissions of Owner or Engineer or , or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

D. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the acceptable Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. Shop Drawings

a. Submit number of copies specified in the General Requirements.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples*: Contractor shall also submit Samples to Engineer for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals.

a. Submit number of Samples specified in the Specifications.

b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals , any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. Submittal Procedures

1. Before submitting each Shop Drawing or Sample, Contractor shall have determined and verified:

a. all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

b. the suitability of all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;

c. all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto; and

d. shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents

with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations, that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawing's or Sample Submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. Engineer's Review

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. Resubmittal Procedures

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 Continuing the Work

A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or

disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 Contractor's General Warranty and Guarantee

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its Related Entities shall be entitled to rely on representation of Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or

7. any correction of defective Work by Owner.

6.20 Indemnification

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or

arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .

B. In any and all claims against Owner or Engineer or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal

shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 - OTHER WORK AT THE SITE

7.01 *Related Work at Site*

A. Owner may perform other work related to the Project at the Site with Owner's employees, or via other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and
2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and shall properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and

properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.

B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's actions or inactions.

C. Contractor shall be liable to Owner and any other contractor for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's action or inactions.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

A. Owner's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by Engineer in preparing the Contract Documents.

8.06 *Insurance*

A. Owner's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility in respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. If and to the extent Owner has agreed to furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents, Owner's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents and will not be changed without written consent of Owner and Engineer.

9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep

Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.

D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question

B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believe that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.

C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show

partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to, the Resident Project Representative, if any, and assistants, if any.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall

promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.B.

10.03 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any bond to be given to a surety, the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

B. *Notice:* Written notice stating the general nature of each Claim, shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part,

2. approve the Claim, or

3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.

F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 - COST OF THE WORK;
ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in Paragraph 11.01.B.

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and

Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to Engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have

resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expresses, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. Costs Excluded: The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A and 11.01.B.

C. Contractor's Fee: When all the Work is performed on the basis of cost-plus, Contractor's fee shall

be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. Documentation: Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 Allowances

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. Cash Allowances

1. Contractor agrees that:

a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. Contingency Allowance

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 Unit Price Work

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

2. there is no corresponding adjustment with respect any other item of Work; and

3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an

allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraph 12.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted

by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

D. Owner, Engineer and the Related Entities of each of them shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of Engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. All defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's Site safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in said Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to

be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, it must, if requested by Engineer, be uncovered for observation.

F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

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

B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.

D. If, the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

A. Promptly after receipt of notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or
2. correct such defective Work; or
3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications .

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress

payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. Applications for Payments

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations on the Site of the executed Work as an experienced and qualified design professional and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and to any other qualifications stated in the recommendation); and

c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or

b. that there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

a. to supervise, direct, or control the Work, or

b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or

e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent

inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

- a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
- b. the Contract Price has been reduced by Change Orders;
- c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
- d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. Reduction in Payment

1. Owner may refuse to make payment of the full amount recommended by Engineer because:

- a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
- b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
- c. there are other items entitling Owner to a set-off against the amount recommended; or
- d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor corrects to Owner's satisfaction the reasons for such action.

3. If it is subsequently determined that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1.

14.03 Contractor's Warranty of Title

A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 Substantial Completion

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

B. Promptly after Contractor's notification, , Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will within 14 days after submission of the tentative certificate to Owner notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will within said 14 days execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial

Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to complete or correct items on the tentative list.

14.05 *Partial Utilization*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions.

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor will certify to Owner and Engineer that such part of the Work is substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals

that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. Application for Payment

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.7;

b. consent of the surety, if any, to final payment;

c. a list of all Claims against Owner that Contractor believes are unsettled; and

d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner or Owner's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Engineer's Review of Application and Acceptance*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations

under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and , will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance

with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;

3. Contractor's disregard of the authority of Engineer; or

4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion),

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and

3. complete the Work as Owner may deem expedient.

C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph Owner shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B, and 15.02.C.

15.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 - DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be

governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions, or

2. agrees with the other party to submit the Claim to another dispute resolution process, or

3. gives written notice to the other party of their intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 - MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

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SUPPLEMENTARY CONDITIONS

I. General

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (No. C-700, 2002 Edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

II. Specific Items

SC-1.01.A.29 Add the following sentence at the end of Paragraph 1.01.A.29: The terms "Owner," "District" and "MCWD" shall be used interchangeably and shall all have the same meaning.

SC 2.02 Delete Paragraph 2.02.A in its entirety and insert the following in its place:

A. Owner shall furnish to Contractor up to 5 printed or hard copies of the Drawings and Project Manual and one set in electronic format. Additional copies will be furnished upon request at the cost of reproduction.

SC-4.02 Delete Paragraphs 4.02.A and 4.02.B in their entirety and insert the following:

A. No reports of explorations or tests of subsurface conditions at or contiguous to the Site are known to the Owner or Engineer.

SC-4.06 Delete Paragraphs 4.06.A and 4.06.B in their entirety and insert the following:

A. No reports on drawings related to Hazardous Environmental Conditions are known to Owner or Engineer.

B. Not Used.

SC-5.02 Add the following new paragraphs immediately after Paragraph 5.02.A:

B. All of the insurance shall be provided through companies acceptable to Owner.

C. All insurance shall be provided on policy forms acceptable to the owner (Accord Form 25-S or equivalent), signed by the insurer's representative. Such evidence shall include an original copy of the additional insured endorsement signed by the insurer's representative.

D. Insurance is to be placed with insurers having a current AM Best rating of no less than A- or equivalent, unless otherwise agreed to by the parties in writing.

SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.B:

C. Failure of Owner to demand such certificates or other evidence of full compliance with these insurance requirements or failure of Owner to identify a deficiency from evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

D. By requiring such insurance and insurance limits herein, Owner does not represent that coverage and limits will necessarily be adequate to protect Contractor, and such coverage and limits shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

SC-5.04 Add the following new paragraph immediately after Paragraph 5.04.B:

C. The limits of liability for the insurance required by Paragraph 5.04 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers' Compensation, and related coverages under Paragraphs 5.04.A.1 and A.2 of the General Conditions:

- a. State: Statutory
- b. Applicable Federal (e.g., Longshoreman's): Statutory
- c. Employer's Liability: \$ 1,000,000

Annual Aggregate \$ 1,000,000

2. Contractor's General Liability under Paragraphs 5.04.A.3 through A.6 of the General Conditions which shall include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody and control of Contractor:

- a. General Aggregate \$ 2,000,000
- b. Products - Completed Operations Aggregate \$ 1,000,000
- c. Personal and Advertising Injury \$ 1,000,000
- d. Each Occurrence (Bodily Injury and Property Damage) \$ 1,000,000

e. Property Damage liability insurance will provide Explosion, Collapse, and Under-ground coverages where applicable.

- f. Excess or Umbrella Liability
 - 1) General Aggregate \$ 1,000,000
 - 2) Each Occurrence \$ 1,000,000

3. Automobile Liability under Paragraph 5.04.A.6 of the General Conditions:

- a. Bodily Injury:
 - Each Person \$ 1,000,000
 - Each Accident \$ 1,000,000
- b. Property Damage:
 - Each Accident \$ 1,000,000
- c. Combined Single Limit of \$ 1,000,000

4. The Contractual Liability coverage required by Paragraph 5.04.B.4 of the General Conditions shall provide coverage for not less than the following amounts:

- a. Bodily Injury:
 - Each Accident \$ 1,000,000
 - Annual Aggregate \$ 1,000,000
- b. Property Damage:
 - Each Accident \$ 1,000,000

5. In addition to the individuals and entities specified, include as additional insureds, the following:

- a. Owner's inspector (TBD)
- b. County of Monterey, CA

SC-5.06.A. Delete Paragraph 5.06.A in its entirety and insert the following in its place:

A. Contractor shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof.

1. This insurance shall:

a. include the interests of Owner, Contractor, Subcontractors, Engineer and any other individuals or entities identified herein, and the officers, directors, partners, employees, agents and other consultants and subcontractors of any of them each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

b. in addition to the individuals and entities specified, include as additional insureds, the following:

- 1) County of Monterey, CA

c. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss and damage to the Work, temporary buildings, falsework, and materials and equipment in transit and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;

d. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

e. cover materials and equipment stored at the Site or at another location that was agreed to

in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

f. allow for partial utilization of the Work by Owner;

g. include testing and startup; and

h. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor and Engineer with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.

2. Contractor shall be responsible for any deductible or self-insured retention.

3. The policies of insurance required to be purchased and maintained by Contractor in accordance with this Paragraph SC-5.06.A shall comply with the requirements of paragraph 5.06.C of the General Conditions.

SC-5.06.B. Delete Paragraph 5.06.B in its entirety and insert the following in its place:

B. Owner maintains property insurance upon the existing District Property at the Site. This insurance protects the interests of the Owner and its officers, directors, partners, employees, agents and authorized volunteers. Contractor is not a named additional insured and said policy is not subject to the requirements of GC-5.06.C.

SC-5.06.E. Delete Paragraph 5.06.E in its entirety.

SC-5.08 Delete paragraphs 5.08.A and 5.08.B and insert the following in their place:

A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Contractor and Owner. Owner, Contractor and other parties of interest shall agree in writing as to the distribution of payments, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.

B. If the Owner, Contractor and other parties of interest cannot reach an agreement within 30-days from the time of commencing negotiations, the settlement shall be handled as a Claim per the Dispute Resolution procedures in SC-16.01.

SC-6.06 Add a new paragraph immediately after Paragraph 6.06.G:

H. Owner or Engineer may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by a particular Subcontractor or Supplier.

SC-6.08 Add the following new paragraph immediately after Paragraph 6.08.A:

B The Owner shall provide the following permits:

1. CEQA Categorical Exemption

SC-6.09 Add the following new paragraphs immediately after Paragraph 6.09.D:

6.09.E. Public Contract Provisions

1. The Contractor is responsible for his own compliance, and is responsible for all Subcontractors' compliance, with all applicable sections of the California Labor Code regarding the payment of wages, the employment of apprentices, and hours of work, all as set forth in Section 1170 through Section 1815 of that Code. Those requirements are set forth below.

2. Payment of Prevailing Wages

a. Pursuant to Sections 1774 and 1775 of the Labor Code, unless the contract price is under \$1,000.00, the Contractor and any subcontractor under him, shall pay not less than the general prevailing rate of per diem wages, including holiday and overtime pay, to all workmen employed in the execution of this Contract. Failure to so comply will result in a fine of \$25.00 per day per violation, and the obligation to compensate each such employee the difference between the wage actually paid and the prevailing wage applicable to that employee's craft.

b. Pursuant to Section 1773.2 of the California Labor Code, the District has on file at its

principal office, copies of the prevailing rate of per diem wages for each craft, and classification or type of workman needed to execute the contract, and a copy shall be available to any interested party upon request.

c. The Contractor shall obtain and post copies of the prevailing per diem wage rates at the job site during the term of this project.

d. Pursuant to Labor Code Section 1776, the Contractor and each subcontractor shall keep an accurate payroll record, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by the Contractor or subcontractor in connection with the project, and such other information as required by law, and such payroll records shall be certified and made available for inspection and release all in accordance with Labor Code Section 1776 and 8 California Code of Regulations Section 16000 et seq. **All contractors and subcontractors must furnish electronic certified payroll records directly to the Labor Commissioner (aka Division of Labor Standards Enforcement).** The Contractor shall file with the District certified copies of its and all its subcontractors' payroll records within thirty (30) calendar days after completion of each payroll period at no cost to the District.

e. Pursuant to Section 1773.8 of the Labor Code, travel and subsistence payments shall also be paid to each workman needed to execute such work if such travel and subsistence payments are set forth in the applicable collective bargaining agreements and filed with the Department of Industrial Relations thirty (30) days prior to the call for bids.

f. Unless the Contract amount is under \$30,000 or will be completed in less than twenty (20) days (or if this Contract involves a specialty contractor under \$2,000 or less than 5 days) the Contractor shall comply with Section 1777.5 regarding the employment of registered apprentices upon public works by hiring, and by requiring that all subcontractors hire apprentices at the wage rate and ratio required, if at all, and by requiring the contribution of funds to appreciable crafts or trades as applicable under Section 1777.5.

g. The Contractor shall, as a penalty to the District, forfeit not more than two hundred

dollars (\$200.00) for each calendar day, or portion thereof, for each worker paid less than the prevailing rates as determined by the Director of the Department of Industrial Relations for such work or craft in which such worker is employed for any public work done under this contract by the Contractor or by any subcontractor under the Contractor. The difference between such prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing wage rate shall be paid to each worker by the Contractor. Labor Code Section 1775.

h. Required California Department of Industrial Relations provisions:

- No contractor or subcontractor may be listed on a bid proposal for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].
- No contractor or subcontractor may be awarded a contract for public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.
- This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

i. The Contractor certifies that the Contractor and all subcontractors for this public works project have been registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

j. The District shall not recognize any claim for additional compensation from the Contractor because of the payment by the Contractor of any wage rate in excess of the prevailing rate of per diem wages. The possibility of wage increases is one of the elements to be considered by the Contractor in determining its bid and will not, under any circumstances, be considered as the basis of a claim against the District under this contract.

3. Hours of Labor

a. Pursuant to Sections 1810 through 1815 of the Labor Code, eight hours of labor constitutes a legal day's work, and work performed by employees of the Contractor or any subcontractor in excess of eight hours per day, and forty hours in any one week, shall be compensated at not less than one and one-half times their basic rate of pay. Violation of this condition shall result in a penalty of \$25.00 per day per workman so underpaid.

4. Unidentified Utilities – Costs (Government Code 4215)

a. The District shall be responsible for the timely removal, relocation, or protection of existing main or trunk line utility facilities located on the construction site, if such utilities are not identified in the plans and specifications for the work. The Contractor shall be compensated for his actual costs of locating, repairing damage not due to his failure to exercise reasonable care, and removing or relocating such utility facilities not indicated in the plans and specifications with reasonable accuracy and for equipment on the project necessarily idled during such work. If the Contractor discovers utility facilities not identified in the contract plans or specifications, he shall immediately notify the District and the utility in writing. The Contractor shall not be assessed liquidated damages for delay if caused by the failure of the District or the owner of the utility to provide for removal or relocation of such utility facilities. The District shall provide a layout of all main lines and existing service laterals. The Contractor shall exercise due care in verifying the locations provided by the District and shall notify the District of site conditions that differ from those indicated.

5. Dispute Resolution Procedures for Claims of Less Than \$375,000

a. Sections 20104 - 20104.6 of the Public Contract Code set forth required procedures for the parties to resolve claim disputes involving less than \$375,000, including the presentation of written claims with substantiating documents on or before the date of final payment, requests for additional documentation, time limits for responding to written claims, and requiring a conference to meet and confer; and also relating to filing a claim before suit, and required arbitration provisions in the event of a civil action filed to resolve the claim. All of such procedures, time limits and requirements shall be

complied with if such Code sections are applicable to disputed claim.

6. Assignment of Antitrust/Unfair Business Practice Claims

a. Pursuant to Public Contract Code Section 7103, Contractor and any subcontractors supplying goods, services or materials under this contract agree to assign District all rights, title and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C Sec. 15) or under the Cartwright Act (Chapter 2 commencing with Section 16700 of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services or materials pursuant to this contract or the subcontract.

7. Substitution of Securities for Retention. Pursuant to Public Contract Code Section 22300 and upon Contractor's request, the District will make payments into escrow of funds which would otherwise be retained from progress payments under the payments to contractor provisions in the Agreement and the Supplementary and General Conditions if the Contractor deposits into that escrow securities eligible for investment under Public Contract Code Section 22300 (hereafter collectively referred to as "securities"), upon the following terms and conditions:

a. The escrow agent shall be either the District Treasurer or a state or federal chartered bank acceptable to the District.

b. The Contractor shall bear all expenses of the District and of the escrow agent in connection with the escrow.

c. The fair market value of the securities shall be at least equal to 100 percent of the cash amount withheld as retention under the contract and the amount of the required securities shall be adjusted from time to time based upon changes in the fair market value of the securities on deposit with the escrow agent. Such securities shall be valued by the District Treasurer whose decision on valuation of the securities shall be final.

d. The Contractor shall enter into an escrow agreement substantially similar in form to that prescribed in Public Contract Code Section 22300.

e. The Contractor shall obtain the written consent to the escrow agreement of the surety or sureties furnishing Contractor with its performance and payment bonds.

SC-6.13 Add the following new paragraphs after paragraph 6.13.D:

E. In carrying out his/her work, the Contractor shall at all times, exercise all necessary precautions for the safety of employees appropriate to the nature of the work and the conditions under which the work is to be performed, and be in compliance with all federal, state and local statutory and regulatory requirements including California Department of Industrial Relations (Cal/OSHA) regulations; and the U.S. Department of Transportation Omnibus Transportation Employee Testing Act (as applicable). Safety precautions as applicable shall include, but shall not be limited to, adequate life protection, and life saving equipment; adequate illumination for underground and night operations; instructions in accident prevention for all employees such as machinery guards, safe walkways, scaffolds, ladders, bridges, gang planks; confined space procedures; trenching and shoring; fall protection; and other safety devices, equipment and wearing apparel as are necessary or lawfully required to prevent accidents, injuries, or illnesses; and adequate facilities for the proper inspection and maintenance of all safety measures.

F. The Contractor shall be responsible for the safeguarding of all utilities. At least two working days before beginning work, the Contractor shall call the Underground Service Alert (USA) in order to determine the location of sub-structures. The Contractor shall immediately notify the District and the utility owner if he/she disturbs, disconnects, or damages any utility.

G. In accordance with Section 6705 of the California Labor Code, the Contractor shall submit to the District specific plans to show details of provisions for worker protection from caving ground during excavations of trenches of five feet or more in depth. The excavation/trench safety plan shall be submitted to and accepted by the District prior to starting excavation. The trench safety plan shall have details showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground. If such a plan varies from the shoring system standards established by the Construction Safety Orders of the California Department of Industrial Relations (Cal/OSHA), the plan shall be prepared by a California registered civil or structural engineer. As part of the plan, a note shall be included stating that the registered civil or structural engineer

certifies that the plan complies with the Cal/OSHA Construction Safety Orders, or that the registered civil or structural engineer certifies that the plan is not less effective than the shoring, bracing, sloping or other provisions of the Safety Orders. In no event shall the Contractor use a shoring, sloping, or protective system less effective than that required by said Construction Safety Orders. Submission of this plan in no way relieves the Contractor of the requirement to maintain safety in all areas. If excavations or trench work requiring a Cal/OSHA permit are to be undertaken, the Contractor shall submit his/her permit with the excavation/trench work safety plan to the District before work begins.

H. Trench Excavation: Approval of Plan for Protection from Caving

1. If the contract involves an estimated expenditure of more than \$25,000, for the excavation of any trench or trenches five feet or more in depth, the Contractor shall submit, for acceptance and approval by the District or its designated engineer, in advance of excavation, a detailed plan showing the design of shoring, bracing, sloping, or other provision to be made for worker protection from the hazard of caving ground during such excavation, all in accordance with Labor Code Section 6705.

I. Excavations Deeper than Four Feet Involving Hazardous Wastes or Materially Different Site Conditions

1. If the contract involves digging trenches or other excavations that extend deeper than four feet below the surface:

a. The Contractor shall promptly, and before any of the following conditions are disturbed, notify the District, in writing, of any:

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

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

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

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

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

SC-6.17 Add the following new paragraph immediately after paragraph 6.17.E.1

F *Specified Submittals*

1. Contractor is responsible for making all submittals as specified in the Contract Documents. Where the Contract Documents specifically require the submittal of shop drawings, samples, product information, materials information or other items, failure of the Contractor to make such submittal, and/or failure of the Engineer or Owner to request such submittal, shall not imply approval of the Contractor's proposed item.

SC-6.20 Delete paragraph 6.20.A in its entirety and insert the following in its place:

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work or the failure, neglect

or refusal of the Contractor to perform the Work and all obligations under the Contract, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.

SC-7.01 Add the following new paragraph immediately after paragraph 7.01.C.

D. Related Work at Site None.

SC-9.03 Project Representative: Not Used.

SC-11.03.D Delete Paragraph 11.03.D in its entirety and insert the following in its place:

C. The unit price of an item of Unit Price Work shall be subject to reevaluation and adjustment under the following conditions:

1. if the Bid price of a particular item of Unit Price Work amounts to 10 percent or more of the Contract Price and the variation in the quantity of that particular item of Unit Price Work performed by Contractor differs by more than 10 percent from the estimated quantity of such item indicated in the Agreement; and

2. if there is no corresponding adjustment with respect to any other item of Work; and

3. if Contractor believes that Contractor has incurred additional expense as a result thereof or if Owner believes that the quantity variation entitles Owner to an adjustment in the unit price, either Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Article 10 if the parties are unable to agree as to the effect of any such variations in the quantity of Unit Price Work performed.

SC-16 Dispute Resolution

SC-16.01 Delete Paragraph 16.01.A in its entirety and insert the following in its place:

A. Either Owner or Contractor may request mediation of any Claim submitted to the Engineer for a decision under Paragraph 10.05 before such a decision becomes final and binding. The mediation will be governed by the Construction industry mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement, except that the American Arbitration Association shall not administer the mediation. The mediation shall be initiated by one party sending a written demand of mediation to the other party. The parties shall agree on an arbitrator and if they are unable to so agree, the then-presiding judge of Monterey County, California Superior Court shall appoint an arbitrator.

SC-16.01 Delete Paragraph 16.01.C in its entirety and insert the following in its place:

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to demand arbitration of the Claim, pursuant to Paragraph SC-16.02, or
2. agrees with the other party to submit the Claim to another dispute resolution process.

SC-16.02 Add the following new paragraph immediately after Paragraph 16.01.

SC-16.02 Arbitration

A. All Claims or counterclaims, disputes, or other matters in question between Owner and Contractor arising out of or relating to the Contract Documents or the breach thereof (except for Claims which have been waived by the making or acceptance of final payment as provided by Paragraph 14.09) including but not limited to those not resolved under the provisions of Paragraphs SC-16.01A and 16.01.B will be decided before a single neutral arbitrator in accordance with the Commercial Arbitration Rules of the American Arbitration Association, except that the American Arbitration Association shall not administer the arbitration. The parties shall agree on an arbitrator and if they are unable to so agree, the then-presiding judge of

Monterey County, California Superior Court shall appoint an arbitrator. The arbitration shall be subject to the conditions and limitations of this Paragraph SC-16.02. This agreement to arbitrate and any other agreement or consent to arbitrate entered into will be specifically enforceable under the prevailing law of any court having jurisdiction.

B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitrator or arbitration provider, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the 30 day period specified in Paragraph SC-16.01.C, and in all other cases within a reasonable time after the Claim or counterclaim, dispute, or other matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such Claim or other dispute or matter in question would be barred by the applicable statute of limitations.

C. No arbitration arising out of or relating to the Contract Documents shall include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:

1. the inclusion of such other individual or entity is necessary if complete relief is to be afforded among those who are already parties to the arbitration; and
2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration and which will arise in such proceedings.

D. The award rendered by the arbitrator(s) shall be consistent with the agreement of the parties, in writing, and include: (i) a concise breakdown of the award; (ii) a written explanation of the award specifically citing the Contract Document provisions deemed applicable and relied on in making the award.

E. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Controlling Law relating to vacating or modifying an arbitral award.

F. The fees and expenses of the arbitrators and any arbitration service shall be shared equally by Owner and Contractor.

SC-17.05 Delete paragraph 17.05.A in its entirety and replace it with the following:

A. This Contract shall be construed and enforced according to the laws of the State of California, and the parties hereby agree that the County of Monterey shall be the proper venue for any dispute arising hereunder.



MARINA COAST WATER DISTRICT

**CIP OS-0205
IMJIN LIFT STATION IMPROVEMENTS
PROJECT**

TECHNICAL SPECIFICATIONS

November 2019

REVISED DECEMBER 2019



MARINA COAST WATER DISTRICT
IMJIN LIFT STATION IMPROVEMENTS PROJECT

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SECTION 01110

SUMMARY OF WORK

PART 1 – GENERAL

The Contract Documents describe the Work to be performed under this Contract which includes, but is not limited to, furnishing all tools, equipment, materials, supplies, and manufactured articles for the Project. It shall also include the furnishing of all transportation and services, including fuel, power, water, and essential communications, necessary and for the performance of all labor, work, or other operations required for the performance of the Contract in accordance with the Contract Documents.

1.01 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work comprises installation of new pumps, discharge pipes, valves, wet well, valve vault, electrical and control equipment, and various site improvements at the Imjin Lift Station site. The Work shall include, but not be limited to, permits, mobilization, temporary utilities, protection of existing improvements, safety, project management, quality control, coordination, surveying, traffic control, demolition, abandonment, site preparation, sewer flow control in existing lift stations affected by the Work, earthwork, open trench construction, temporary shoring and bracing, dewatering, sanitary sewers, testing, cleanup, and demobilization.
- B. All risk of loss, damage or diminution to the Work shall rest with Contractor until final acceptance of the Work by the District.

1.02 JOB CONDITIONS

- A. Portions of the Work could include exposure to untreated sewage (wastewater). The Contractor shall be responsible for providing experienced and qualified personnel to anticipate and meet the safety and health requirements of this project. Untreated sewage (wastewater) may potentially contain disease-producing organisms, such as Hepatitis-B, coliform bacteria, and the HIV virus. The Contractor shall require its personnel to observe proper hygienic precautions. Solvents, gasoline, methane, hydrogen sulfide, and other hazardous materials may accompany untreated sewage and, therefore, could be hazardous to open flame, sparks, or unventilated occupancy. The Contractor shall take measures to assure his personnel observe proper safety precautions when working in these areas.

1.03 BEGINNING AND COMPLETION OF THE WORK

- A. In accordance with the provisions of the Contract Documents, the Contractor shall begin the Work on the date specified in the written Notice to Proceed from the District, and shall complete all of the Work included in the Contract within the time specified in said Notice. Time stated for completion shall include final cleanup of the premises.

1.04 CONTRACT METHOD

- A. The Work of this Contract is a combination unit price and lump sum contract. The basis for measurement and payment shall be as indicated in Section 01270.
- B. The Contractor shall include the requirements of the General Conditions and Supplementary General Conditions of the Contract as a part of all of its subcontract agreements.

1.05 ORDER OF THE WORK

- A. Contractor's order and time to complete shall conform to the requirements of the approved Contractor's schedule as submitted under the provisions for "Contractor's Schedules" in Section 01330, "Contractor Submittals".

1.06 WORK BY OTHERS

- A. General: The Contractor's attention is directed to the fact that work may be conducted at the site by other contractors during the performance of the Work under this contract. The Contractor shall conduct its operations so as to cause a minimum of interference with the Work of such other contractors, and shall cooperate fully with such contractors to provide continued safe access to their respective portions of the site, as required to perform their respective contracts.
- B. Interference With Work on Utilities: The Contractor shall cooperate fully with all utility forces of the District or forces of other public or private agencies engaged in the relocation, altering, or otherwise rearranging of any facilities which interfere with the progress of the Work, and shall schedule the Work so as to minimize interference with said relocation, altering, or other rearranging of facilities.
- C. Concurrent Work by Other Contractors: The Contractor's attention is directed to the possibility that work may be conducted at or adjacent to the site by other contractors during the performance of the Work of this Contract. The Contractor shall conduct its operations so as to cause a minimum of interference with the work of such other contractors.

1.07 WORK SEQUENCE/NOTIFICATIONS

- A. The Contractor's attention is directed to the fact that no sustained interruption in the flows of existing lift stations can be accommodated by the Marina Coast Water District.
- B. No sustained interruption in access to any adjacent businesses can be accommodated. Prior to beginning work in the vicinity of any businesses, the Contractor shall contact the businesses, provide the business owners written preliminary notification of the intended schedule, and if necessary, determine and prepare an alternate schedule for the Engineer's approval that provides minimal disruption.
- C. Prior to beginning work, the Contractor will notify residents and or businesses 72 hours in advance of all operations requiring vehicles to be removed from the street work areas and will post District furnished temporary "NO PARKING" signs (maximum 100 feet apart) on each side of the street 72 hours prior to the scheduled work day for each work area. The Contractor's posting will provide for work on the day scheduled and the following work day. No parking signs shall include the following information: Time, day, date, purpose and the following statement: "Violators will be towed at owner's expense. CVC 22651". If the work is not performed during this period, the street work will have to be rescheduled with 5 working days advance notice. The Contractor shall leave the streets open to traffic until just prior to starting the work, and will provide all barricades, signs and traffic control necessary to protect the work. The Contractor will perform all re-posting of no parking signs and re-notification occasioned by his failure to meet the posted schedule. All streets shall be open to traffic between the hours of 5:00 p.m. and 8:00 a.m.

1.08 CONTRACTOR USE OF PROJECT SITE

- A. The Contractor's use of the project site shall be limited to its construction operations, including on-site storage of materials, on-site fabrication facilities, and field offices.

1.09 DISTRICT USE OF THE PROJECT SITE

- A. When the Contractor's work involves rehabilitation of or extension to the existing facilities, the District may utilize all or part of the existing facilities during the entire period of the construction for the conduct of the District's normal operations. The Contractor shall cooperate with the Engineer to minimize interference with the Contractor's operations and to facilitate the District's operations. In any event, the District and the Engineer and their

authorized representatives shall be allowed access to the project site at all times during the period of construction.

1.10 PARTIAL UTILIZATION OF THE WORK BY THE DISTRICT

- A. The District may take partial utilization of the Work upon completion of the various stages.
- B. The Contractor is hereby advised that the District will accept the responsibility for the maintenance and protection of the specific portion of the project so used. The Contractor shall retain full responsibility for satisfactory operation of the total project, however.

1.11 PROJECT MEETINGS

- A. Preconstruction Conference: Prior to the commencement of Work at the site, a Preconstruction conference will be held at a mutually agreed time and place which shall be attended by the Contractor, its Superintendent, and its subcontractors as appropriate. Other attendees will be:
 - 1. Engineer and the Resident Project Representative.
 - 2. Representatives of the District.
 - 3. Others as requested by Contractor, or Engineer.
- B. Unless previously submitted to the Engineer, the Contractor shall bring to the conference three copies of each of the following:
 - 1. Draft Construction Schedule.
 - 2. Procurement schedule of major equipment and materials and items requiring long lead time.
 - 3. Shop Drawing/Sample/submittal schedule.
 - 4. Schedule of values (unit price and lump sum price breakdown) for progress payment purposes.
 - 5. Substitution Requests per Section 01330.
 - 6. Letter of Responsibility designating emergency contacts for the Contractor after business hours (3 copies).
- C. At the Preconstruction conference the District will provide the Contractor with six sets of the Contract Documents. The District will release the original

Contract Documents to a printing service approved by the District for reproduction of additional sets of Contract Documents required by the Contractor. It shall be the Contractor's responsibility to arrange for pick up and return of the original Contract Documents from the District, and to pay all costs of additional reproduction required by the Contractor.

- D. The purpose of the conference is to designate responsible personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established. The agenda may include the following:
1. Contractor's tentative schedules.
 2. Transmittal, review, and distribution of Contractor's submittals.
 3. Processing applications for payment.
 4. Maintaining of record documents.
 5. Critical work sequencing.
 6. Field decisions and Change Orders.
 7. Use of project site, office and storage areas, security, housekeeping, and District's needs.
 8. Major equipment deliveries and priorities.
 9. Contractor's assignments for safety and first aid.
- E. The Engineer will preside at the Preconstruction conference and will arrange for keeping the minutes and distributing the minutes to all persons in attendance.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01200 TESTING

PART 1 -- GENERAL

1.1 THE REQUIREMENT

The DISTRICT reserves the right to test soil compaction, and concrete to verify adherence to the Contract Documents. The CONTRACTOR shall provide all labor, equipment, and materials required to provide a safe working environment for the DISTRICT's personnel, including testing technicians, to obtain samples for this purpose.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02315, Excavation and Backfill
- B. Section 03300, Cast-in-Place Concrete

1.3 QUALITY ASSURANCE

- A. **Soils Testing:** The DISTRICT may provide soil compaction testing as described in Section 02315, Excavation and Backfill. The cost of initial testing shall be borne by the DISTRICT. If any initial test fails, then the cost of required subsequent tests shall be at the expense of the CONTRACTOR.
- B. **Concrete Testing:** The DISTRICT may provide testing to determine the compressive strength of concrete and grout used in the WORK. The cost of initial testing shall be borne by the DISTRICT. If any test fails, then the cost of subsequent tests shall be at the expense of the CONTRACTOR. Material samples shall be provided by the CONTRACTOR at no additional cost to the DISTRICT.
- C. **Hazardous Materials Testing:** The CONTRACTOR shall provide screening and testing of all demolition items that are potentially hazardous materials. Documentation of such testing shall be provided to the District's Representative prior to disposal.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 – GENERAL

1.01 SCOPE

- A. Payment for the various items of the Bid Form, as further specified herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of work being described, as necessary to complete the various items of work as specified and shown on the Drawings, including all appurtenances thereto, and including all costs of compliance with the regulations of public agencies having jurisdiction, including Safety and Health Requirements of the California Division of Industrial Safety. No separate payment will be made for any item that is not specifically set forth in the Bid Form, and all costs therefor shall be included in the prices named in the Bid Form for the various appurtenant items of Work.

1.02 BID SCHEDULE

- A. All pay line items will be paid for at the unit prices or lump sum prices named in the Bid Form for the respective items of work. The quantities of work or material stated as unit price items on the Bid Form are supplied only to give an indication of the general scope of the Work; the District does not expressly nor by implication agree that the actual amount of Work or material will correspond therewith.
- B. Allowance items will be paid at the actual cost of the Work, as discussed in Article 11.02 of the General Conditions. The values for allowance items are pre-entered on the bid form.
- C. Alternate unit price items may not be required for the work. No compensation will be due to the Contractor if an alternate item is not used.

1.03 SCHEDULE OF VALUES

- A. Contractor shall prepare a schedule of values for lump sum items, to be used as the basis for progress payments.

1.04 DESCRIPTION OF BID ITEMS

A. MOBILIZATION AND DEMOBILIZATION (Bid Item No. 1)

1. Measurement for payment for mobilization and demobilization will be based upon completion of such work as a lump sum, non-proratable pay item, and shall require completion of all of the items listed herein.
2. Payment for mobilization and demobilization will be made in two equal payments at the lump sum (LS) price named in the Bid Form under Item No. 1, which price shall constitute full compensation for all such work. The scope of work for mobilization shall include, but is not limited to, the obtaining of all bonds, insurance, and permits; moving equipment and material onto the site; and the furnishing and erecting of temporary buildings, and other construction facilities; notification of and coordination with affected utility owners, permitting agencies, local businesses and residents; all as required for the proper performance and completion of the Work. Payment for demobilization shall occur when all required items per the contract are fulfilled and the site is free of equipment and clean.
3. The mobilization and demobilization cost should be no more than ~~5%~~ 10% of construction cost for the respective lift station.

B. TRAFFIC CONTROL AND CONSTRUCTION AREA SIGNAGE (Bid Item No. 2)

1. Measurement for payment for traffic control will be based upon completion of all the necessary measures to temporarily control, detour, or stage traffic during construction, including construction signage, and all other related work per the Contract Documents.
2. Payment for traffic control will be made at the lump sum (LS) price named in the Bid Form under Item No. 2, which price shall constitute full compensation for the completion of all such work as required per the Contract Documents.

C. TEMPORARY SHEETING, SHORING AND BRACING (Bid Items No. 3)

1. Measurement for payment for temporary sheeting, shoring, and bracing or equivalent method will be based upon the completion of all planning, design, engineering, furnishing, and construction and the removal and disposal of all such temporary sheeting, shoring, and bracing for new construction as well as for protection of, support of, and bracing of existing utilities as a lump sum item, complete, as

required under the provisions of any permits, and in accordance with the requirements of OSHA and the Construction Safety Orders of the State of California, pursuant to the provisions of Section 6707 and Section 6705 of the California Labor Code.

2. Payment for temporary sheeting, shoring, and bracing or equivalent method will be made at the lump sum (LS) price named in the Bid Form under Item No. 3, which price shall constitute full compensation for completion of all such work as required per the contract documents.

D. LIFT STATION IMPROVEMENTS (Bid Item No. 4)

1. Measurement for payment for Lift Station improvements will be based upon completion of installing the new pump and equipment, removing and reinstalling the two existing pumps into the new wet well, including but not limited to, constructing the new wet well and valve vault, submersible pumps, inlet piping from the existing wet well to the new wet well, pump discharge piping, joints and fittings as required, new wet well base and top slab with access hatch, valves, valve vault access hatch, automatic transfer switch, pump controls, level sensors, concrete pads, cables and conduits, yard lighting, temporary pumping bypass, pump station testing, earthwork and site grading, including off-hauling and disposal of excess excavation materials, and all other related work as described in the Contract Documents. Piping measurement will be horizontally along the centerline of the pipe inclusive of fittings. Equipment measurement will be per unit. Also included in Bid Item No. 4 shall be all other items and appurtenances necessary for the Work related to the Lift Station that is not included in other Bid Items.
2. Payment for Lift Station Improvements will be made at the lump sum (LS) price named in the Bid Form under Item No.4, which price shall constitute full compensation for the completion of all such work as required per the Contract Documents.

E. LIFT STATION SCADA/MCC ALLOWANCE (Bid Item No. 5)

1. The Lift Station SCADA/MCC Allowance shall be compensation for work performed by the District's SCADA integrator, as directed in the Contract Documents. The allowance shall include materials, equipment, programming and support for start-up and testing. Additional items of work subcontracted to the District SCADA Integrator beyond those required in the Contract Documents (if any) shall be included in Bid Item No. 4.

2. Payment for Lift Station SCADA/MCC Allowance will be made at actual cost plus a 5% General Contractor's mark-up, which price shall constitute full compensation for the completion of all such work as required per the Contract Documents.

F. REMOVE AND DISPOSE UNSUITABLE MATERIALS (Alternate Bid Item No. 6)

1. Measurement for payment for removal and disposal of unsuitable subgrade materials will be based on the completion of all excavation, loading, transport and disposal at an appropriate class of landfill or facility, as a unit of weight as certified by the receiving landfill or facility.
2. Payment for removal and disposal of unsuitable materials will be made on a unit price per ton, named in the Bid Form under item Alternate Bid Item No. 6, which price shall constitute full compensation for the completion of all such work as required per the Contract Documents.

G. IMPORTED BACKFILL MATERIAL (Alternate Bid Item No. 7)

1. Measurement for payment for Imported Backfill Material will be based upon completion of supplying, placing and compacting suitable backfill material meeting the requirements of MCWD Standard Specification 02223 for use as subgrade below structural foundations.
2. Payment for Imported Backfill Material will be made on a unit price per cubic yard, measured in-place, named in the Bid Form under item Alternate Bid No. 7, which price shall constitute full compensation for the completion of all such work as required per the Contract Documents.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01300

SPECIAL PROJECT CONSTRAINTS

PART 1 - GENERAL

1.01 THE REQUIREMENT

- A. The CONTRACTOR shall provide all labor, equipment, and materials required to provide a safe working environment for its workers and the public, obtain all necessary permits and verify all existing utilities.
- B. Anything mentioned in these Specifications and not mentioned in other parts of the Contract Documents, shall be of like effect as though shown or mentioned in both. The ENGINEER will furnish from time to time such detail drawings, plans, profiles, and information, as the ENGINEER may consider necessary for the CONTRACTOR's guidance. The CONTRACTOR shall ascertain that the provisions in the Contract Documents be complied with in detail irrespective of the inspection given the work during its progress by the ENGINEER or other DISTRICT representative. Any failure on the part of the CONTRACTOR to comply with the provisions in the Contract Documents shall be sufficient cause for the rejection of the work at any time before its acceptance.
- C. The ENGINEER will review shop drawings submitted by the CONTRACTOR for general compliance with requirements of the Contract Documents. Corrections or comments made by the ENGINEER shall not relieve the CONTRACTOR from compliance with these requirements. The CONTRACTOR shall be responsible for confirming and correlating all quantities and dimensions; any changes or deviations from the Contract Documents; coordinating the work with all trades and subcontractors; and the accuracy and completeness of all submittals.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300, Temporary Facilities
- B. Section 02145, Bypassing Wastewater

1.03 CONSTRUCTION SCHEDULING

- A. The Contractor shall coordinate the Work to avoid interferences with normal operation of the sewers by the District.

- B. The CONTRACTOR shall prepare and submit a construction schedule to the ENGINEER. Prior to any construction activities on the WORK site, the CONTRACTOR shall obtain a favorable review of the construction schedule from the DISTRICT.
- C. The Contractor shall submit a construction staging plan for District approval.
- D. The Contractor shall submit a sewage pump around plan for District approval.
- E. All construction activities, including testing and cleanup, shall be completed pursuant to conditions of Section 2 in the Agreement, COMPLETION DATE AND DAMAGES, and within the number of calendar days for time of completion after the commencement date in the Notice to Proceed as shown in the Notice Inviting Bids.
- F. The Contractor shall not be permitted to work on weekends or holidays, and shall comply with the City of Marina's noise ordinance at all times.

1.04 PERMITS

- A. The Contractor shall abide by the conditions of all permits and shall obtain proof of satisfaction of conditions from issuers of permits, prior to acceptance of the Work by the District.
- B. The Contractor or District shall be responsible for obtaining the following permits and be responsible for the associated fees:
 - 1. City of Marina Encroachment Permit as required for Construction. Include traffic control plan with permit application.
 - 2. Permits for legal disposal of debris, refuse, and excess materials.
 - 3. RWQCB Permit for discharging water from dewatering operations.

1.05 PROJECT APPEARANCE

- A. The Contractor shall maintain a neat appearance to the work. In any area visible to the public, the following shall apply:
 - 1. The Contractor shall be responsive to public complaints regarding the appearance of the work area. For bidding purposes, the Contractor shall assume that his/her representative will attend a maximum of two public meetings to address public complaints, as requested by the Engineer.

2. When practicable, broken concrete and debris developed during clearing and grubbing shall be disposed of concurrently with its removal. If stockpiling is necessary, the material shall be removed or disposed of weekly.
 3. The Contractor shall furnish trash bins for all debris from construction. All debris shall be placed in trash bins daily. Materials that are to be reused shall be stacked neatly concurrently with their removal. Materials that are not to be reused shall be disposed of concurrently with their removal.
- B. Full compensation for conforming to the provisions in this section, not otherwise provided for, shall be considered as included in prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

1.06 AREAS FOR CONTRACTOR'S USE

- A. The District right-of-way shall be used only for purposes that are necessary to perform the required work. The Contractor shall not occupy the right-of-way or allow others to occupy the right-of-way for purposes that are not necessary to perform the required work.
- B. Use of the Contractor's work areas and other District-owned property shall be at the Contractor's own risk, and the District shall not be held liable for any damage to or loss of materials or equipment located within such areas.

1.07 PRESERVATION OF PROPERTY

- A. Existing trees, shrubs and other plants that are not to be removed as shown on the plans or specified in these special provisions and are injured or damaged by reason of the Contractor's operations shall be replaced by the Contractor. The minimum size of tree replacement shall be 24-inch box and the minimum size of shrub replacement shall be No. 15 container. The Contractor shall water replacement plants in conformance with the provision in Section 20-4.06, "Watering," of the City of Marina Standard Specifications.
- B. Damaged or injured plants shall be removed and disposed of outside the highway right-of-way in conformance with the provisions in Section 7-1.13 of the City of Marina Standard Specifications.
- C. Replacement planting of injured or damaged trees, shrubs and other plants shall be completed prior to the start of the plant establishment period.

1.08 MAINTAIN ACCESS TO BUSINESSES

- A. All work requiring lane closures outside the work zone in effect at any time as shown on the plans or specified in these special provisions shall be performed between the hours of 8:00 p.m. and 6:00 a.m., and shall be in writing by the Engineer.
- B. The Contractor shall provide for safe and orderly movement of vehicle and pedestrian traffic through the construction area at all times. Lane closures will be permitted only when it is considered safe to do so, and when impact to traffic will be minimal. Operating flashers shall be provided and maintained in working order on all barricades used for traffic control.
- C. A minimum of one paved traffic lane, not less than 11 feet wide, shall be open for use by public traffic in each direction of travel.
- D. The Contractor shall provide written notification to residents and property owners in the project area 72 hours (excluding weekends and holidays) in advance of the commencement of construction. The Contractor shall provide a sample notification form for the Engineer's review and approval prior to beginning work.
- E. Street parking may be restricted as necessary to facilitate construction activity, subject to the approval of the Engineer on a case-by-case basis. Once approved by the Engineer, the Contractor will notify residents and or businesses 72 hours in advance of all operations requiring vehicles to be removed from the street work areas and will post District furnished temporary "NO PARKING" signs (maximum 100 feet apart) on each side of the street 72 hours prior to the scheduled work day for each work area. The Contractor's posting will provide for work on the day scheduled and the following work day. No parking signs shall include the following information: Time, day, date, purpose and the following statement: "Violators will be towed at owner's expense. CVC 22651". If the work is not performed during this period, the street work will have to be rescheduled with 5 working days advance notice. The Contractor shall leave the streets open to traffic until just prior to starting the work, and will provide all barricades, signs and traffic control necessary to protect the work. The Contractor will perform all re-posting of no parking signs and re-notification occasioned by his failure to meet the posted schedule. All streets shall be open to traffic between the hours of 5:00 p.m. and 8:00 a.m.
- F. The Contractor shall file with the Engineer and Police Department the name and telephone number of the representative to be notified after normal working hours and on weekends and holidays, in case of emergencies.

Designated legal holidays are January 1st, the third Monday in January, the 3rd Monday in February, the last Monday in May, July 4th, the 1st Monday in September, November 11th, Thanksgiving Day, and December 25th. When a designated legal holiday falls on a Sunday, the following Monday shall be a designated legal holiday. When November 11th falls on a Saturday, the preceding Friday shall be a designated legal holiday.

The Contractor shall plan and/or request normal working-hour and after-hour lane closures and will make all reasonable efforts not to schedule lane closures on designated legal holidays or on scheduled event days.

1.09 WORK HOURS AND TRAFFIC CONTROL

- A. Work hours will be between 8:00 a.m. and 4:00 p.m., or so required in the City of Marina Encroachment Permit. No work shall be performed outside of these hours without the prior written consent of the District's Representative. In the event of an emergency, the District's Representative may issue verbal consent for work outside of these hours.
- B. Traffic control measures shall be set up between 7:00 a.m. and 8:00 a.m. daily.
- C. Traffic control measures shall be taken down and the street in adequate condition for traffic between 4:00 p.m. and 5:00 p.m. daily, or as stipulated by the City of Marina Encroachment Permit.

1.10 CONSTRUCTION CONSTRAINTS

- A. **General:** The project site consists of the Imjin Lift Station on Imjin Road, in Marina, California.

The project objective is to upgrade the facilities at the deficient lift station to provide reliable and adequate capacity for anticipated growth.

Every reasonable effort shall be taken by the CONTRACTOR to execute the work in accordance with the construction constraints presented in this section, to complete the WORK as expeditiously as possible, and to minimize disruption. Construction activities shall remain within construction easements or public rights-of-way. The CONTRACTOR shall restore all impacted improvements to their pre-construction conditions upon completion of the project. Both sites have percolation ponds adjacent to the project site, and every reasonable effort shall be taken by the CONTRACTOR to protect said property.

- B. **Construction Sequence:** A suggested construction sequence is presented herein. The sequence of activities listed is only one method for accomplishing the project WORK. In accordance with the Contract Documents, the CONTRACTOR shall submit and follow its own schedule independent of suggested construction sequence.

Information contained in this section is provided to assist the CONTRACTOR in understanding the construction complexity and contract conditions. No attempt has been made to include all of the construction tasks and constraints listed within the Contract Documents.

Suggested Construction Sequence:

TASK	DESCRIPTION
1	Submit all required insurance, bonds, and technical submittals.
2	Complete preconstruction survey of existing conditions.
3	Perform video inspection of each of the project sites.
4	Perform utility locating work as required.
5	Set up traffic control if needed.
6	Construct new wet well and valve vault, including installation of single new pump.
7	Perform Wastewater Bypass Pumping.
8	Make connections from old wet well to new wet well, and from new pump discharge pipe to existing force main. Move existing two pumps from the existing wet well to the new wet well. Complete all remaining demo and abandonment work.
9	Complete all remaining work including electrical and controls, testing, surface restoration, and final cleanup.
10	Punch list items.

- C. **Construction Duration:** The CONTRACTOR shall complete all project Work pursuant to the conditions of Section 2 in the Agreement, COMPLETION DATE AND DAMAGES, and within 150 calendar days after the commencement date in the Notice to Proceed.

1.11 AMOUNT OF LIQUIDATED DAMAGES AND SPECIAL PENALTIES

- A. **Failure to Meet Completion Dates:** The amount of liquidated damages for which extensions of time have not been granted are pursuant to the conditions of Section 2 in Agreement, commencement date and damages.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 ASSESSMENT TO ESTABLISH PRECONSTRUCTION CONDITIONS

- A. The CONTRACTOR shall perform a preconstruction assessment and make an overall evaluation of the condition of structures, sidewalks, driveways, fences, paved paths, roads, road crossings, railroad crossings, and other public or private property in the vicinity of the work, and as applicable, which might be damaged during construction activities.
- B. The overall scope of the preconstruction assessment shall be to establish the state of condition of the area of work prior to construction.
- C. The CONTRACTOR shall record and document all observations and, as necessary, shall include descriptive notes, sketches, detailed drawings, and photographs. Photographs shall be taken with automatic dated cameras. Videotapes may be used when deemed necessary and/or prudent.
- D. When conducting examinations of structures, the CONTRACTOR shall pay special attention to all visible cracks, earth slides, and any other evidence of weakness or defects.
- E. The records and documentation are intended for use as indisputable evidence in ascertaining the extent of any damage that may occur as a result of the CONTRACTOR's operations and are for the protection of the adjacent property owners, the CONTRACTOR, and the DISTRICT. The records and documentation will be a means of determining whether and to what extent damage resulting from the CONTRACTOR's operations occurred during the contract work. The Contractor will need to apply for an Encroachment Permit with the City of Marina for use of the area adjacent to the site as a laydown area. Any damage to existing improvements caused by the Contractor shall be repaired or replaced as directed by the District.

3.02 PROGRESS MEETINGS

The CONTRACTOR shall prepare for and attend weekly progress meetings. The purpose of these meetings will be to review progress, coordinate activities, resolve issues, and discuss changes. The DISTRICT will select the location and time for the meetings. The ENGINEER will convene the meetings, preside over the meetings, and provide for keeping and distributing the meeting minutes.

3.03 NOTIFICATION REQUIREMENT TO VARIOUS REGULATORY AGENCIES

It is the obligation of the CONTRACTOR to make certain that all appropriate agencies have been notified. The CONTRACTOR shall provide notice, in writing, at least

seventy-two (72) hours prior to start of construction. The listing of agencies herein shall not be deemed to relieve the CONTRACTOR of its duty to notify any other agencies as required. Agencies to be contacted shall include, but not be limited to, the City of Marina Police and Fire Departments.

3.04 MISCELLANEOUS CONSTRAINTS

- A. The CONTRACTOR shall not overfill haul trucks, shall promptly clean-up spills, and shall maintain safe truck speeds. No oversize or overweight trucks shall be used by the CONTRACTOR without prior approval of the DISTRICT.
- B. The CONTRACTOR shall coordinate with the utility companies and notify the DISTRICT at least seven (7) working days before any planned utility disruption.
- C. The CONTRACTOR shall implement construction best management practices for minimizing emissions from all air pollutants, with special focus towards minimizing impacts associated with ozone, PM10, and CO. These measures include, but are not limited to: wet and cover any stockpiles of earth; wet and cover all materials transported off-site; limit the speed of all construction vehicles to 15 miles per hour; and turn off engines of vehicles idling more than 5 minutes.
- D. Both sites have existing percolation ponds which are property of the County and are essential elements to the County and local flood control. All activities by the Contractor shall be considered with respect to protection of the percolation ponds. If any issue presents itself that may impact the integrity and/or function of the percolation ponds, this shall be brought to the immediate attention of the District's Representative and shall be approved before proceeding with potentially damaging work.

3.05 UTILITY LOCATING

Five (5) working days prior to the initiation of construction for any specific portion of the project, the CONTRACTOR shall be responsible for locating all existing utilities in areas to be excavated marked in the field as a result of the Underground Service Alert notification process to verify their horizontal alignments and vertical elevations.

END OF SECTION

SECTION 01310

COORDINATION

PART 1 - GENERAL

The Contractor shall be responsible for the coordination of all work and the coordination of the work of all subcontractors. The Contractor shall not delegate coordination to any subcontractor. Coordination, as referred to herein, shall include the establishment of on-site lines of authority and communication and assistance in scheduling of and attendance of progress meetings between the Engineer or the District and the Contractor and its subcontractors. The Contractor's onsite supervisory person shall be present and represent the General Contractor whenever a meeting is held that involves any interface between the District and any subcontractors or suppliers.

1.01 SCHEDULING

- A. The Contractor shall prepare construction schedules as specified in Sections 01330 "Contractor Submittals" and 01300 "Special Project Constraints", and all schedule submittals shall conform to the requirements specified therein.

1.02 ARRANGEMENTS FOR TEMPORARY CONSTRUCTION FACILITIES

- A. The Contractor shall be responsible for the allocation of space for temporary field offices and structures furnished by itself or its subcontractors; monitoring the use of temporary utilities; verification that adequate services are provided to comply with requirements for Work and climatic conditions; and the administration of traffic and parking controls. All such work shall be in strict conformance with the applicable requirements specified in Sections 01510 "Temporary Utilities" and elsewhere in this Division 1.

1.03 REQUESTS FOR SUBSTITUTIONS

- A. The Contractor shall review subcontractor's requests for changes and for substitutions.
- B. Attention is directed to the requirements governing the submittal of proposed substitutions of products by the Contractor or any of its subcontractors. All requests or substitutions shall conform to the requirements of Section 01330 "Contractor Submittals".

1.04 GENERAL COORDINATION

- A. All Work covered in the Contract Documents shall be coordinated as a part of the Contractor's obligations under the Contract.
- B. The Contractor shall assure timely fabrication of work, erection of work, and completion of closeout items and the timely preparation of shop drawings and other submittals in conformance with the approved construction schedule.
- C. The Contractor shall coordinate the efforts of all individuals and subcontractors in the execution of the Work, including work by others as specified in Section 01110, "Summary of Work".
- D. The Contractor shall resolve differences or disputes between subcontractors concerning coordination, interferences, or extent of work between Sections. The Contractor's decisions, if consistent with the Contract Document requirements, shall be final.

1.06 SPECIAL COORDINATION

- A. Drawings showing the location of equipment, piping, and various appurtenances, are diagrammatic only. Although every effort has been made to provide adequate routing and placement, actual job conditions may not permit their locations in the field where indicated on the drawings. Whenever this condition is encountered by the Contractor, he or she shall notify the Engineer immediately to obtain the Engineer's determination of any necessary relocation. Minor adjustments in locations or rerouting due to ill-timed or improper sequence of trades shall be the responsibility of the Contractor and shall be performed at no additional cost to the District.
- B. The Contractor shall provide advance notification to the Engineer of specific tasks and inspections specified. Failure to provide such advance notification may be cause for rejection of the Work.
- C. Wherever prefabricated items are to be incorporated into the Work, the Contractor shall use templates and shall set fasteners accurately to the templates.
- D. The Contractor shall verify all dimensions to assure that all components will fit together properly. Particular care shall be exercised to assure workability, access, symmetry, and alignment of components. Whenever the Contractor is in doubt of the intended effect of the Contract Documents, a request for information or clarification shall be tendered in writing to the Engineer prior to layout of project elements.

- E. For demolition items, Contractor shall provide screening and testing for hazardous materials such as lead-based paint and asbestos-containing materials. The Contractor shall provide the District's Representative with written notice that the demolition items have been tested prior to disposal. If hazardous materials are found, Contractor will be responsible for proper handling and transport to a suitable landfill that will accept the class of hazards discovered for disposal. The alternate Bid Item No. 9 is to be used if hazardous materials are discovered.

1.07 COORDINATION OF SUBCONTRACTOR RESPONSIBILITIES

- A. The Contractor shall be responsible for coordination of the Work of each of its subcontractors and suppliers. Special attention is directed to the following obligations of the Contractor:
 - 1. Verify that subcontractors have obtained permits for inspections.
 - 2. Review all subcontractor shop drawings, product data, and sample submittals for compliance with Contract Documents prior to submittal to Engineer for general review for compliance with design intent.
 - 3. Maintain onsite documentation and keep current record drawing set at Project site.
 - 4. Verify that specified cleaning is done during progress of Work and at completion of each subcontract.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01330
CONTRACTOR SUBMITTALS

PART 1 – GENERAL

1.01 SUMMARY

- A. This section describes general requirements for submittals for the Work.
- B. Related Sections
 - 1. Section 00700, 6.17: Shop Drawings and Samples
 - 2. Section 01110: Summary of Work
 - 3. Section 01270: Measurement and Payment
 - 4. Section 01770: Project Closeout

1.02 PROCEDURES

- A. Submit at Contractor's expense, six (6) sets, Schedule of Shop Drawing and Sample Submittals, Safety Plans, Progress Schedules, Product Data, Shop Drawings, Samples, Storm Water Pollution Prevention Plan, Substitution Requests, Quality Control Data, Operations and Maintenance Manuals, and Project Record Documents, and all other submittals required by the Contract Documents. Submit these submittals to Engineer for review and approval. Construction Schedule, Schedule of Shop Drawings and Sample Submittals, Safety Plans, Storm Water Pollution Prevention Plan, and Substitution Requests shall be completed within ten (10) working days after receipt of Notice to Proceed from the District. The Trench Safety Plan shall be submitted prior to any underground work.

A Preliminary Progress Schedule shall be required at the Pre-construction Meeting.

Contractor shall submit a "Letter of Responsibility," on company letterhead, indicating the names and telephone numbers of at least three different persons who shall be available to be contacted in case of emergency at any time during the life of the contract. Said persons must have decision-making authority within the company.

- B. Use a submittal transmittal form, in duplicate, containing:

- Date, and revision date and submittal log number.
- Project title and District's Project number.
- Contractor's name and address and job number.
- Specification Section clearly identified.
- The quantity of each Shop Drawing, Product Data, and Samples submitted.
- Notification of deviations from Contract Documents.
- Materials safety data sheet (MSDS) for each item complying with OSHA's Hazard Communication Standard 29 CFR 1910.1200.
- Other pertinent data.

Where manufacturer's standard drawings or data sheets are used, they shall be marked clearly to show those portions of the data that are applicable to this project. Submittals shall be submitted based on each technical specification section. Submittals containing information about more than one specification section will be returned for resubmittal. Submittals shall include all information requested by each specification section. (No partial submittals.) Incomplete submittals will be returned not reviewed by Engineer. Provide a log number and reference to Specifications Section and/or Plan sheets and details, for each submittal for ease of identification of submittal. Submittal shall include:

- Date and revision dates.
- Revisions, if any, identified.
- Project Title and number.
- The names of: Engineer, Contractor, Subcontractor, Supplier, Manufacturer, and separate detailer, when pertinent.
- Identification of product material by location within the Project.
- Relation to adjacent structure or materials.
- Field dimensions, clearly identified as such.
- Specification Section number and applicable detail reference numbers on the drawings.
- Applicable standards, such as ASTM, ANSI, FS, NEMA, SMACNA or ACI.
- A blank space, on each Drawings or data sheet, 5" x 4" for the Engineer's stamp.
- Identification of deviations from Contract Documents.
- Contractor's stamp, initialed or signed, with language certifying the review of submittals, verification of field measurements, construction criteria and technical standards in compliance with Contract Documents.

- C. The data shown on the Shop Drawings shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to show Engineer the materials and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes specified below. Samples shall be identified clearly as to material, supplier, pertinent data such as catalog numbers and the use for which it is intended and otherwise as Engineer may require to enable Engineer

to review the submittal. The number of each Sample to be submitted will be as specified in the Specifications.

- D. At the time of each submission, Contractor shall give Engineer and District specific written notice of all variations, if any, that the Shop Drawing or Sample submitted may have from the requirements of the Contract Documents, and the reasons therefore. This written notice shall be in a written communication attached to the submittal transmittal form. In addition, Contractor shall cause a specific notation to be made on each Shop Drawing and Sample submitted to Engineer for review and approval of each such variation. If the District accepts deviation, the District shall note its acceptance on the returned submittal transmittal form and, if necessary, issue appropriate Contract Modification.
- E. Submittal coordination and verification is responsibility of Contractor; this responsibility shall not be delegated in whole or in part to subcontractors or suppliers. Before submitting each Shop Drawing or Sample, Contractor shall have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents, and shall have determined and verified:
 - 1. All field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar information with respect thereto;
 - 2. All materials with respect to intended use, fabrication, shipping, handling, storage, assembly and installation pertaining to the performance of the Work; and
 - 3. All information relative to Contractor's sole responsibilities and of means, methods, techniques, sequences and procedures of construction and safety precautions and programs incident thereto.
- F. Contractor's submission to the District or to the Engineer of a Shop Drawing or Sample submittal will constitute Contractor's representation that it has satisfied its obligations under the Contract Documents, and as set forth immediately above, with respect to Contractor's review and approval of that submittal.
- G. Designation of Work "by others", if shown in submittals, shall mean that work will be responsibility of Contractor rather than subcontractor or supplier who has prepared submittals.
- H. After review by the District or Engineer of each of Contractor's submittals, four (4) sets of material will be returned to Contractor with actions defined as follows:

1. **NO EXCEPTIONS TAKEN** – A formal revision and resubmission of said submittal will not be required. Accepted subject to its compatibility with future submittals and additional partial submittals for portions of the work not covered in this submittal. Does not constitute approval or deletion of specified or required items not shown on the submittal.
 2. **MAKE CORRECTIONS NOTED (NO RESUBMISSIONS REQUIRED)** – Same as 1. above, except that minor corrections as noted shall be made by Contractor.
 3. **AMEND AND RESUBMIT** - Rejected due to minor inconsistencies or errors that shall be resolved or corrected by Contractor prior to subsequent review by Engineer.
 4. **REJECTED - RESUBMIT** - Rejected due to major inconsistencies or errors that shall be resolved or corrected by Contractor prior to subsequent review by Engineer.
- I. Contractor shall make a complete and acceptable submittal at least by second submission. The District reserves the right to deduct monies from payments due Contractor to cover additional costs of review beyond the second submission. Illegible submittals will be rejected and returned to Contractor for resubmission. Contractor shall be in breach of Contract if, following a submittal which the District or Engineer determines falls within categories 3 or 4 above, Contractor's first resubmittal does not fall within categories 1 or 2 above.
- J. Favorable review will not constitute acceptance by the District or Engineer of any responsibility for the accuracy, coordination and completeness of the submittals. Accuracy, coordination, and completeness of Submittals shall be sole responsibility of Contractor, including responsibility to backcheck comments, corrections, and modifications from the District or Engineer's review before fabrication. Contractor, subcontractors, or suppliers may prepare submittals, but Contractor shall ascertain that submittals meet requirements of Contract Documents, while conforming to structural space and access conditions at point of installation. Engineer's review will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as indicated by the Contract Documents. Favorable review of submittal, method of work, or information regarding materials and equipment Contractor proposes to furnish shall not relieve Contractor of responsibility for errors therein and shall not be regarded as assumption of risks or liability by the District or Engineer, or any officer or employee thereof, and Contractor shall have no claim under Contract on account of failure or partial failure or inefficiency or insufficiency of any plan or method of work or material and equipment so accepted. Favorable review shall be considered to mean merely

that the District and/or Engineer has no objection to Contractor using, upon his own full responsibility, plan or method of work proposed, or furnishing materials and equipment proposed.

- K. The District and/or Engineer's review will not extend the means, methods, techniques, sequences or procedures of construction or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
- L. Submit complete initial submittal for those items where required by individual specification Sections. Complete submittal shall contain sufficient data to demonstrate that items comply with Specifications, shall meet minimum requirements for submissions cited in technical specifications, shall include motor data and seismic anchorage certifications, where required, and shall include necessary revisions required for equipment other than first named. If the Contractor submits an incomplete initial submittal, when complete submittal is required, submittal may be returned to Contractor without review.
- M. It shall be Contractor's responsibility to copy, conform and distribute reviewed submittals in sufficient numbers for Contractor's files, subcontractors and vendors.
- N. After District and/or Engineer's review of submittal, revise as noted and resubmit as required. Identify changes made since previous submittal.
 - 1. Begin no fabrication or work that requires submittals until return of submittals not requiring resubmittal.
 - 2. Normally, submittals will be processed and returned to Contractor within ten (10) working days of receipt.
- O. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.
- P. All shop drawings and submittals shall be number identified by Contractor, prior to submission to Engineer, in accordance with the following:
 - 1. Contractor shall sequentially number each submittal (i.e., "1", "2", "3", etc.) as the basis for number identification of all shop drawings and submittals.
 - 2. Affix the submittal number under which each submittal is made on every copy of each shop drawing, product data, sample, certification, O & M manual, etc.

3. If the submittal is a resubmittal (including without limitation after an initial submittal is rejected, returned not reviewed or marked revise as noted and resubmit), add the suffix designation "A" (i.e., a resubmittal of submittal 1 would be numbered 1A). Subsequent resubmittals would be identified by the submittal number and sequential letters (i.e., "B", "C", "D", etc.).
4. All submittals shall include all information requested by each specification section. No partial submittals will be accepted unless previously authorized by Engineer. In the event a partial submittal is authorized, each subsequent different submittal (as opposed to resubmittal) is given a new number.

Q. Number of resubmissions:

1. One reexamination of Contractor's submittals that have been returned for correction or replacement will be included in Engineer's scope. Any additional reexamination of Contractor's submittals will be considered additional scope services to be paid by Contractor through the District. Engineer shall be paid hourly at 2.5 times direct payroll expenses and charge consultants time at 1.25 times the amount billed Engineer.

1.03 SCHEDULE OF SHOP DRAWING AND SAMPLE SUBMITTALS

- A. Submit preliminary Schedule of Shop Drawing and Sample Submittals as required. Submit two (2) copies of final schedule of submittals of shop drawings and samples as required, and in no event later than five (5) working days following Notice to Proceed.
- B. Schedule of Shop Drawing and Sample Submittals will be used by District and Engineer to schedule their activities relating to review of submittals. Schedule of submittals shall indicate a spreading out of submittals and early submittals of long lead-time items and of items that require extensive review.
- C. Schedule of Shop Drawing and Sample Submittals shall be reviewed by Engineer and shall be revised and resubmitted until accepted by Engineer.
- D. Unless otherwise specified, make submittals in groups containing all associated items to assure that information is available for checking each item when it is received. Identify on the submittal which submittals should be reviewed together.

1.04 DELAY OF SUBMITTALS

- A. Delay of submittals by Contractor is considered avoidable delay. Liquidated damages incurred because of late submittals will be assessed to Contractor.

1.05 RECORD DRAWINGS

- A. General: The Contractor shall keep and maintain, at the job site, one record set of Contract Drawings. On these, it shall mark all project conditions, locations, configurations, and any other changes or deviations which may vary from the details represented on the original Contract Drawings, including buried or concealed construction and utility features which are revealed during the course of construction.
- B. Special attention shall be given to recording the horizontal and vertical location of all buried utilities that differ from the locations indicated, or which were not indicated on the Contract Drawings. Said record drawings shall be supplemented by any detailed sketches as necessary or directed to indicate, fully, the Work as actually constructed.
- C. These master record drawings of the Contractor's representation of "as-built" conditions, including all revisions made necessary by addenda, change orders, and the like shall be maintained up-to-date during the progress of the Work.
- D. In the case of those drawings which depict the detail requirement for equipment to be assembled and wired in the factory, the record drawings shall be updated by indicating those portions which are superseded by change order drawings or final shop drawings, and by including appropriate reference information describing the change orders by number and the shop drawings by manufacturer, drawing, and revision numbers.
- E. Record drawings prepared by the Contractor shall be accessible to the Engineer at all times during the construction period and shall be delivered to the Engineer upon completion of the work.
- F. Effect on Progress Payments: Requests for partial payments will not be approved if the record drawings are not kept current. All such Record Drawings will be inspected by the Engineer each month, showing all variations between the Work as actually constructed and as originally shown on the Contract Drawings or other Contract Documents, and the District will not process monthly payment requests until such drawings are made current each month.
- G. Final Record Drawings: Upon substantial completion of the Work and prior to final acceptance by the District, the Contractor shall complete and deliver one blueline set with legible red-line changes dated and signed by the Contractor to the Engineer for approval. The redline changes shall conform to the construction records of the Contractor. This information will be assumed to be reliable, and the Engineer will not be responsible for the accuracy of such information, nor for any errors or omissions which may appear on the Record

Drawings as a result. Once the blue-lines have been reviewed and approved by the Engineer, the Engineer will transfer the redline changes to the original mylars for Record Drawings.

- H. Effect on Final Payment: Final payment will not be approved until the Contractor-prepared blueline Record Drawings have been delivered to the Engineer. Said up-to-date, Record Drawings will be one set of prints with carefully plotted and legible information overlaid in red pencil.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01420

REFERENCE STANDARDS

PART 1 - GENERAL

1.01 GENERAL

- A. Titles of Sections and Paragraphs: Captions accompanying specification sections and paragraphs are for convenience of reference only, and do not form a part of the Specifications.
- B. Applicable Publications: Whenever in these specifications references are made to published specifications, codes, standards, or other requirements, it shall be understood that wherever no date is specified, only the latest specifications, standards, or requirements of the respective issuing agencies which have been published as of the date of Bid Opening, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the Drawings shall be waived because of any provision of, or omission from, said standards or requirements.
- C. Specialists, Assignments: In certain instances, specifications text requires (or implies) that specific Work is to be assigned to specialists or expert entities, who must be engaged for the performance of that Work. Such assignments shall be recognized as special requirements over which the Contractor has no choice or option. These requirements shall not be interpreted so as to conflict with the enforcement of building codes and similar regulations governing the Work; also they are not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of Work is recognized as "expert" for the indicated construction processes or operations. Nevertheless, the final responsibility for fulfillment of the entire set of contract requirements remains with the Contractor.

1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Without limiting the general provisions of other portions of the specifications, all Work specified herein shall conform to or exceed the requirements of all applicable codes and the applicable requirements of the following documents to the extent that the provisions of such documents are not in conflict with the requirements of these Specifications nor the applicable codes.

- B. References herein to codes shall mean the following listed codes, editions as adopted by the Marina Coast Water District, including all addenda, modifications, amendments, or other lawful changes thereto:

Uniform Building Code, published by the International Conference of Building Officials (ICBO).

Uniform Plumbing Code, published by the International Association of Plumbing and Mechanical Officials (IAPMO).

Uniform Mechanical Code, published by the International Conference of Building Officials (ICBO).

National Electric Code, published by the National Fire Protection Association (NFPA).

Uniform Fire Code, published by the International Conference of Building Officials (ICBO).

California Code of Regulations; Title 8 Industrial Relations, Title 19 Public Safety, Title 24 Building Standards, and California Labor Code.

- C. In case of conflict between codes, reference standards, drawings and the other Contract Documents, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the Engineer for clarification and directions prior to ordering or providing any materials or labor. The Contractor shall bid the most stringent requirements.
- D. Applicable Utility Regulations: Regulations and tariffs utilized by the utility companies shall govern minimum utility-related requirements for the Work. Where such utility regulations conflict with the technical specifications, the more stringent provision shall apply. Upon discovery, any and all such conflicts shall be brought to the immediate attention of the Engineer prior to proceeding with the Work.
- E. Applicable Standard Specifications: The Contractor shall construct the Work specified herein in accordance with the requirements of the Contract Documents and the referenced portions of those referenced codes, standards, and specifications listed herein; except, that whenever references to "Standard Specifications" are made, the provisions therein for measurement and payment shall not apply.
- F. References in the Contract Documents to "State Standard Specifications" or "Standard Specifications" shall mean the current metric edition as

adopted by the State of California, Department of Transportation ("Caltrans").

- G. References in the Contract Documents to "Marina Coast Water District Standard Specifications" or "District Standard Specifications" shall mean the Marina Coast Water District Standard Specifications for Sanitary Sewer Construction, current edition at the time of bid opening.
- H. References in the Contract Documents to "State Standard Plans" or "Standard Plans" shall mean the current metric edition as adopted by the State of California, Department of Transportation ("Caltrans").
- I. References in the Contract Documents to "Marina Coast Water District Standard Details", "District Standard Details" or "Standard Details" shall mean the Marina Coast Water District, Standard Details, current editions at the time of bid opening.
- J. References herein to "Cal-OSHA" shall mean State of California, Department of Industrial Relations, General Industry, Electrical and Construction Safety Orders, as amended to Date, and all changes and amendments thereto which are effective as of the date of construction.
- K. References herein to "OSHA Standards" shall mean Title 29, Part 1910, Occupational Safety and Health Standards, Code of Federal Regulations (OSHA), including all changes and amendments thereto.
- L. Wherever the following terms are used, the intent and meaning shall be:

<u>Abbreviation</u>	<u>Stands For</u>
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ANSI	American National Standard Institute
AREA	American Railway Engineering Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
STM	American Society of Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
Cal/OSHA	State of California Department of Industrial Relations, Division of Occupational Safety and Health
CARB	California Air Resources Board
CBR	California Bearing Ratio
CISPI	Cast Iron Soil Pipe Institute

CLFMI	Chain Link Fence Manufacturers Institute
EPA	U.S. Environmental Protection Agency
ETL	Electrical Testing Laboratory
FHWA	U.S. Department of Transportation, Federal Highway Administration
FS	Federal Specifications
IAPMO	International Association of Plumbing and Mechanical Officials
ICBO	International Conference of Building Officials
IEEE	Institute of Electrical and Electronic Engineers
NBS	National Bureau of Standards
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
UBC	Uniform Building Code
UL	Underwriters Laboratories
USFWS	United States Fish and Wildlife Service

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01450
QUALITY CONTROL

PART 1 - GENERAL

1.01 SITE INVESTIGATION AND CONTROL

- A. The Contractor shall verify all dimensions in the field and shall check all field conditions continuously during construction. The Contractor shall be solely responsible for any inaccuracies built into the Work.
- B. The Contractor shall inspect related and appurtenant work and shall report in writing to the Engineer, any conditions which will prevent proper completion of the Work. Any required removal, repair, or replacement caused by them shall be done by the Contractor's work at its sole cost and expense.

1.02 INSPECTION OF THE WORK

- A. General: The Work shall be conducted under the general observation of the Engineer and shall be subject to inspection by representatives of the District to assure strict compliance with the requirements of the Contract Documents.
- B. The authorized representative of the Engineer on the project site shall be the Project Engineer acting directly and through various inspectors at the site. The presence of the Inspectors, however, shall not relieve the Contractor of the responsibility for the proper execution of the Work in accordance with all requirements of the Contract Documents. Compliance is distinctly a duty of the Contractor, and said duty shall not be avoided by any act or omission on the part of the inspector(s).
- C. All materials and articles furnished by the Contractor shall be subject to rigid inspection, and no material or articles shall be used in the Work until it has been inspected and accepted by the Engineer or the District.
- D. Inspection at Place of Manufacture: Unless otherwise specified, all products, materials, and equipment shall be subject to inspection by the Engineer at the place of manufacture.
- E. The presence of the Engineer at the place of manufacture however, shall not relieve the Contractor of the responsibility for furnishing products, materials, and equipment that comply with all requirements of the Contract Documents.

1.03 SAMPLING AND TESTING

- A. Unless otherwise specified, all sampling and testing shall be in accordance with the methods prescribed in the current standards of the ASTM or other specified published standards, as applicable to the class and nature of the article or materials considered; however, the District reserves the right to use any generally-accepted system of sampling and testing which, in the opinion of the Engineer will assure the District that the quality of the workmanship is in full accord with the Contract Documents.
- B. Any waiver by the District of any specific testing or other quality assurance measures, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief from the specified testing or other quality assurance requirements as originally specified, and whether or not such guarantee is accompanied by a "performance bond" to assure execution of any necessary corrective or remedial Work, shall not be construed as a waiver of any prescriptive or performance requirements of the Contract Documents. "Performance bond" as used herein is a separate bond in addition to the Contract Performance Bond required in the General Conditions.
- C. Notwithstanding the existence of such waiver, and in addition to any testing and inspection performed by any other inspector on behalf of the District or any other public agency having jurisdiction, the Engineer shall have the right to make independent investigations and tests, and failure of any portion of the Work to meet any of the requirements of the Contract Documents, shall be reasonable cause for the Engineer to require the removal or correction and reconstruction of any such work in accordance with the General Conditions.

1.04 TIME OF INSPECTIONS AND TESTS

- A. Samples and test specimens required under the Contract Documents shall be furnished by the Contractor and prepared for testing in ample time for the completion of the necessary tests and analyses before the subject materials or articles are to be used. The Contractor shall furnish all required test specimens at its own expense. Except as otherwise provided in the Contract Documents, performance of the required initial test and first re-test will be by the District, and all costs therefor will be borne by the District; except, that the cost of any test after the first re-test shall be borne by the Contractor.
- B. Whenever the Contractor is ready to backfill, bury, cast in concrete, hide, or otherwise cover or make inaccessible any work under the Contract, the Contractor shall notify the Engineer not less than 48 hours in advance of

beginning any such work of backfilling, burying, casting in concrete, hiding, covering, or making inaccessible any portion of the Work to be inspected, so that the required inspections can be scheduled and performed. Failure of the Contractor to notify the Engineer at least 48 hours in advance of any such inspections shall be reasonable cause for the Engineer to require sufficient delay in the Contractor's schedule to allow time for such inspections and any remedial or corrective work required, and all costs of such delays, including its impact or effect upon other portions of the Work shall be borne by the Contractor.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01510

TEMPORARY UTILITIES

PART 1 - GENERAL

- A. It shall be the Contractor's responsibility to provide plant and equipment that is adequate for the performance of the Work under this Contract within the time specified. All plant and equipment shall be kept in satisfactory operating condition, shall be capable of safely and efficiently performing the required Work.

1.01 POWER AND LIGHTING

- A. Power: The Contractor shall provide all necessary temporary power required for its operations under the Contract, and shall provide and maintain all temporary power lines required to perform the Work in a safe and satisfactory manner.
- B. Construction Lighting: All Work conducted at night or under conditions of deficient daylight shall be suitably lighted to insure proper Work and to afford adequate facilities for inspection and safe working conditions.
- C. Approval of Electrical Connections: All temporary connections for electricity shall be subject to approval of the District, the Engineer and the power company representative, and shall be removed in like manner at the Contractor's expense prior to final acceptance of the Work by the District.
- D. Separation of Circuits: Unless otherwise permitted by the Engineer, circuits separate from lighting circuits shall be used for all power purposes.
- E. Construction Wiring: All wiring for temporary electric light and power shall be properly installed and maintained and shall be securely fastened in place. All electrical facilities shall conform to the requirements of Title 8, Industrial Relations, Subchapter 5, Electrical Safety Orders, California Administrative Code; and Subpart K of the OSHA Safety and Health Standards for Construction.

1.02 PUMPING BYPASS

- A. General: The Contractor shall provide and maintain all necessary temporary pumping bypass in order to maintain the pump stations operation during the construction. Details on wastewater bypass is in Section 02145.

1.03 WATER SUPPLY

- A. General: The Contractor will arrange with the Marina Coast Water District a source of water as required by the Contractor in performance of the Work under the Contract. The Contractor shall provide all facilities necessary to convey the water from the District-designated source to the points of use in accordance with the requirements of the Contract Documents. Construction water will be available for a charge from the District's fire hydrants. The Contractor will be required and pay a quantity charge for the water used upon return of the meter to apply for and furnish a deposit for use of the District's construction meter.

- B. Water Connections: The Contractor shall not make connection to, or draw water from, any fire hydrant or pipeline without first obtaining permission of the District or other authority having jurisdiction over the use of said fire hydrant or pipeline and from the agency owning the affected water system. For each such connection made, the Contractor shall first attach to the fire hydrant or pipeline a valve and a construction meter, supplied by the District or said other authority and agency.

- C. Removal of Water Connections: Before final acceptance of the Work on the project, all temporary connections and piping installed by the Contractor shall be entirely removed, and all affected improvements shall be restored to their original condition, or better, to the satisfaction of Engineer, the District, and/or other agency owning the affected utility.

1.04 SANITATION

- A. Toilet Facilities: Fixed or portable chemical toilets shall be provided wherever needed for the use of employees.

- B. Sanitary and Other Organic Wastes: The Contractor shall establish a regular daily collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the Contractor or organic material wastes from any other source related to the Contractor's operations shall be disposed of away from the site in a manner satisfactory to the Engineer and in accordance with all laws and regulations pertaining thereto.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01555

TEMPORARY TRAFFIC CONTROL SYSTEMS

PART 1 - GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall provide all materials, equipment, and labor necessary to furnish, place, and maintain all temporary traffic control systems, including construction and maintenance area traffic control devices and flaggers as required to perform the Work in accordance with this Section, and all other appurtenant work, complete in place, as shown on the Drawings and as specified herein.
- B. Work Specified in this Section:
 - 1. Review of proposed Work areas to determine temporary traffic control requirements.
 - 2. Verification of temporary traffic controls with the Engineer or appropriate agency prior to implementation.
 - 3. Maintenance of traffic control during the Work.
 - 4. Monitoring traffic control during the Work to determine necessary changes required to maintain adequacy.
 - 5. Maintenance of traffic control during non-work hours to maintain adequacy.
 - 6. Removal of temporary traffic control systems after completion of the Work.

1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. State of California, Department of Transportation (Caltrans) Specifications and Standards:
 - 1. Standard Specifications:
 - Section 7 Legal Relations and Responsibility
 - Section 12 Construction Area Traffic Control Devices
 - 2. Standard Plans

3. Traffic Manual, current edition
- B. Commercial Standards:
1. State of California, Division of Industrial Safety, Department of Industrial Relations:

Safety Orders of the Division of Industrial Safety, Department of Industrial Relations of the State of California, current edition

1.03 CONTRACTOR SUBMITTALS

- A. In addition to the submittal requirements of Section 01110 "Summary of Work," the Contractor shall provide the following at least 10 working days prior to excavation and shall meet with the approval of the District:
1. Specific "Traffic Control/Construction Staging Plans" indicating proposed traffic control measures during all stages of the Work. The plan shall include time periods, lane closure markings and sign locations. The plan shall be prepared by a licensed California Civil Engineer. These plans shall show the necessary signing and channelization for all affected roads.

The plans shall also include any necessary signal phasing changes. Additionally, where detours are necessary, these plans shall show specific detour routing and signing.

These plans shall be submitted for review and approval by the District and by the City of Marina in order to determine the Contractor's compliance with the requirements of this section and the Drawings.
- B. The Contractor shall be responsible for submitting separate applications for encroachment permits to the appropriate agencies for Work or traffic control within areas outside of the jurisdiction of the District and the City of Marina. The Contractor shall be responsible for compliance with all traffic control requirements determined necessary by other permitting agencies or other public authorities acting within their jurisdictions.

1.04 PRODUCTS

- A. All construction area stationary and portable sign panels, lights, barricades, and traffic control devices shall be the product of a commercial sign or safety device manufacturer conforming to the requirements of Section 12, "Construction Area Traffic Control Devices," of the Caltrans Standard

Specifications, unless otherwise specified in this Section, shown on the Drawings, and/or as directed by the Engineer.

1.05 GENERAL

- A. The Contractor shall provide all appropriate traffic control measures in accordance with this Section prior to start of construction in the public right-of-way or in any area adjacent to the street right of way where public safety is affected.
- B. The Contractor shall take all necessary precautions for the protection of the Work and the safety of its employees and the public. Traffic shall be maintained through the construction or maintenance zone in accordance with Sections 7-1.08, 7-1.09 and 12 of the Caltrans Standard Specifications and Sections 01110 "Summary of Work."
- C. Proposed traffic control plans shall be approved by the Engineer and any other public agency with jurisdiction over the roadway prior to installation.
- D. All construction area signs, lights, barricades, and traffic control devices shall be furnished, installed, maintained, and removed in conformance with the specifications of the Caltrans Traffic Manual, current edition, as published by the State of California Department of Transportation. Additional or alternate signs may only be used when specifically authorized by the Engineer.
- E. The Contractor shall station guards or flaggers and shall conform to such special safety regulations relating to traffic control as may be required by these Technical Specifications, the Engineer, or other public authorities acting within their jurisdictions. Section 12-2.02 of the Caltrans Standard Specifications is revised to provide that all flaggers and guards shall be furnished by the Contractor at its expense.
- F. The Contractor shall monitor traffic and safety conditions and maintain adequate traffic control measures during both work and non-work hours in order to maintain compliance with the requirements of this Section.
- G. The Contractor shall conform to all requirements of the current "Safety Orders of the Division of Industrial Safety, Department of Industrial Relations of the State of California."
- H. If a hazardous condition is observed and the District notifies the Contractor either directly or by telephone, the Contractor shall correct the condition immediately. If the Contractor fails to correct the hazardous condition immediately, the District reserves the right to call in a local contractor to perform the necessary work needed to improve public safety. The cost incurred shall be billed to the Contractor.

- I. All construction area signs, lights, barricades, and temporary traffic control devices shall be completely removed from the roadway when not in use. Locations and methods of storing traffic control equipment adjacent to the roadway between interrupted use shall require prior approval of the Engineer.
- J. The Contractor shall completely remove all temporary signs, striping and/or delineators and restore the pavement, as necessary, upon removal or relocation of any temporary traffic controls or detours constructed as part of the Work.
- K. When traffic is detoured to the bicycle/parking lane adjacent to the curb where street tree branches are interfering with vehicular traffic, the Contractor shall trim the trees.
- L. When the construction activity makes any detector loop at a traffic signal inoperative for a period of 72 hours or more, the Contractor shall provide video detection, or any other similar device which is not installed in the pavement prior to the start of work at his own expense. The Contractor shall provide a temporary video detection device attached to the traffic signal pole or arm which is wired to the traffic signal controller. The proposed video detection device must be approved by the Engineer.
- M. Temporary traffic control measures shall be in effect only during work hours. Normal traffic routing shall be reestablished at the end of each workday.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01560

PROTECTION OF EXISTING FACILITIES

PART 1 - GENERAL

1.01 CONTRACTOR RESPONSIBILITIES

- A. The Contractor shall protect all existing utilities and all other improvements not designated for removal and shall restore damaged or temporarily relocated utilities and improvements to a condition equal to or better than they were prior to such damage or temporary relocation, all in accordance with requirements of the Contract Documents. Both sites have existing percolation ponds which are property of the County and are essential elements to the County and local flood control. All activities by the Contractor shall be considered with respect to protection of the percolation ponds. If any issue presents itself that may impact the integrity and/or function of the percolation ponds, this shall be brought to the immediate attention of the District's Representative and shall be approved before proceeding with potentially damaging work.
- B. The Contractor shall verify the exact locations and depths of all utilities shown and the Contractor shall make exploratory excavations of all utilities that may interfere with the Work. All such exploratory excavations shall be performed as soon as practicable after award of contract and, in any event, a sufficient time in advance of construction to avoid possible delays to the Contractor's work. When such exploratory excavations show the utility location as shown to be in error, the Contractor shall immediately notify the Engineer.
- C. The number of exploratory excavations required shall be that number which is sufficient to determine the alignment and grade of the utility.
- D. In the event it is necessary to respond with District crews in lieu of the Contractor to repair damages done to any District facilities caused by the Contractor's operations or as a consequences thereof, there shall be a minimum mobilization cost fee of \$500 for administrative overhead, billing and equipment use in addition to the actual hourly overhead rate (including benefits) billed for District employees and any materials costs. The Contractor shall be obligated to pay this amount separately to the District prior to the completion of the project and retention payment. The use of District crews will be at the discretion of the District.
- E. If a hazardous condition is observed and the District notifies the Contractor either directly or by telephone, the Contractor shall correct the condition

immediately. If the Contractor fails to correct the condition immediately, the District reserves the right to call a local supplier(s) to install the necessary measures such as lights, barricade, etc. The cost involved shall be deducted from any money due (or to become due) to the Contractor.

1.02 RIGHTS-OF-WAY

- A. The Contractor shall not do any work that would affect any oil, gas, sewer, or water pipeline; any telephone, telegraph, or electric transmission line; any fence; or any other structure, nor shall the Contractor enter upon the rights-of-way involved until notified by the Engineer that the District has secured authority therefor from the proper party. After authority has been obtained, the Contractor shall give said party due notice of its intention to begin Work, and shall give said party convenient access and every facility for removing, shoring, supporting, or otherwise protecting such pipeline, transmission line, ditch, fence, or structure, and for replacing same. When two or more contracts are being executed at one time on the same or adjacent land in such manner that work on one contract may interfere with that on another, the District shall determine the sequence and order of the Work. When the territory of one contract is the necessary or convenient means of access for the execution of another contract, such privilege of access or any other reasonable privilege may be granted by the District to the Contractor so desiring, to the extent, amount, in the manner, and at the times permitted. No such decisions as to the method or time of conducting the Work or the use of territory shall be made the basis of any claim for delay or damage, except as provided for temporary suspension of the Work.

1.03 PROTECTION OF STREET OR ROADWAY MARKERS

- A. The Contractor shall not destroy, remove, or otherwise disturb any existing survey markers or other existing street or roadway markers without proper authorization. No pavement breaking or excavation shall be started until all survey or other permanent marker points that will be disturbed by the construction operations have been properly referenced for easy and accurate restoration. It shall be the Contractor's responsibility to notify the proper representatives of the time and location that work will be done. Such notification shall be sufficiently in advance of construction so that there will be no delay due to waiting for survey points to be satisfactorily referenced for restoration. All survey markers or points disturbed by the Contractor without proper authorization by the Engineer will be accurately restored by the proper representatives at the Contractor's expense after all street or roadway resurfacing has been completed.

1.04 RESTORATION OF PAVEMENT

- A. General: All paved areas including asphaltic concrete berms cut or damaged during construction shall be replaced with similar materials and of equal thickness to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the Contract Documents or in the requirements of the agency issuing the permit. All temporary and permanent pavement shall conform to the requirements of the affected pavement owner. All pavements which are subject to partial removal shall be neatly saw cut in straight lines.
- B. Temporary Resurfacing: Wherever required by the public authorities having jurisdiction, the Contractor shall place temporary surfacing promptly after backfilling and shall maintain such surfacing for the period of time fixed by said authorities before proceeding with the final restoration of improvements.
- C. Permanent Resurfacing: In order to obtain a satisfactory junction with adjacent surfaces, the Contractor shall saw cut back and trim the edge so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with adjacent undisturbed pavement.
- D. Restoration of Sidewalks or Private Driveways: Wherever sidewalks or private roads have been removed for purposes of construction, the Contractor shall place suitable temporary sidewalks or roadways promptly after backfilling and shall maintain them in satisfactory condition for the period of time fixed by the authorities having jurisdiction over the affected portions before proceeding with the final restoration or, if no such period of times is so fixed, the Contractor shall maintain said temporary sidewalks or roadways until the final restoration thereof has been made.

1.05 EXISTING UTILITIES AND IMPROVEMENTS

- A. General: The Contractor shall protect all Underground Utilities and other improvements which may be impaired during construction operations. It shall be the Contractor's responsibility to ascertain the actual location of all existing utilities and other improvements that will be encountered in its construction operations, and to see that such utilities or other improvements are adequately protected from damage due to such operations. The Contractor shall take all possible precautions for the protection of unforeseen utility lines to provide for uninterrupted service and to provide such special protection as may be necessary.

- B. Utilities to be Moved: In case it shall be necessary to move the property of any public utility or franchise holder, such utility company or franchise holder will, upon request of the Contractor, be notified by the District to move such property within a specified reasonable time. When utility lines that are to be removed are encountered within the area of operations, the Contractor shall notify the Engineer a sufficient time in advance for the necessary measures to be taken to prevent interruption of service.
- C. Where the proper completion of the Work requires the temporary or permanent removal and/or relocation of an existing utility or other improvement which is shown the Contractor shall remove and, without unnecessary delay, temporarily replace or relocate such utility or the facility. In all cases of such temporary removal or relocation, restoration to former location shall be accomplished by the Contractor in a manner that will restore or replace the utility or improvement as nearly as possible to its former locations and to as good or better condition than found prior to removal.
- D. District's Right of Access: The right is reserved to the District and to the owners of public utilities and franchises to enter at any time upon any public street, alley, right-of-way, or easement for the purpose of making changes in their property made necessary by the Work of this Contract.
- E. Underground Utilities Shown or Indicated: Existing utility lines that are shown or the locations of which are made known to the Contractor prior to excavation and that are to be retained, and all utility lines that are constructed during excavation operations shall be protected from damage during excavation and backfilling and, if damaged, shall be immediately repaired by the Contractor.
- F. Underground Utilities Not Shown or Indicated: In the event that the Contractor damages any existing utility lines that are not shown or the locations of which are not made known to the Contractor prior to excavation, a written report thereof shall be made immediately to the Engineer. If directed by the Engineer, repairs shall be made by the Contractor under the provisions for changes and extra work contained in the General Conditions.
- G. All costs of repairing damage not due to failure of the Contractor to exercise reasonable care, and removing or relocating such utility facilities not shown in the Contract Documents and for equipment on the project which was actually working on that portion of the work which was interrupted or idled by removal or relocation of such utility facilities, and which was necessarily idled during such work will be paid for as extra work in accordance with the provisions in the General Conditions.

- H. Approval of Repairs: All repairs to a damaged improvement are subject to inspection and approval by an authorized representative of the improvement owner before being concealed by backfill or other work.
- I. Maintaining in Service: All oil and gasoline pipelines, power, and telephone or other communication cable ducts, gas and water mains, irrigation lines, sewer lines, storm drain lines, poles, and overhead power and communication wires and cables encountered along the line of the Work shall remain continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the Engineer are made with the owner of said pipelines, duct, main, irrigation line, sewer, storm drain, pole, or wire or cable. The Contractor shall be responsible for and shall repair all damage due to its operations, and the provisions of this Section shall not be abated even in the event such damage occurs after backfilling or is not discovered until after completion of the backfilling.
- J. Monuments: If monuments are disturbed by the Contractor, the Contractor shall hire a licensed surveyor to prepare and process a record of survey through the City or the County (if the monuments are located in County roads) to reset the monuments. The cost of preparing the necessary survey documents, processing the survey documents, and resetting the monuments shall be paid for by the Contractor. This work shall be completed **prior** to project acceptance and additional monies will be withheld for this work prior to the release of retention.
- K. Traffic Detectors (Loops) and Traffic Signals: In the event a loop wire is disturbed or a signal conduit is damaged, the Contractor shall notify the District and the City of Marina immediately. It shall be the Contractor's responsibility to replace damaged loops and street signal wires within 24 hours. Traffic signal conduit and wiring shall be repaired immediately by the Contractor. All repairs of the traffic signals and loops by the Contractor shall be at the Contractor's sole expense.

1.06 TREES WITHIN STREET RIGHTS-OF-WAY AND PROJECT LIMITS

- A. General: The Contractor shall exercise all necessary precautions so as not to damage or destroy any trees or shrubs, including those lying within street rights-of-way and project limits, and shall not trim or remove any trees unless such trees have been approved for trimming or removal by the District or other jurisdictional agency. All existing trees and shrubs which are damaged during construction shall be trimmed or replaced by the Contractor or a certified tree company hired by the Contractor to the satisfaction of the District and/or agency. Tree trimming and replacement shall be accomplished in accordance with the following paragraphs.

- B. Trimming: The natural shape and form of the tree shall be preserved and enhanced; no stubs or splits or torn branches left; no topping or drop crotching; and clean cuts shall be made close to the trunk or large branches.

- C. Replacement: The Contractor shall immediately notify the District and/or other jurisdictional agency if any tree is damaged by the Contractor's operations. If, in the opinion of the District or said other agency, the damage is such that replacement is necessary, the Contractor shall replace the tree at its own expense. The tree shall be of a like size and variety as the tree damaged, or, if of a smaller size, the Contractor shall pay to the owner of said tree a compensatory payment acceptable to the tree owner, subject to the approval of the District or other jurisdictional agency. The size of the trees shall be not less than 1-inch diameter nor less than 6 feet in height. Fines will be assessed against the Contractor for trees removed without the District's prior written approval. The minimum amount of fine or restitution to the City will be the replacement of the tree removed, with one of equal or greater size and maturity and as approved by the District. Larger fines may be assessed against the Contractor depending upon the circumstances and type of tree removed.

1.07 NOTIFICATION BY THE CONTRACTOR

- A. Prior to any excavation in the vicinity of any existing underground facilities, including all water, sewer, storm drain, gas, petroleum products, or other pipelines; all buried electric power, communications, or television cables; all traffic signal and street lighting facilities; and all roadway and state highway rights-of-way the Contractor shall notify the Underground Service Alert agency and the respective authorities representing the owners or agencies responsible for such underground facilities not less than 48 hours prior to excavation so that a representative of said owners or agencies can be present during such work if they so desire.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01720

FIELD ENGINEERING

PART 1 - GENERAL

- A. The Contractor shall provide field engineering for the Work.
 - 1. The Contractor shall lay out and install all Work to lines and grades in accordance with Contract Documents.

1.01 BASE LINES AND GRADES

- A. General: The Contractor shall establish sufficient temporary horizontal and vertical control points prior to the beginning of construction to enable layout of the Work.
- B. Preservation of Stakes and Marks: It shall be the responsibility of the Contractor to maintain and preserve all stakes and other marks established until authorized to remove them; and, if such stakes or other marks are destroyed by the Contractor, and subcontractors, or any other persons other than the Engineer or the District, or through the Contractor's negligence, prior to their authorized removal, they may be replaced at the discretion of the Engineer, and the expense of such replacement shall be borne by the Contractor and will be deducted from any amounts of money due or to become due to the Contractor. The Engineer may require the Work be suspended at any time when location or limit marks established by the Contractor are not reasonably adequate to permit convenient checking of the Work by the Engineer.
- C. Datum: The plane of reference for elevations used in the Contract Documents is shown on the plans.
- D. Baseline: A monumented survey line will be provided by the Engineer as a base line for horizontal control on the project area.
- E. Benchmarks: Temporary survey control data is shown on the Drawings
- F. Horizontal and Vertical Control: From the base line and temporary bench marks described herein and as shown on the Drawings, the Contractor shall complete the layout of the Work and shall be responsible for all measurements that may be required for execution of the Work to the location and limit marks prescribed in the Contract Documents, subject to such modifications as the Engineer may require to meet changed or unforeseen conditions, or as a result of necessary modifications to the Contract Work.

- G. Contractor's Layout: The Contractor shall furnish at its own expense all such stakes, templates, platforms, ranges, gages, equipment, tools, materials, and all labor as required in laying out any and all parts of the Work from the base line and bench marks established by the Engineer.

1.02 RECORDS

- A. The Contractor shall maintain a complete, accurate log of all control and survey work as it progresses.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01770

PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 FINAL CLEANUP

- A. The Contractor shall promptly remove all rubbish, debris, unused materials, concrete forms, construction equipment, and temporary structures and facilities used during construction. Final acceptance of the Work by the District will be withheld until the Contractor has satisfactorily complied with the foregoing requirements for final cleanup of the project site.

1.02 CLOSEOUT TIMETABLE

- A. The Contractor shall establish dates for equipment testing, acceptance periods, (as required under the Contract). Such dates shall be established not less than two weeks prior to beginning any of the foregoing items, to allow the District, the Engineer, and their authorized representatives and consultants sufficient time to schedule attendance at such activities.
- B. All temporary buildings, including field offices, storage buildings, and sheds shall be removed from the project site 7 days after completion of the Work. All temporary services such as water, power, utilities, service contracts, pager contracts, telephones, and other temporary services shall remain in service for 7 days following execution of a Notice of Completion of the Work by the District, and shall be discontinued within 7 days after said execution of a Notice of Completion of the Work.

1.03 FINAL SUBMITTALS

- A. The Contractor, prior to requesting its final progress payment, shall submit the following items to the Engineer:
 - 1. Written guarantees or warranties
 - 2. Completed final Record Drawings
 - 3. Certificates of inspection and acceptance by local governing agencies having jurisdiction
 - 4. Releases executed by property owners adjacent to the project site attesting that the Contractor has restored any damage done to their property during construction.

5. Releases from all parties who are entitled to claims against the subject project, property, or improvement pursuant to the provisions of law.

1.04 COMPLETION OF THE WORK

- A. The date of substantial completion of the Project shall be the date when the construction is sufficiently completed, in accordance with the Contract Documents, as modified by any change orders agreed to by the parties, so that the District can occupy or utilize the project for the use for which it was intended, and the legislative body of the District has accepted the Project as evidenced by execution and recording of a Notice of Completion.

1.05 REMAINING PUNCH LIST ITEMS

- A. Upon attaining substantial completion and upon acceptance of the Work by the District, by agreement between the parties some small remaining punch list items may remain to be completed by the Contractor.
- B. As provided in the General Conditions, the District shall have the right to retain an additional amount of money from the final progress payment due the Contractor, equal to 150% of the Engineer's estimate of the value of such uncompleted punch list items.
- C. Failure of the Contractor to complete or correct all such outstanding punch list work to the satisfaction of the Engineer shall constitute a waiver by the Contractor of all rights to any and all claims it may have to all monies withheld by the District under the Contract to cover the value of such uncompleted or uncorrected items.

1.06 MAINTENANCE, CORRECTION AND REPAIR PERIOD

- A. The Contractor shall comply with the correction and repair requirements contained in the General Conditions.
- B. Replacement of earth fill or backfill, where it has settled below the required finish elevations, shall be considered as a part of such required repair work, and any repair or resurfacing constructed by the Contractor which becomes necessary by reason of such settlement shall likewise be considered as a part of such required repair work unless the Contractor shall have obtained a statement in writing from the affected private owner or public agency releasing the District from further responsibility and liability in connection with such repair or resurfacing.

- C. The Contractor shall make all repairs and replacements promptly upon receipt of written order from the District. If the Contractor fails to make such repairs or replacements promptly, the District reserves the right to do the work or to have the work done by others and the Contractor and its Surety shall be liable to the District for the cost thereof.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 02001
SITE CONDITIONS

PART 1 - GENERAL

1.01 INFORMATION ON SITE CONDITIONS

- A. All information obtained by the District regarding site conditions, surface topography, subsurface information, groundwater elevations, existing construction of site facilities, and existing underground utilities and similar data will be available to prospective Bidders upon request and at the office of the Engineer, prior to bid opening.
- B. No geotechnical investigations were made for the purpose of this project design.
- C. Information derived from inspection of logs of test borings, pits, topographic maps, geotechnical reports, or from Plans showing locations of utilities and structures will not in any way relieve the Contractor from any risk, or from properly examining the site and making such additional investigations as he may elect, or from properly fulfilling all the terms of the Contract Documents.

1.02 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor shall satisfy himself as to the nature and location of the Work, the general and local conditions, particularly those bearing upon availability of transportation, disposal, limited access to site, handling and storage of materials, availability of labor, water, electric power, roads, and uncertainties of weather, or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment facilities needed preliminary to and during the prosecution of the Work and all other matters which can in any way affect the Work or the cost thereof under this Contract.
- B. The Contractor shall further satisfy himself as to the character, quality, and quantity of surface and subsurface materials to be encountered during the course of execution of the work by inspecting the site as well as, any exploratory work performed by the Engineer, and information presented by the Plans and Specifications made a part of this Contract. Any failure by the Contractor to acquaint himself with all available information will not relieve him from responsibility for properly estimating the difficulty or cost of successfully performing the Work.

- C. The Contractor shall anticipate underground obstructions such as utility lines, concrete, water table, soil conditions and debris. No extra payment will be allowed for the removal, replacement, repair or possible increased cost caused by underground obstructions. Any such lines or obstructions indicated on the map show only the approximate location and must be verified in the field by the Contractor. The Engineer will endeavor to familiarize the Contractor with all known underground obstructions, but this will not relieve the Contractor from full responsibility in anticipating and locating all underground obstructions.
- D. The Contractor shall note that some of the existing roads and streets are residential in character and that heavy truck and equipment operations may cause roadway damage in excess of normal usage. Damage caused to the streets, curbs, gutters, or bike path by the Contractor's operations shall be repaired to a condition equal or better than the original condition at the Contractor's expense.

1.03 ADDITIONAL INFORMATION

- A. Prior to bidding, Bidders may make their own subsurface investigations subject to time schedules and arrangements approved in advance by the District. Before any subsurface test holes are excavated, obtain necessary permits to perform such work.
- B. The Owner has the original pump station drawings available for examination.

1.04 SURFACE FACILITIES

- A. The Contractor is advised that the Plans were prepared based on available information and, therefore, all existing surface facilities may not be shown on the Plans. It is the Contractor's responsibility to acquaint himself with existing site conditions per this Section and anticipate those surface facilities which are typically encountered (fences, signs, mailboxes, sidewalks, driveways, ditches, AC pavement, AC dikes, curbing, power poles, overhead lines, landscaping, irrigation, etc.) and will affect the Work. The Contractor shall provide adequate security to protect the public and Work. No extra payment will be made to the Contractor for the repair, removal and replacement of such facilities. Full payment for this work shall be as included in the various bid items.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 02003

EXISTING UTILITIES AND UNDERGROUND STRUCTURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Refer to plans for the locations of utilities and underground structures.
- B. Contractor's responsibilities.

1.02 CALIFORNIA ADMINISTRATIVE CODE

- A. Section 1540(a)1 of Construction Safety Orders (Title 8) California Administrative Code, section 1540 states:

(1) "Prior to opening and excavation, effort shall be made to determine whether underground installations; i.e., sewer, water, gas, electric lines, storm drain, cable TV, telephone, and fiber optics, will be encountered and, if so, where such underground installations are located. When the excavation approaches the approximate location of such an installation, the exact location shall be determined by careful probing or hand digging; and, when it is uncovered, adequate protection shall be provided for the existing installation. All known owners of underground facilities in the area concerned shall be advised of proposed work at least 48 hours prior to the start of actual excavation."

- B. The approximate location of public utilities and underground structures was based on information provided by the utility owners. However, in accordance with California's Administrative Code, section 1540, Contractor shall make the effort to determine the exact location of underground installations.

1.03 PUBLIC UTILITIES AFFECTED

- A. Electrical: Pacific Gas & Electric Company. It should be noted that where overhead service to a structure, known to receive service, does not have overhead service, then underground service shall be assumed to exist. For underground utility location call Underground Service Alert (USA) at (800) 227-2600.
- B. Gas: Pacific Gas & Electric Company has jurisdiction over gas lines.
- C. Water Service: Marina Coast Water District has jurisdiction over water usage.

- D. Drainage: City of Marina has jurisdiction over drainage in the area.
- E. Roads: The City of Marina has jurisdiction over roads in the area.
- F. Cable Television: Comcast Cable has jurisdiction over cable in the area. It should be noted that where overhead service to a structure that has service does not exist then underground service shall be assumed to exist. For underground utility location, call USA at (800) 227-2600.
- G. Telephone: SBC has jurisdiction over telephone service in the area. It should be noted that where overhead service to a structure, known to receive service, does not have overhead service, then underground service shall be assumed to exist. For assistance with location of underground telephone facilities, call USA at (800) 227-2600.
- H. Electrical: City of Marina for traffic signal conduit/conductors and street lights.

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 CONTRACTOR RESPONSIBILITY

- A. The Contractor shall anticipate water, sewer, storm drain, electrical, gas, cable TV, and telephone services. It may be expected that there will be variation in location from that as shown on the Plans to the actual location. Actual location can best be determined in the field after pre-marking by the various utilities affected.
- B. It should be understood that the various utilities are indicated on the Plans to show only the approximate location and must be verified in the field by the Contractor. The various utility agencies will cooperate with the Contractor to endeavor to familiarize him with all known underground utility obstructions, but this will not relieve the Contractor from full responsibility in anticipating and locating their actual existence. No extra payment will be allowed for the removal, replacement, repair, or possible increased cost caused by inadvertent or planned interception and breaking of underground obstructions which may exist.
- C. The Contractor, in conjunction with the affected utility company(s), shall locate and establish the horizontal and vertical location of all utilities shown on the Plans and marked in the field. This may be done on an area by area basis, but shall be accomplished at least 5 working days in advance of the date of construction within such area and prior to any fabrication. Any

discrepancies (horizontal and/or vertical) between the location of a utility found by the potholing operation than that shown on the Plans shall be brought to the Engineer's attention immediately. The Engineer shall determine if field revisions are necessary, and if so, make the revision. In the event utility(s) relocation is determined necessary, the utility company involved will be responsible for relocation or the general contractor will perform the relocation as extra work.

- D. Damaged traffic loops shall be replaced and functioning within 5 days of their destruction.

END OF SECTION

SECTION 02145

BYPASSING WASTEWATER

PART 1 - GENERAL

1.1 SYSTEM DESCRIPTION

A. Performance Requirements:

1. It is essential to the operation of the existing sewage system that there be no interruption in the flow of sewage throughout the duration of the Project. Provide, maintain, and operate all temporary facilities such as dams, plugs, flow-through plugs, pumping equipment (both primary and backup units as required), electrical control conduits, and all necessary power to intercept the sewage flow before it reaches the point where it would interfere with the Work, carry it past the Work, and return it to the existing sewer downstream of the Work.
2. Design, install, and operate the temporary pumping systems where required.
3. Convey the sewage safely past this Work area. Do not stop or impede the main flows under any circumstances.
4. Maintain sewage flow around the Work area in a manner that will not cause surcharging of sewers, damage to sewers, and that will protect public and private property from damage and flooding, including the routing of sewage overflow in the event of failure of any bypass system.
5. Protect water resources, wetlands, and other natural resources.
6. Qualified personnel supervising bypass pumping operations 24 hours per day.

B. Design Requirements (Pump Station):

1. Provide plugs, pumps of adequate size to handle peak flow, and/or temporary discharge piping, to ensure that the total flow into the pump station can be safely diverted around the station to be replaced. Bypass pumping systems will be required to be operated and supervised by qualified personnel 24 hours per day, 7 days per week, including holidays during bypass pumping operations.

2. Provide onsite portable lights for emergency use only.
3. Provide standby generation facilities for emergency use if pumps are equipped with electric motors.

C. Design Requirements:

1. Provide plugs, pumps and sewage haulers of adequate size and all other equipment needed to safely collect peak flow before it enters into the wet well that is to be rehabilitated or overflow to the ground. Pumping and hauling systems will be required to be operated and supervised by qualified personnel 24 hours per day, 7 days per week, including holidays during the collection and discharge operations.
2. The temporary pumping bypass should have sufficient pumping capacity to convey the wastewater under the existing station's peak design flow. The approximate design operation point for the existing station is as follows: **1,000 gpm @ 70'TDH**
3. Solids removed by sewage haulers can be taken to a local landfill.

1.2 SUBMITTALS

- A. Detailed plans and descriptions outlining complete flow bypass pumping system for each of the four pump stations. Plans shall show system components, layout, piping, connection details, power plan, controls, and details on equipment specifications (pump rating, pipe size and material, etc). Plans shall include an emergency response plan to be followed in the event of a failure of the systems. All plans shall be submitted to the Engineer at least 10 working days prior to required operation of the bypass systems.
- B. Where pumping is required, submit complete information on generation system.
- C. Where standby generators are required, submit complete information on generation system. All generators shall be rated for low noise rate compliance in residential neighborhoods. Decibels of generators and pump shall not exceed 65 dBA at 50 feet. The Contractor shall submit proposed generator and dBA rating to the Engineer for approval prior to use.

1.3 QUALITY ASSURANCE

- A. The bypass system shall be designed and operated so that no sewage overflow or spills occur.
- B. Should spills occur, the Contractor will be completely responsible for any overflow or spillage of raw sewage due to failure of any bypass system.
- C. Contractor to pay any fines or costs associated with such spillages.
- D. Contractor to be responsible for any cleanup or restoration resulting from such spillages.

PART 2 - PRODUCTS

2.1 PUMP SYSTEMS

- A. Pumps may be gas, electric, or diesel powered.
- B. Pumps may be end suction or submersible.
- C. Bypass piping shall be rubber gasketed or butt-fused HDPE, with no visible leaks under operating conditions.

PART 3 - EXECUTION

3.1 GENERAL

- A. If pumping is required across a street or driveway that cannot be closed to traffic, the discharge piping shall be:
 - 1. Temporarily buried, backfilled, and paved.
 - 2. Collapsible conduit adequate to allow crossing by traffic may be used only during work hours when the contractor is on the project site.
- B. Bypass pumping and sewage hauling shall be monitored at all times by a competent person familiar with the pumping equipment.
- C. New pumps and pipelines may be utilized to convey sewage prior to final acceptance, provided all pipe and structures downstream have been tested, cleaned, inspected, and accepted.

- D. Contractor shall conform to all safety provisions pertaining to confined space entry when entering any manhole.
- E. Contractor shall notify Engineer 48 hours prior to commencing bypass system operation.
- F. Before final acceptance of the Work on the project, all temporary connections, pumping and piping installed by the Contractor shall be entirely removed, and all affected improvements shall be restored to their original condition, or better, to the satisfaction of Engineer, the District, and/or other agency owning the affected utility.

END OF SECTION

SECTION 02220

DEMOLITION AND ABANDONMENT

PART 1 - GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall furnish all tools, equipment, materials, and supplies and shall perform all labor as required for the demolition, abandonment, or removal of structures and equipment as indicated on the plans and as specified herein.
- B. The work of this Section shall include, but shall not be limited to the following items:
 - 1. Demolition of concrete, pumps, valves, pipeline, concrete box, wet well, electrical equipment, instrumentation, wiring, and other features as required to install new pumps, pipes, wet well, valve vault, and appurtenant systems.
 - 2. Existing pumps to be salvaged. They shall be removed from the existing wet well with care, protected, and reinstalled in the new wet well per the Contract Drawings and Specifications.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300 - Special Project Constraints
- B. Division 1 - General Requirements

1.03 DEMOLITION/ABANDONMENT COORDINATION

- A. The contractor shall carefully coordinate the extent of the work in areas where existing utilities shall be reconnected to new facilities, where existing facilities shall remain operational and where vegetation and curb and gutters shall be restored.
- B. While work is being performed, the Contractor shall provide adequate access for routine operation and maintenance. The Contractor shall erect and maintain fences, warning signs, barricades, and other devices as required for the protection of the Contractor's employees and the public around pipeline and structures. The Contractor shall remove all such protection when the demolition/abandonment operations are completed, or as work progresses, or when directed by the Engineer.

- C. All demolition and disposal shall be in accordance with hazardous materials procedures for removal of ACM and ACCM lead-based materials.
- D. The Contractor shall coordinate all work with the Engineer.

1.04 REPAIR OF DAMAGE

- A. Any damage to remaining street work improvements, utility poles, building elements to remain, other existing facilities to remain, and private property, as caused by the Contractor's operations shall be repaired at the Contractor's expense.
- B. Damaged items shall be repaired or replaced with new materials as required to restore damaged items or surfaces to a condition equal to and matching that existing prior to damage or start of work of this contract.

1.05 PROTECTION OF EXISTING FACILITIES

- A. Before beginning any cutting, trenching, demolition or abandonment work, the Contractor shall carefully inspect the existing facilities to determine the extent of the work. The Contractor shall take all necessary precautions to prevent damage to existing facilities which are to remain in place and in operation. Special attention is required for the adjacent percolation ponds, which must be protected and the contractor shall prevent any construction debris from entering the pond. The Contractor shall be responsible for any damages to existing facilities, which are caused by the operations of the Contractor. Damages to such facilities shall be repaired or replaced to existing condition at no additional cost to the District. The Contractor shall carefully coordinate the work of this Section with all other work and shall provide shoring, bracing, and supports, as required. The Contractor shall insure that structural elements are not overloaded and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under any part of this Contract. The Contractor shall remove all temporary protection when the Work is complete or when so authorized by the Engineer.
- B. The Contractor shall carefully consider all bearing loads and capacities for placement of equipment and material.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 02250

SHORING AND TRENCH SAFETY

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Shoring required for general safety, worker protection, and protection of adjacent property from the hazards of caving ground.
- B. Shoring for trench excavations.
- C. Shoring for structural excavations.
- D. Contractor's responsibilities.
- E. Contractor's trench safety plan.
- F. Contractor's supervisor.

1.02 CONTRACTOR'S RESPONSIBILITIES FOR SAFETY

- A. 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.
- B. Safety provisions shall conform to U.S. Department of Labor (OSHA), the California Occupational Safety and Health Act, 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 Specifications.
- C. Contractor is advised that Part 1926 of 29 CFR, subpart P, has been revised. This regulation governs excavations, trenching and protective systems, sloping, benching, wood, and aluminum shoring for various types of soils, and depths of excavations. The Contractor shall follow these regulations (including the latest revisions) for this project.
- D. Where any of these are in conflict, the more stringent requirement shall be followed.

1.03 PERMIT

- A. For trenches or excavations of depth five feet or deeper, the Contractor shall obtain from the State Division of Industrial Safety a permit for such excavation; submit a copy of the permit to the Engineer, prior to initiating any work requiring said permit.

1.04 CONTRACTOR SUBMITTALS

- A. The Contractor's attention is directed to the provisions for "Shoring and Bracing Drawings" in Section 6705 of the California Labor Code. The Contractor, prior to beginning any trench or structure excavation 5 feet deep or over, shall submit to the Engineer for review for compliance with Section 6705 the Contractor's detailed plan showing design of all shoring, bracing, sloping of the sides of excavation, or other provisions for worker protection against the hazard of caving ground during the excavation of such trenches or structure excavation. If such plan varies from the shoring system standards established in the Construction Safety Orders of the State of California, such alternative system plans shall be prepared, stamped and signed by a civil or structural engineer licensed in the State of California at the Contractor's expense.
- B. **Certificates of Compliance:** Certificates of Compliance shall be provided for all products and materials proposed to be used under this Section.
- C. For all materials that are not pre-approved by the District the Contractor shall designate the source and/or submit samples of all materials in advance of their use for required testing and Engineer's approval. All testing costs shall be at the Contractor's expense.

1.05 SAFETY ORDERS

- A. The Contractor shall have at the work site, copies or suitable extracts of the Construction Safety Orders of Cal-OSHA, and Part 1926 of 29 CFR, subpart P.
- B. All work shall comply with the provisions of these and all other applicable laws, ordinances and regulations.

1.06 CONTRACTOR'S SUPERVISOR

- A. The Contractor shall appoint a qualified supervisory employee who shall be responsible to determine the sloping or shoring system which shall be used depending on local soil type, water table, stratification, depth, etc.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 02315

EXCAVATION AND BACKFILL

PART 1 - GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall provide all materials, equipment, and labor necessary to perform and complete all utility earthwork as shown on the Drawings and as specified herein.
- B. The Work of this Section includes all earthwork required for construction of the project. Such earthwork shall include, but may not necessarily be limited to, the loosening, removing, loading, transporting, depositing, and compacting in its final location of all materials wet and dry, as required for the purposes of completing the Work, which shall include, but not necessarily be limited to, the furnishing, placing, and removing of sheeting, shoring and bracing necessary to safely support the sides of all excavations; all pumping, ditching, draining and other required measures for the removal or exclusion of water from the excavation; the supporting of structures above and below the ground; all backfilling around structures and all backfilling of trenches and pits; the disposal of excess excavated materials; borrow of materials to make up deficiencies for fills; and all other incidental earthwork.
- C. Hazardous materials shall be handled in accordance with all regulatory agency requirements and as specified in the Contract Documents.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02220 Demolition and Abandonment.
- B. Section 03300 Cast-in-Place Concrete
- C. Division 1 General Requirements
- D. Division 2 & 15 Sections as applicable.

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. State Codes:

California Labor Code.

Construction Safety Orders of the State of California.

B. State of California (Caltrans) Standards:

1. Standard Specifications:

Section 25	Aggregate Subbases.
Section 26	Aggregate Bases.
Section 68	Subsurface Drains.
Section 88	Engineering Fabrics

C. Commercial Standards:

ASTM C12	Installing Vitrified Clay Pipelines.
ASTM D 422	Test Method for Particle-Size Analysis of Soils.
ASTM D 1556	Test Method for Density of Soil in Place by the Sand-Cone Method.
ASTM D 1557	Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb (4.54-kg) Rammer and 18-in. (457-mm) Drop.
ASTM D 2419	Method for Sand Equivalent Value of Soils and Fine Aggregate.
ASTM D 2922	Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
ASTM D 3017	Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
ASTM D 3776	Test Methods for Mass per Unit Area (Weight) of Woven Fabric.
ASTM D 3786	Method of Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics: Diaphragm Bursting Strength Tester Method.
ASTM D 4253	Test Methods for Maximum Index Density of Soils Using a Vibratory Table.

ASTM D 4254	Test Methods for Minimum Index Density of Soils and Calculation of Relative Density.
ASTM D 4318	Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
ASTM D 4491	Test Methods for Water Permeability of Geotextiles by Permittivity.
ASTM D 4632	Test Method for Grab Breaking Load and Elongation of Geotextiles.
ASTM D 4751	Test Method for Determining the Apparent Opening Size of a Geotextile.
OSHA	Occupational Safety and Health Administration.

1.04 CONTRACTOR SUBMITTALS

- A. The Contractor's attention is directed to the provisions for "Shoring and Bracing Drawings" in Section 6705 of the California Labor Code. The Contractor, prior to beginning any trench or structure excavation 5 feet deep or over, shall submit to the Engineer for review for compliance with Section 6705 the Contractor's detailed plan showing design of all shoring, bracing, sloping of the sides of excavation, or other provisions for worker protection against the hazard of caving ground during the excavation of such trenches or structure excavation. If such plan varies from the shoring system standards established in the Construction Safety Orders of the State of California, such alternative system plans shall be prepared, stamped and signed by a civil or structural engineer licensed in the State of California at the Contractor's expense.
- B. **Certificates of Compliance:** Certificates of Compliance shall be provided for all products and materials proposed to be used under this Section.
- C. For all materials that are not pre-approved by the District the Contractor shall designate the source and/or submit samples of all materials in advance of their use for required testing and Engineer's approval. All testing costs shall be at the Contractor's expense.

PART 2 – PRODUCTS

2.01 MCWD STANDARD SPECIFICATION

- A. The trenching, backfilling, and compacting materials and execution for this project are specified in accordance with Marina Coast Water District

Standard Specifications, Section 02223 (August 2005, or the latest edition), and as described in the Drawings.

2.02 FILTER FABRIC

- A. Filter fabric shall be non-woven synthetic fabric, shall be permeable, not act as a wicking agent, be inert to commonly encountered chemicals, be rot-proof, be resistant to ultra-violet light, and shall conform to the physical properties given in the table below.
- B. Filter fabric shall be Mirafi 160N, Amoco ProPex 4506. or equal.
- C. All geotextile fabric seams should be overlapped a minimum of 12 inches.
- D. Geotextile fabric characteristics.

PROPERTY	TEST VALUE	TEST METHOD
Weight	5.4 oz/yd ²	ASTM D5261
Grab tensile strength	150 lb. (min)	ASTM D4632
Elongation at break	50% (max)	ASTM D4632
Puncture strength	80 lb (min)	ASTM D4833
Burst strength	300 psi (min)	ASTM D3786
Apparent opening size	#70 (max)	ASTM D4751
Permittivity	1.0 sec ⁻¹	ASTM D4491
UV Resistance	70% (min)	ASTM D4355

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 03050

BASIC CONCRETE MATERIALS AND METHODS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Formwork.
 - 2. Reinforcement.
 - 3. Accessories.
 - 4. Cast-in place concrete.
 - 5. Finishing and curing.

1.02 SUBMITTALS

- A. Shop Drawings: Indicate pertinent dimensioning, form materials. Indicate reinforcement sizes, spacings, locations, and quantities, bending and cutting schedules, supporting and spacing devices.
- B. Product Data: Indicate admixtures.
- C. Design Data: Submit mix designs.

1.03 QUALITY ASSURANCE

- A. Construct and erect concrete formwork in accordance with ACI 301.
- B. Perform concrete reinforcing work in accordance with ACI 301 and the CRS1 – Manual of Standard Practice.
- C. Perform cast-in-place concrete work in accordance with ACI 301.
- D. Perform Work in accordance with State of California Public Work's standard.
- E. Maintain one copy of each document on site.
- F. Design Work under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of California.

PART 2 - PRODUCTS

2.01 FORM MATERIALS AND ACCESSORIES

- A. Form Materials: At discretion of Contractor.

- B. Form Release Agent: Colorless mineral oil not capable of staining concrete or impairing natural bonding characteristics of coating intended for use on concrete.

2.02 REINFORCEMENT MATERIALS

- A. Reinforcing Steel: ASTM A615/A615M, 60-ksi-yield grade; deformed billet steel bars.
- B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for support of reinforcing; plastic tipped or non-corroding for supports in slabs forming finished ceilings or where supports are exposed to weather.
- C. Fabricate concrete reinforcing in accordance with CRS1 – Manual of Practice.

2.03 CONCRETE MATERIALS

- A. Cement: ASTM C150, Normal-Type II, Portland type.
- B. Fine and Coarse Aggregates: ASTM C33.
- C. Water: Clean and not detrimental to concrete.
- D. Air Entrainment Admixture: ASTM C260.

2.04 CONCRETE MIX

- A. Mix and deliver concrete in accordance with ASTM C94, Option A, except as otherwise provided in ACI 301.
- B. Furnish concrete of the strength in Section 03300 Cast-In-Place Concrete.

PART 3 - EXECUTION

3.01 FORMWORK ERECTION

- A. Erect formwork, shoring and bracing to achieve design requirements.
- B. Provide bracing to ensure stability of formwork.
- C. Form external corners of slabs with 1-inch chamfer.
- D. Apply form release agent to formwork prior to placing form accessories and reinforcement.
- E. Clean forms as erection proceeds, to remove foreign matter.

3.02 INSERTS, EMBEDDED COMPONENTS, AND OPENINGS

- A. Provide formed openings where required for work to be embedded in and passing through concrete members.
- B. Coordinate work of other sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.
- C. Install concrete accessories straight, level, and plumb.

3.03 REINFORCEMENT PLACEMENT

- A. Place reinforcement, supported and secured against displacement.
- B. Ensure reinforcing is clean, free of loose scale, dirt, or other foreign coatings.

3.04 PLACING CONCRETE

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent.

3.05 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
- B. Remove formwork progressively and in accordance with code requirements.

3.06 FLOOR FINISHING

- A. Finish concrete slab surfaces in accordance with ACI 301.
- B. Uniformly spread, screed, and float concrete.
- C. Maintain surface flatness, with maximum variation of 1/8-inch in 10 ft.

3.07 CURING

- A. Immediately after placement, protect concrete from premature drying.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete for not less than 7 days.

3.08 FORMED SURFACES

- A. Provide concrete surfaces to be left exposed with smooth rubbed finish.

3.09 FIELD QUALITY CONTROL

- A. Three (3) Concrete Test Cylinders: Taken for every 100 or less cubic yards of concrete placed.
- B. One (1) Additional Test Cylinder: Taken during cold weather concreting, and cured on job site under same conditions as concrete incorporated into the Work.
- C. One (1) Slump Test: Taken for each set of test cylinders taken.

3.010 DEFECTIVE CONCRETE

- A. Modify or replace concrete not conforming to required lines, details and elevations, as directed by the Engineer.

END OF SECTION

SECTION 03200
CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Reinforcing bars.
 - 2. Welded wire fabric.
 - 3. Reinforcement accessories.

1.02 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate bar sizes, spacings, locations, and quantities of reinforcing steel and welded wire fabric, bending and cutting schedules, and supporting and spacing devices.
- C. Certificates: Submit AWS qualification certificate for welders employed on the Work.
- D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.
- E. Submit certified copies of mill test report of reinforcement materials analysis.

1.03 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301.
- B. Maintain one copy of document on site.

PART 2 PRODUCTS

2.01 REINFORCEMENT

- A. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade; deformed billet steel bars.

2.02 FABRICATION

- A. Fabricate concrete reinforcement in accordance with CRSI Manual of Practice.
- B. Locate reinforcement splices not indicated on Drawings, at point of minimum stress.

PART 3 EXECUTION

3.01 PLACEMENT

- A. Place, support and secure reinforcement against displacement. Do not deviate from required position.
- B. Do not displace or damage vapor retarder.
- C. Accommodate placement of formed openings.
- D. Maintain concrete cover around reinforcement as follows:

Item	Coverage
Supported Slabs and Joists	3/4 inch
Footings and Concrete Formed Against Earth	3 inches

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes cast-in-place concrete for the following:
 - 1. Supported Slabs
 - 2. Slabs on Grade
 - 3. Wet Well Base

1.02 REFERENCES

- A. American Concrete Institute
 - 1. ACI 301 – Specifications for Structural Concrete.
 - 2. ACI 305 – Hot Weather Concreting.
 - 3. ACI 318 – Building Code Requirements for Structural Concrete.
- B. American Society for Testing and Materials:
 - 1. ASTM C33 – Standard Specification for Concrete Aggregates.
 - 2. ASTM C94 – Standard Specification for Ready-Mixed Concrete.
 - 3. ASTM C150 – Standard Specification for Portland Cement.
 - 4. ASTM C260 – Standard Specification for Air-Entraining Admixtures for Concrete.
 - 5. ASTM C494 – Standard Specification for Chemical Admixtures for Concrete.
 - 6. ASTM C595 – Standard Specification for Blended Hydraulic Cements.
 - 7. ASTM C1017 – Standard Specification for Chemical Admixtures for use in Producing Flowing Concrete.
 - 8. ASTM C1107 – Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

9. ASTM D994 – Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
10. ASTM D1190 – Standard Specification for Concrete Joint Sealer Hot-Applied Elastic Type.
11. ASTM E1643 – Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.
12. ASTM E1745 – Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

1.03 SUBMITTALS

- A. Section SC-11 – Shop Drawings and Samples: Requirements for Submittal.
- B. Design Data:
 1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:
 - a. Hot and cold weather concrete work.
 - b. Air entrained concrete work.
 2. Identify mix ingredients and proportions, including admixtures.

1.04 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301.

PART 2 – PRODUCTS

2.01 CONCRETE MATERIALS

- A. Cement: ASTM C150, Type I Portland type.
- B. Fine and Coarse Aggregates: ASTM C33.
- C. Water: Clean and not detrimental to concrete.

2.02 ADMIXTURES

- A. Furnish materials in accordance with local standards.
- B. Air Entrainment: ASTM C260
- C. Chemical: ASTM C494 Type A – Water Reducing, Type B – Retarding
- D. Fly Ash: ASTM C618 Class F.

2.03 ACCESSORIES

- A. Bonding Agent: Epoxy-modified cementitious
- B. Non-Shrink Grout: ASTM C1107, Grade A (Section 03600, GROUT)
- C. Waterstop or Vapor barrier

2.04 JOINT DEVICES AND FILLER MATERIALS

- A. Joint Filler: ASTM D1751.
- B. Expansion and Contraction Joint Devices: ASTM B221.

2.05 CONCRETE MIX

- A. Mix concrete in accordance with ACI 301. Deliver concrete in accordance with ASTM C94.
- B. Select proportions for normal weight concrete in accordance with ACI 301 trial mixtures.
- C. Provide concrete to the following criteria:

<u>Unit</u>	<u>Measurement</u>
Compressive Strength (28 day)	4000 psi
Coarse Aggregate	ASTM C 33, Class 35
Fine Aggregate	ASTM C 33
Water/Cement Ratio (maximum)	0.45 by weight
Slump -	4 inches plus or minus 1 inch.

The Contractor is cautioned that the limiting parameters specified above are NOT a mix design. Additional cement or water reducing agent may be required to achieve workability demanded by the Contractor's construction

methods and aggregates. The Contractor is responsible for any costs associated with furnishing concrete with the required workability.

- D. Admixtures: Include admixture types and quantities indicated in concrete mix designs approved through submittal process.
 - 1. Add air entraining agent to normal weight concrete mix for work exposed to exterior.

2.06 CONTROLLED LOW-STRENGTH MATERIAL (CLSM, FLOWABLE FILL)

- A. CLSM shall be a mixture of cement, pozzolan, coarse and fine aggregate, admixtures, and water batched by a ready-mix concrete plant and delivered to the site of the work by means of standard, transit mixing trucks. The mixture shall produce a cementitious hand-excavatable material.
- B. The actual mix proportion, slump, and water-reducing agent shall be determined by the Contractor to meet the uses specified herein.
- C. The entrained air content shall be a minimum of 8 percent and a maximum of 20 percent as required by the Contractor to meet the uses specified herein.
- D. The minimum 28-day compressive strength shall be 50 psi, and the maximum 28-day compressive strength shall be 150 psi.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify requirements for concrete cover over reinforcement.
- B. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

3.02 PLACING CONCRETE

- A. Place concrete in accordance with ACI 301, ACI 318.
- B. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints are not disturbed during concrete placement.

- C. Repair vapor barrier damaged during placement of concrete reinforcing. Repair with vapor barrier material; lap over damaged areas minimum 12 inches and seal watertight.
- D. Separate slabs on grade from vertical surfaces with ½ inch thick joint filler.
- E. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- F. Place concrete continuously between predetermined expansion, control, and construction joints.
- G. Saw cut joints within 12 hours after placing. Use 3/16 inch thick blade, cut into ¼ inch depth of slab thickness.
- H. Screed slabs on grade level, maintaining surface flatness of maximum ¼ inch in 10 feet.

3.03 CURING AND PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

3.04 FIELD QUALITY CONTROL

- A. Submit proposed mix design to testing firm for review prior to commencement of Work.
- B. Tests of cement and aggregates may be performed to ensure conformance with specified requirements.
- C. Three concrete test cylinders will be taken for every 200 or less cu yds of concrete placed.
- D. One slump test will be taken for each set of test cylinders taken.
- E. Maintain records of concrete placement. Record date, location, quantity, air temperature and test samples taken.

3.05 PATCHING

- A. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify ENGINEER upon discovery.
- B. Patch imperfections in accordance with ACI 301.

3.06 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- B. Repair or replacement of defective concrete will be determined by ENGINEER.

END OF SECTION

SECTION 03410

PLANT-PRECAST STRUCTURAL CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes structural precast concrete for CI:
 - 1. Wet Well
 - 2. Valve Vault

1.02 DESIGN REQUIREMENTS

- A. Design and construct to dimensions indicated on the plans and to support own weight and imposed live loads as well as loads due to lateral pressure of soil, water in soil and reactions from access hatch cover.
- B. Live Loads: Design live loads shall be as follows:
 - 1. Valve Vault: HS20 traffic rating minimum.
 - 2. Wet Well: HS20 traffic rating minimum.
- C. Lateral Pressure: Soil design parameters per CALTRANS Bridge Design Practice, Section 6 – Underground Structures.
- D. Design and detail elements and connections to resist forces in accordance with the 2010 California Building Code requirements and ACI 318-05.
- E. Design members exposed to weather to allow movement of components without damage, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to seasonal or cyclic day/night temperature ranges.
- F. Design system to accommodate construction tolerances and clearances of intended openings.
- G. Calculate structural properties of members in accordance with ACI 318-05.
- H. Provide embed items as required to accommodate installation of access hatches.

1.03 SUBMITTALS

- A. Section 01330 – Contractor Submittals
- B. Shop Drawings: Indicate layout, unit locations, fabrication details, reinforcement, connection details, support items, dimensions, openings, openings intended to be field cut, and relationship to adjacent materials; design loads, deflections, cambers, bearing requirements, and special conditions; signed and sealed by professional engineer.
- C. Product Data: Anchorage and lifting inserts and devices.
- D. Certificates: Submit Statement of Compliance, supporting data, from materials supplier attesting that precast concrete valve vaults, wet wells, and meter vaults provided meet or exceed ASTM C890 and C913, and specification requirements.
- E. Design Data:
 - 1. Precast concrete members design calculations.
 - 2. Concrete mix design.
 - 3. Submit copies of test reports showing that the mix has been successfully tested to produce concrete with the properties specified and will be suitable for the job conditions.

1.04 QUALITY ASSURANCE

- A. Perform Work in accordance with Marina Coast Water District standard specifications.
- B. Maintain one copy of document on site.

1.05 QUALIFICATIONS

- A. Fabricator: Company specializing in performing work of this section with minimum three years documented experience.
- B. Design precast concrete members under direct supervision of Professional Engineer experienced in design of this work and licensed in the State of California.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Handle precast members in position consistent with their shape and design. Lift and support only from support points indicated on the shop drawings.

- B. Lifting or Handling Devices: Capable of supporting member in positions anticipated during manufacture, storage, transportation and erection.
- C. Protect members to prevent staining, chipping or spalling of concrete.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Cement: ASTM C150 Type II.
- B. Aggregate, Sand, Water, Admixtures: Determined by precast fabricator conforming to design requirements.

2.02 REINFORCEMENT

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60, deformed steel bars.

2.03 ACCESSORIES

- A. Connecting and Supporting Devices: ASTM A666 stainless steel plates, angles.
- B. Grout: Non-shrink minimum strength of 8,000 psi at 28 days.
- C. Bolts, Nuts and Washers: Corrosion resistant chromium-nickel type.

2.04 FABRICATION

- A. Fabrication procedure to conform to ASTM C913, to dimensions indicated on Drawings, and to specified design criteria.
- B. Maintain plant records and quality control program during production of precast members. Make records available upon request.
- C. Ensure reinforcing steel, anchors, inserts, plates, angles, and other cast-in items are embedded and located as indicated on shop drawings. ACI 318/318M for placement and splicing. Reinforcement may be preassembled before placement in forms. Provide exposed connecting bars or other approved connection methods between precast and cast-in-place construction. Remove any excess mortar that adheres to the exposed connections.
- D. Concrete Curing: Commence curing immediately following the initial set and completion of surface finishing. Provide curing procedures to keep the temperature of the concrete between 50 and 190 degrees F. When accelerated curing is used, apply heat at controlled rate and uniformly

along the casting beds. Monitor temperatures at various points in a product line in different casts.

2.05 FINISHES

- A. Finish exposed-to-view finish surfaces of precast concrete members uniformly in color and appearance.

2.06 PREFORMED JOINT SEALANT – WET WELL

- A. Joint sealing compound shall be a performed, cold-applied, ready to use plastic joint sealing compound Quick-Seal, Ram-Nek; or equal.

2.07 EXTERIOR JOINT SEALS – WET WELL

- A. Seals: The Contractor shall provide external joint seals and riser seals for all manholes, in addition to the performed plastic sealing gaskets used between each barrel, cone or grade ring section. External joint seals for the barrel and cone sections shall be an external rubber sleeve, Infi-Shield Seal Wrap, or equal. The seal shall be made of ethylene propylene diene monomer (EPDM) rubber with a maximum thickness of 60 mils. Each unit shall have a 2-inch-wide mastic strip on the top and bottom edge of the rubber wrap. The mastic shall be non-hardening butyl rubber sealant, with a minimum thickness of 1/4 inch. The seal shall be designed to prevent leakage of water into the manhole.

2.08 INTERIOR LINING – WET WELL

- A. Line wet well interior with T-Loc lining or approved equal.

PART 3 - EXECUTION

3.01 EXAMINATION AND PREPARATION

- A. Verify site conditions are ready to receive work and field measurements are as instructed by fabricator.
- B. Prepare support equipment for erection procedure, temporary bracing, and induced loads during erection.
- C. Perform work in accordance with Marina Coast Water District standard specifications.

3.02 SURFACE REPAIR

- A. Prior to erection, and again after installation, precast members shall be checked for damage, such as cracking, spalling, and honeycombing. As

directed by the Owner, precast members that do not meet the surface finish requirements specified in Part 2 in the paragraph entitled "Finishes" shall be repaired or removed and replaced with new precast members.

3.03 ERECTION

- A. Precast members shall be erected after the concrete has attained the specified compressive strength, unless otherwise approved by the precast manufacturer. Erect in accordance with the approved shop drawings by the precast manufacturer. Follow the manufacturer's recommendations for maximum construction loads. Place precast members level, plumb, square, and true within tolerances.

3.04 BEARING SURFACES

- A. Shall be flat, free of irregularities, and properly sized. Size bearing surfaces to provide for the indicated clearances between the precast member and adjacent precast members or adjoining field placed surfaces. Correct bearing surface irregularities with non-shrink grout. Provide bearing pads where indicated or required. Do not use hardboard bearing pads in exterior locations. Place precast members at right angles to the bearing surface, unless indicated otherwise, and draw up tight without forcing or distortion with sides plumb.

3.05 OPENINGS

- A. Holes or cuts requiring reinforcing to be cut that are not indicated on the approved shop drawing shall only be made with the approval of the Engineer and the precast manufacturer. Drill holes less than 12 inches in diameter with a diamond tipped core drill.

END OF SECTION

SECTION 03600

GROUT

PART 1 GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall provide all materials, equipment, and labor necessary to furnish and place grout and shall form, mix, place, cure, repair, finish, and do all other work as necessary to produce finished grout as shown on the Drawings and as specified herein.
- B. The following types of grout shall be covered in this Section:
 - 1. Non-Shrink Grout: Non-Shrink grout is to be used unless another type is specifically referenced or as shown on the Drawings.
 - 2. Epoxy Grout
 - 3. Cement Grout

1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Specifications, codes, and standards shall be as specified in Section 03300, "Cast-in-Place Concrete," and as referred to herein.
- B. Commercial Standards:
 - ASTM C 109 Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-In. or 50-mm Cube Specimens).
 - ASTM C 531 Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing.
 - ASTM C 579 Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing.
 - ASTM C 827 Test Method for Change in Height of Early Ages of Cylindrical Specimens from Cementitious Mixtures.
 - ASTM D 696 Test Method for Coefficient of Linear Thermal Expansion of Plastics.
 - CRD-C 621 Corps of Engineers Specification for Non-shrink Grout.

1.03 CONTRACTOR SUBMITTALS

- A. Certificates of Compliance: Certificates of Compliance shall be provided for all products and materials proposed to be used under this Section.

PART 2 - PRODUCTS

2.01 PREPACKAGED GROUTS

- A. Non-Shrink Grout:
 - 1. Non-shrink grout shall be a prepackaged, inorganic, non-gas-liberating, non-metallic, cement-based grout requiring only the addition of water. Manufacturer's instructions shall be printed on each bag or other container in which the materials are packaged. The specific formulation for each class of non-shrink grout specified herein shall be that recommended by the manufacturer for the particular application.
 - 2. Class A non-shrink grouts shall have a minimum 28-day compressive strength of 5000 psi; shall have no shrinkage (zero percent) and a maximum 4.0 percent expansion in the plastic state when tested in accordance with ASTM C 827; and shall have no shrinkage (zero percent) and a maximum of 0.2-percent expansion in the hardened state when tested in accordance with CRD C 621.
 - 3. Class B non-shrink grouts shall have a minimum 28-day compressive strength of 5000 psi and shall meet the requirements of CRD C 621.
 - 4. Application:
 - a. Class A non-shrink grout shall be used for the repair of all holes and defects in concrete members which are water bearing or in contact with soil or other fill material, grouting under all equipment base plates, and at all locations where grout is specified; except, for those applications for Class B non-shrink grout and epoxy grout specified herein. Class A non-shrink grout may be used in place of Class B non-shrink grout for all applications.
 - b. Class B non-shrink grout shall be used for the repair of all holes and defects in concrete members which are not water-bearing and not in contact with soil or other fill material.

B. Epoxy Grout:

1. Epoxy grout shall be a pourable, non-shrink, 100-percent solids system. The epoxy grout system shall have 3 components: resin, hardener, and specially blended aggregate, all premeasured and prepackaged. The resin component shall not contain any non-reactive diluents. Resins containing butyl glycidyl ether (BGE) or other highly volatile and hazardous reactive diluents are not acceptable. Variation of component ratios is not permitted unless specifically recommended by the manufacturer. Manufacturer's instructions shall be printed on each container in which the materials are packaged.
2. The chemical formulation of the epoxy grout shall be that recommended by the manufacturer for the particular application.
3. The mixed epoxy grout system shall have a minimum working life of 45 minutes at 75 degrees F.
4. The epoxy grout shall develop a compressive strength of 5000 psi in 24 hours and 10,000 psi in 7 days when tested in accordance with ASTM C 579, Method B. There shall be no shrinkage (zero percent) and a maximum 4.0 percent expansion when tested in accordance with ASTM C 827.
5. Application: Epoxy grout shall be used to embed all anchor bolts and reinforcing steel required to be set in grout, and for all other specified applications.

2.02 CEMENT GROUT

- A. Cement Grout: Cement grout shall be composed of one part cement, 3 parts sand, and the minimum amount of water necessary to obtain the desired consistency. Where needed to match the color of adjacent concrete, white portland cement shall be blended with regular cement as needed. The minimum compressive strength at 28 days shall be 4000 psi.
- B. Cement shall be as specified in Section 03300, "Cast-in-Place Concrete."

2.03 CONSISTENCY

- A. The consistency of grouts shall be that necessary to completely fill the space to be grouted for the particular application. Dry pack consistency is such that the grout is plastic and moldable but will not

flow. Where "dry pack" is specified, it shall mean a grout of that consistency; the type of grout to be used shall be as specified herein for the particular application.

2.04 MEASUREMENT OF INGREDIENTS

- A. Measurements for cement grout shall be made accurately by volume using appropriate containers. Shovel measurement will not be allowed.
- B. Prepackaged grouts shall have ingredients measured by means recommended by the manufacturer.

PART 3 - EXECUTION

3.01 GENERAL

- A. All surface preparation, curing, and protection of cement grout shall be as specified in Section 03300, "Cast-in-Place Concrete." The finish of the grout surface shall match that of the adjacent concrete.
- B. The manufacturer of Class A non-shrink grout and epoxy grout shall provide on-site technical assistance upon request.
- C. All mixing, surface preparation, handling, placing, consolidation and other means of execution for prepackaged grouts shall be done according to the printed instructions and recommendations of the manufacturer.

3.02 CONSOLIDATION

- A. Grout shall be placed in such a manner, for the consistency necessary for each application, so as to assure that the space to be grouted is completely filled.

END OF SECTION

SECTION 05120
STRUCTURAL STEEL

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes structural steel sections and connecting elements.
- B. Related Sections:
 - 1. Section 05500 - Metal Fabrications.

1.02 REFERENCES

- A. American Society for Testing and Materials:
 - 1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
 - 2. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
- B. American Welding Society:
 - 1. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
 - 2. AWS D1.1 - Structural Welding Code - Steel.

1.03 SUBMITTALS

- A. Shop Drawings:
 - 1. Indicate sizes, spacing, and locations of structural members and attachments.
 - 2. Indicate splice locations.
 - 3. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.

1.04 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with AISC – Specification for Design, Fabrication, and Erection of Structural Steel for Buildings.

- B. Welding: In accordance with AWS D1.1.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Structural Steel Members: ASTM A572/A572M, Grade 50.
- B. Plates: ASTM A36/A36M.
- C. Welding Materials: AWS D1.1; type required for materials being welded.
- D. Pipe: ASTM A53/A53M, Grade B.
- E. Grout: Non-shrink type, premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing additives, capable of developing minimum compressive strength of 7,000 psi at 28 days.

2.02 FABRICATION

- A. Grind exposed welds smooth.

PART 3 - EXECUTION

3.01 ERECTION

- A. Allow for erection loads. Install temporary bracing to maintain framing in alignment until completion of all welded connections.
- B. Field weld components indicated on Drawings.
- C. Do not field cut or alter structural members without approval of Engineer.

END OF SECTION

SECTION 05500
METAL FABRICATIONS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Aluminum access hatch covers.

1.02 SYSTEM DESCRIPTION

- A. General: Access hatch covers leaves shall be constructed of aluminum diamond plate. Supporting frame shall be constructed of aluminum extruded sections and shall be constructed to allow for adequate water drainage. A continuous gasket shall be mechanically attached to the cover. Access hatch covers shall be equipped with aluminum hinges and pivot so that the cover does not protrude into the frame. Compression spring operators shall be provided for controlled access hatch covers operation throughout the entire arc of opening and closing. The access hatch covers shall automatically lock in the vertical position when opened. Entire access hatch covers, including all hardware components, shall be corrosion resistant. Miscellaneous hardware items shall be fabricated from materials at the discretion of the manufacturer with that exception that they shall be corrosion resistant and shall be guaranteed to be free of defects in materials and workmanship as stated in the quality assurance provisions.
- B. H-20 Rated Access Hatch Covers: Access hatch covers assembly shall be designed to withstand an H-20 wheel load placed at any location on top of the closed access hatch covers with a maximum deflection of 1/150 of the span.
- C. Standard Pedestrian Rated Access Hatch Covers: Access hatch covers assembly shall be designed to withstand a 300-pound-per-square-foot live load placed on top of the closed access hatch covers with a maximum deflection of 1/150 of the span.

1.03 SUBMITTALS

- A. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
- B. Calculations: Specify design loads and all calculations verifying compliance with deflection requirements.

1.04 QUALITY ASSURANCE

- A. Manufacturer shall provide a written guarantee against defects in materials or workmanship to cover a period of 10 years from date of receipt of access hatch covers by District.

PART 2 - PRODUCTS

2.01 METAL FABRICATIONS

- A. Fabricators:
 - 1. Syracuse Castings, P.O. Box 1821, Cicero, NY.
 - 2. The Bilco Company, PO Box 1203, New Haven, CT 06505.
 - 3. Flygt, 1 International Drive, Rye Brook, NY 10573
 - 4. Substitutions: Permitted upon approval by Engineer.

2.02 COMPONENTS

- A. Aluminum Diamond Patterns Plate: AA 5086 H112.
- B. Aluminum Extrusions: AA 6063T5 or AA 6061T6.
- C. Stainless Steel: AISI 316.

2.03 ACCESSORIES

- A. Welding Materials: AWS D1.1.

2.04 FABRICATION

- A. General:
 - 1. Fit and shop assemble items in largest practical sections, for delivery to site.
 - 2. Exposed Mechanical Fastenings: Flush countersunk screws or bolts, consistent with design of component.
 - 3. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify field conditions are acceptable and are ready to receive Work.

3.02 PREPARATION

- A. Supply items required to be cast into concrete with setting templates, to appropriate sections.

3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Field weld components indicated on shop drawings. Perform field welding in accordance with AWS D1.1.
- C. Obtain approval prior to site cutting.
- D. After erection, touch up welds, abrasions, and damaged finishes with prime paint or galvanizing repair paint to match shop finishes.

3.04 SCHEDULES

- A. Access hatch covers schedule is as follows:

Lift Station	Item	Access Hatch Cover Type
Imjin	Valve Vault	H-20 Rated Access Hatch Cover
	Wet Well	H-20 Rated Access Hatch Cover

END OF SECTION

SECTION 09800
PROTECTIVE COATINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES

Surface preparation and field application of protective coatings.

1.02 RELATED SECTIONS

- A. Section 15200 – Piping Systems
- B. Section 03410 – Plant – Precast Structural Concrete
- C. Division 16 – Electrical

1.03 REFERENCES

- A. ASTM D16: Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.
- B. SSPC (Steel Structures Painting Council): Steel Structures Painting Manual.

1.04 DEFINITIONS

Conform to ASTM D16 for interpretation of terms used in this Section.

1.05 SUBMITTALS

- A. Product Data: Provide data on all finishing products.
- B. Manufacturer's Instructions: Indicate special surface preparation procedures, substrate conditions requiring special attention.
- C. Material Safety Data Sheets (MSDS) for each product used.

1.06 REGULATORY REQUIREMENTS

Conform to applicable code for flame and smoke rating and volatile organic compound (VOC) requirements for finishes.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container label to include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Store paint materials at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Do not apply exterior coatings during rain or snow.
- C. Air and surface temperature must be above 50 degrees F and at least 5 degrees F above the dew point and below 110 degrees F. Humidity must not exceed 85 percent.
- D. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Use of manufacturer's name and brand is for purpose of establishing the standard of quality.
- B. Substitution of equal products permitted provided substitutions are approved by the ENGINEER.

2.02 MATERIALS

- A. Coatings: Ready mixed, except field-catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating; good flow and brushing properties; capable of drying or curing free of streaks or sags.

- B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.
- C. Patching Materials: Fillers compatible with coatings.
- D. Mix and thin materials according to manufacturer's printed instructions.
- E. Do not use mixed materials beyond manufacturer's recommended pot life.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces to be coated and report any conditions that would adversely affect the appearance or performance of the coating systems and which cannot be put into acceptable condition by the preparatory work specified.
- C. Verify with Manufacturer that shop applied primer is compatible with subsequent cover materials.
- D. Do not proceed with surface preparation and application until the surface is acceptable and authorization to proceed is given by the ENGINEER.

3.02 PREPARATION

- A. General:
 - 1. Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
 - 2. Dislodge dirt, rust, mortar spatter and other dry material by scraping or brushing. Remove dust and loose material by brushing, sweeping, vacuuming, or blowing with high-pressure air.
 - 3. Remove oil, wax, and grease by scraping off heavy deposits and cleaning with mineral spirits or a hot biodegradable detergent solution followed by a water rinse. Refer to SSPC-SP1 Solvent Cleaning.
 - 4. Verify that surfaces to be coated are dry, clean, and free of dust, dirt, oil, wax, grease, or other contaminants.

5. Correct defects and clean surfaces which affect work of this section.
 6. All surfaces must be prepared in accordance with Manufacturer's instructions.
- B. Concrete:
1. Scrape or grind all fins and protrusions flush with surface.
 2. Patch holes and cracks flush with surface.
 3. Rake mortar joints clean.
 4. Remove surface laitance or efflorescence by acid etching or whip abrasive blasting as necessary per SSPC-SP13 Surface Preparation of Concrete.
- C. Iron:
1. Preclean with solvents to remove grease, oil and other soluble contaminants.
 2. If surface profile is less than 1.5 mils, use brush-off blast cleaning.
 3. If surface profile is 1.5 mils or greater, use hand or power tool cleaning.
 4. Protect from moisture: all surfaces must be dry, clean and at least 5 F above dew point during coating applications.

3.03 APPLICATION

- A. Apply products at specified film thickness in accordance with manufacturer's instructions.
- B. Do not apply finishes to surfaces that are not dry.
- C. Allow each coat to dry thoroughly before recoating. Follow manufacturer's recommended minimum and maximum recoat times.
- D. Cut edges clean and sharp where work joins other materials.
- E. Make finish coats smooth, uniform in color, and free of brush marks, laps, runs, dry spray, overspray, and skipped or missed areas.

- F. Prime concealed surfaces of interior and exterior woodwork with primer paint.

3.04 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Paint shop primed equipment.
- B. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- C. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, except where items are prefinished.
- D. Paint exposed conduit and electrical equipment occurring in finished areas.
- E. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.05 FIELD QUALITY CONTROL

- A. Obtain acceptance of each coat before applying succeeding coats.
- B. Touch-up and repair all work that is not acceptable to ENGINEER and obtain final acceptance.
- C. Touch-up painting of field- and factory-applied coatings shall be performed in accordance with manufacturer's recommendations.

3.06 CLEANING

- A. Collect waste material which may constitute a fire hazard, place in closed metal containers and remove daily from site.
- B. Remove paint spatters from adjoining surfaces.
- C. Repair any damage to coatings or surfaces caused by cleaning operations.
- D. Remove debris from job site and leave storage areas clean.

3.07 DRY-FILM THICKNESS TESTING

- A. Measure coating thickness specified for metal surfaces with a majestic-type dry-film thickness gage. Test the finish coat (except zinc primer and galvanizing) for holidays and discontinuities with an electrical holiday detector, low-voltage, wet-sponge type. Measuring equipment shall be

provided by the contractor. Provide detector as manufactured by Tinker and Razor or K-D Bird Dog. Provide dry-film thickness gage as manufactured by Mikrotest or Elcometer. Check each coat for the correct dry-film thickness. Do not measure within eight hours after application of the coating.

- B. If the item has an improper finish color or insufficient film thickness, the surface shall be cleaned and topcoated with the specified paint material to obtain the specified color and coverage. Visible areas of chipped, peeled, or abraded paint shall then be primed and finish coated in accordance with the specifications. Work shall be free of runs, bridges, shiners, laps, or other imperfections.

3.08 WARRANTY INSPECTION

- A. Warranty inspections shall be conducted during the eleventh (11th) month following completion of all coating work. Personnel present during the pre-construction meeting shall be present at this inspection. All defective work shall be repaired per the approved work plan as submitted by the contractor.

3.09 SCHEDULES

APPLICATION	SURFACE PREP	PRIMER	FINISH
Ductile Iron Piping and Fittings (Outside Exposure)	SSPC-SP6	Epoxy – Tnemec Series N69 Hi-Build Epoxoline II 3.0-5.0 mils DFT	Solvent Based, Aliphatic Acrylic Urethane – Tnemec Series 1075 Endura-Shield II 3.0-5.0 mils DFT
Ductile Iron Piping and Fittings (in vaults)	SSPC-SP6	Epoxy – Tnemec Series N69 Hi-Build Epoxoline II 3.0-5.0 mils DFT	Epoxy – Tnemec Series N69 Hi-Build Epoxoline II 3.0-5.0 mils DFT
Ductile Iron Piping, Fittings, and Tie Rods (Buried)	Manufacturer’s Applied Coating	Trenton Tem Coat Primer or Wax Tape Primer	Trenton #1 Wax Tape and Trenton Poly-Ply or Guard Wrap Outer Wrap
Pipe Supports	-	304 Stainless Steel	-
Wet Well & Vault Floor, Bottom and Top Slab (Interior)	SSPC-SP13		Ultra High Build Epoxy Coating – Raven Lining Series 405 100 mil DFT

END OF SECTION

SECTION 11900
SUBMERSIBLE PUMPS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Provide submersible pumps including motor, close coupled volute, cast iron discharge elbow, guide rail system, guide bar brackets, SS lifting chain, power cable and accessories.

B. Related Sections:

1. Section 15050 – Pipe and Fittings
2. Section 16123 – 600-Volt Wire and Cable

1.2 REFERENCES

A. ASTM International:

1. ASTM A48/A48M - Standard Specification for Gray Iron Castings.
2. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes.

B. National Electrical Manufacturers Association:

1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

1.3 SUBMITTALS

A. Section 01330 – Contractor Submittals: Requirements for submittals.

B. Shop Drawings:

1. Submit detailed dimensions for materials and equipment, including pump outline drawing, station drawing for accessories, access frame drawing, wiring and control diagrams, performance charts and curves, installation and anchoring requirements, fasteners, and other details.
2. Include manufacturer's specified displacement tolerances for vibration at operational speed specified for pumps.

3. Submit detailed test plan for testing.
- C. Product Data:
1. Submit information concerning materials of construction, fabrication, and protective coatings.
 2. Submit Electrical Motor Data.
 3. Submit Control Data.
 4. Submit Technical Manuals.
 5. Submit Parts List.
- D. Manufacturer's Installation Instructions: Submit detailed instructions on installation requirements including storage and handling procedures, anchoring, layout and Start-up Report Forms.
- E. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.
- F. Manufacturer's Warranty: Submit Printed Warranty.
- G. Manufacturer's Field Reports: Certify equipment has been installed in accordance with manufacturer's instructions.

1.4 CLOSEOUT SUBMITTALS

- A. Section 01770 – Project Closeout: locations and final orientation of equipment and accessories.
- B. Operation and Maintenance Data:
1. Submit maintenance instructions for equipment and accessories.
 2. Furnish list of equipment and tools needed to maintain and calibrate equipment.

1.5 QUALITY ASSURANCE

- A. Provide heavy duty, electric submersible, centrifugal non-clog units designed for handling raw unscreened sewage and wastewater and shall be fully guaranteed for this use.
- B. Provide pumps that operate in an ambient liquid temperature of 104 degrees F. Since the high temperature of 104 degrees F is specified by the National Electrical Manufacturers Association (NEMA) and Factory Mutual (FM), motors with a maximum ambient temperature rating below 104 degrees F shall not be acceptable.

- C. Provide pump and motor unit that is suitable for continuous operation at full nameplate load while the motor is completely submerged, partially submerged or totally non-submerged. The use of shower systems, secondary pumps or cooling fans to cool the motor shall not be acceptable.
- D. Provide pump, mechanical seals and motor unit from the same manufacturer in order to achieve standardization of operation, maintenance, spare parts, manufacturer's service and warranty.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum five years documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Inspect for damage.
- B. Store products in areas protected from weather, moisture, or possible damage; do not store products directly on ground; handle products to prevent damage to interior or exterior surfaces.

1.8 EXTRA MATERIALS

- A. Furnish one complete set of manufacturer's recommended spare parts for each pump including:
 - 1. One set lower and upper seals.
 - 2. One set lower and upper bearings.
 - 3. Impeller wear ring.
- B. Furnish special tools required for equipment maintenance.

1.9 TESTING

- A. Provide testing for each pump including:
 - 1. Impeller, motor rating, and electrical connections shall be checked for compliance with this specification.
 - 2. Prior to submergence, each pump shall be run dry to establish correct rotation.
 - 3. Each pump shall be run submerged in water.
 - 4. Motor and cable insulation shall be tested for moisture content or insulation defects.

- B. Upon request, a written quality assurance record confirming the above testing/inspections shall be supplied with each pump at the time of shipment.
- C. Each pump shall be tested in accordance with the latest test code of the Hydraulic Institute (H.I.) at the manufacturer to determine head vs. capacity and kilowatt draw required. Witness tests shall be available at the factory upon request.
- D. Factory Test: The submersible pumps shall be tested at the factory for compliance with the specifications for electrical, mechanical and physical characteristics. Each pump/motor shall be tested for flow / head / overall efficiencies / kw / amps / volts for each of the operating points that are specified. A total of five (5) points shall be documented to establish the pump curve. All tests shall be run in accordance with the American Hydraulic Institute Standards. Testing shall also include the following:
 - 1. Impeller, motor rating and electrical connections shall be checked for compliance to the specifications.
 - 2. The motor insulation and power cable shall be tested for moisture content or insulation defects.
 - 3. Prior to submergence, the pump shall be run dry to establish correct rotation and mechanical integrity.
 - 4. The pump shall be run for a minimum of 30 minutes submerged to bring the motor to operating temperature.
 - 5. After the operational test, the insulation test shall be accomplished again as well as a mechanical and electrical inspection of the pump/motor.
 - 6. Provide the following results in table form and curve form for five duty points at 60 hertz:
 - a. Flow, Gpm
 - b. Head, ft
 - c. Power input: kw
 - d. Overall efficiency: %
 - e. Motor current, amp
 - f. Motor voltage, volt

The manufacturer shall provide a written report on the factory tests to the Engineer prior to shipment of the equipment for approval. The equipment shall not be shipped from the factory until the factory tests for each pump/motor are approved by the Engineer.

1.10 START-UP SERVICE

- A. Provide Manufacturer qualified factory trained field service engineer services for an 8-hour working day at the site to inspect the installation and instruct the Owner's personnel on the operation and maintenance of the

pumping units. After the pumps have been completely installed and wired, the Contractor shall have the manufacturer do the following:

1. Megger stator and power cables.
 2. Check seal lubrication.
 3. Check for proper rotation.
 4. Check power supply voltage.
 5. Measure motor operating load and no load current.
 6. Check level control operation and sequence.
- B. During this initial inspection, the Manufacturer's service representative shall review recommended operation and maintenance procedures with the Owner's personnel.

PART 2 PRODUCTS

2.1 SUBMERSIBLE PUMP

A. Rated Conditions:

1. Rated condition after Project construction with existing 10" forcemain:
 - a. 1,250 gpm @ 85' TDH (using a single new duty pump per paragraph B)
 - b. The existing two pumps [NP 3153.433 MT] shall be used together as standby/backup pumps with a limited combined capacity of approximately 1,000 gpm @ 70'TDH
2. Future rated condition after future replacement of the existing two pumps [NP 3153.433 MT] with two additional new pumps per paragraph B:
 - a. 1,600 gpm @ 103' TDH (using two duty pumps)
 - b. The third pump will be used as a standby/ backup pump

B. Manufacturers:

1. All new submersible pumps shall be as manufactured by Flygt.

Pump Tags	Pump Model	HP	Impeller Size	Quantity
P-102	FLYGT NP3202.462	44	278 mm	1

2. Substitutions: Not Permitted.

C. General:

1. Submersible non-clog pump, equipped with submersible electric motor. Furnish 50 feet of power and signal hypalon jacketed type SPC cable. Furnish mating cast iron 6 -inch discharge connection elbow. Contractor shall field measure prior to ordering cables.
2. Furnish each pump with 35 feet minimum stainless steel lifting chain of strength to permit raising and lowering pump.
3. Pump Materials of Construction: Compatible with raw sewage.
4. Bearings: minimum L10 life of 100,000 hours at any point along the usable portion of the pump curve at maximum product speed.

D. Pump Design:

1. Capable of handling raw sewage.
2. Discharge connection elbow permanently installed in wet well with discharge piping.
3. Connected automatically to discharge connection elbows when lowered into place and easily removed for inspection or service.
4. Integral sliding guide bracket part of pump unit; entire weight of pump unit guided by two guide bars and pressed tightly against discharge connection elbow with metal-to-metal contact.
5. Do not permit any portion of pump to bear directly on floor of sump.
6. Capable of continuous submergence underwater without loss of watertight integrity.

E. Pump Construction:

1. Gray cast iron, ASTM A48, Class 35B, with smooth surfaces devoid of blow-holes and other irregularities.
2. Exposed nuts and bolts ASTM A276 Type 304 stainless steel construction.
3. Spray exterior with PVC epoxy primer and chloric rubber paint finish.
4. Seal mating surfaces watertight, machined and fitted with nitrile rubber O-rings.
5. Seal fittings by metal-to-metal contact between machined surfaces.

6. All metal surfaces in contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.
7. The pump and motor shaft shall be a single piece unit. The pump shaft is an extension of the motor shaft. Shaft shall be AISI type 431 stainless steel. Shaft sleeves will not be acceptable.

F. Cooling System:

1. Each pump/motor unit shall be provided with an integral, self-supplying cooling system. The motor water jacket shall encircle the stator housing and shall be of cast iron, ASTM A-48, Class 35B.
2. The internals to the cooling system shall be non-clogging by virtue of their dimensions. Drilled and threaded provisions for external cooling and, seal flushing or air relief are to be provided.
3. The cooling system shall provide for continuous submerged or completely non-submerged pump operation in liquid or in air having a temperature of up to 40°C (104°F), in accordance with NEMA standards. Restrictions limiting the ambient or liquid temperatures at levels less than 40°C are not acceptable.

G. Cable Entry Seal:

1. Design cable entry water seal of single cylindrical elastomer grommet, flanked by stainless steel washers, with close tolerance fit against cable outside diameter and entry inside diameter and compressed by entry body containing strain relief function, separate from function of sealing cable.
2. Bear assembly against shoulder in pump top.
3. Separate cable entry junction chamber and motor by stator lead sealing gland or terminal board, that isolates motor interior from foreign material gaining access through pump top.

H. Mechanical Seal System:

1. Shaft: ASTM A276 Type 420 stainless steel.
2. Shaft Seal: Tandem mechanical type.
3. Upper Tandem Set of Seals: Operate in oil chamber located just below stator housing; one stationary tungsten-carbide ring and one positively driven rotating carbon ring.

4. Lower Tandem Set of Seals: Stationary tungsten carbide ring and positively driven rotating tungsten carbide ring.
 5. Furnish pump with oil chamber for shaft sealing system; drain and inspection plug, with positive anti-leak seal, accessible from outside.
 6. The pump shaft shall rotate on at least three grease-lubricated bearings. The upper bearing, provided for radial forces, shall be a single roller bearing. The lower bearings shall consist of at least one roller bearing for radial forces and one or two angular contact ball bearings for axial thrust.
- I. Bearings:
1. Bearings: minimum L10 life of 100,000 hours at any point along the usable portion of the pump curve at maximum product speed.
- J. Impeller and Volute:
1. Impeller HardIron™ gray cast iron, ASTM A48, Class 35B, dynamically balanced, semi-open, back swept, screw shaped, non-clog design.
 2. Furnish impeller capable of handling solids, fibrous materials, sludge and other matter normally found in wastewater. Leading edges of impeller shall be hardened to Rc 45.
 3. Furnish impeller of multi-vane design, capable of passing minimum 3-inch solid sphere. Screw shape of impeller shall provide an inducing effect for handling of up to 5% sludge and rag-laden wastewater.
 4. The impeller volute clearance shall be readily adjustable by the means of a single trim screw.
 5. Furnish fit between impeller and shaft sliding fit with one key. Impellers shall be locked to the shaft, held by an impeller bolt and shall be coated with alkyd resin primer.
 6. Volute shall be a single piece gray cast iron ASTM A-48, Class 35B, non-concentric design with smooth fluid passages capable of passing solids passing through impeller.
 7. Install wear ring system for sealing between volute and impeller when required.

8. Furnish wear ring system of stationary ring made of nitrile rubber molded with steel ring insert drive fitted to volute inlet and rotating stainless steel ASTM A276 304 ring drive fitted to impeller skirt.
9. Pump volute shall accommodate mix-flush valve.

K. Pump Motor:

1. Squirrel-cage, induction, shell type, NEMA B design, housed in air-filled, watertight chambers, with a 1.15 service factor.
2. Pump shall be non-overloading throughout its entire performance curve, from shut-off to run-out.
3. Furnish stator windings and stator leads insulated with moisture resistant Class H insulation capable of resisting temperature of 356 degrees F.
4. Insulate stator by the trickle impregnation method using Class H monomer-free polyester resin resulting in a minimum winding factor of 95%.
5. Furnish stators dipped and baked three times in Class F varnish and heat-shrink fitted into stator housings.
6. Furnish motors designed for continuous duty, capable of sustaining minimum of 15 evenly spaced starts per hour.
7. Furnish pump motor capable of operating indefinitely without overheating when unsubmerged and operating in air.
8. Furnish junction chamber, containing terminal board, sealed from motor by elastomer compression seal (O-ring).
9. Furnish connection between cable conductors and stator leads made with threaded compressed type binding post permanently affixed to terminal board.

L. Protection:

1. Each pump motor stator shall incorporate three thermal switches, one per stator phase winding and be connected in series, to monitor the temperature of the motor. Should the thermal switches open, the motor shall stop and activate an alarm. A float switch shall be installed in the seal leakage chamber and will activate if leakage into the chamber reaches 50% chamber capacity, signaling the need to schedule an inspection

2. The thermal switches and float switch shall be connected to a Mini CAS control and status monitoring unit. The Mini CAS unit shall be designed to be mounted in the pump control panel.

M. Guides:

1. Integral lower guide bar holders with discharge connections.
2. Standard weight 3-inch stainless steel pipe guide bars (two) capable of handling a working load of 150% of the pump unit weight. Guide bars will extend from the top of the station to the discharge connection.
3. For the installation of the existing two pumps (NP3153MT) that are being relocated from the existing wet well to the new wet well, provide standard weight 3-inch stainless steel pipe guide bars (two per pump) capable of handling a working load of 150% of the pump unit weight. Guide bars will extend from the top of the station to the discharge connection. New sliding brackets shall be installed to allow for fitting on the 3-inch guide bars and new discharge connections to accommodate the new pump configuration as well as the old pumps.

N. Electrical Characteristics and Components

1. Electrical Characteristics: In accordance with Division 16 specifications and the following:
 - a. Motor Horsepower = 44
 - b. 460 volts, three phase, 60 Hz.
 - c. Amperes thermal magnetic circuit breaker size.

~~O. FLUSH VALVE~~

- ~~1. Furnish and install a Flygt flush valve to mix the wastewater automatically. The valve is to be mounted directly on the pump volute to direct part of the pumped discharge to flush solids into suspension at the start of each pumping cycle. The valve shall be positioned on the pump volute to provide a non-clogging flow operation~~

~~The pump volute must have a special mounting flange to allow for the proper flow exit angle and to strengthen the volute wall in order to withstand the shock loads imposed by the valve. The valve and the volute location is specific to certain pump models. The valve manufacturer and the pump manufacturer must both certify the use of the valve on the pump being used. A letter in writing must be~~

~~provided by each manufacturer certifying the use of the valve on the pump, including a written warranty. The pump shall have a boss on the volute to accept the valve.~~

~~The valve shall be open at the beginning of each pumping cycle and close under full pump discharge pressure after a pre selected time. The valve shall be operated by the liquid being pumped through a self contained hydraulic system. No external power source should be required to operate the valve. The valve shall be controlled by hydraulic pressure from the pump, external electrical, hydraulic or pneumatic lines shall not be allowed. A means of adjustment should be provided to achieve a 30 second flushing period for different head and flow conditions.~~

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install pumps and accessories where indicated on Drawings and in accordance with manufacturer's instructions.
- B. Provide and connect piping, accessories, power and control conduit and wiring to make system operational, ready for startup.
- C. Flush piping with clean water.

3.2 FIELD QUALITY CONTROL

- A. Pre-operational Check: Before operating system or components, make the following checks:
 - 1. Check for proper motor rotation.
 - 2. Check pump and drive units for proper lubrication.
- B. Verify pump performance by performing time/draw down test or time/fill test.
- C. Check pump and motor for high bearing temperature and excessive vibration. Check for motor overload by taking ampere readings.
- D. Equipment Acceptance:
 - 1. Adjust, repair, modify or replace system components that fail to perform as specified and rerun tests. Make final adjustments to equipment under direction of manufacturer's representative.
 - 2. Document adjustments, repairs and replacements in manufacturer's field services certification.

- E. Record all data and work described in Field Quality Control section. Provide report to the City for review.

3.3 MANUFACTURER'S FIELD SERVICES

- A. Furnish services of manufacturer's representative experienced in installation of products furnished under this specification for not less than one man-day on-site for installation inspection and field testing, and instructing Owner's personnel in maintenance of equipment.

Local authorized service companies:

1. ITT Flygt CA
790-A Chadbourne Road
Fairfield, CA 94534-9643
Phone: (707) 422-9894
2. Shape Inc
114 Val Dervin Parkway Ste 2
Stockton, CA 95206
Phone: (209) 234-5909

- B. Certify that equipment has been properly installed and is ready for start-up and testing.

3.4 DEMONSTRATION

- A. Prior to testing each phase, demonstrate equipment startup, shutdown, routine maintenance, hydraulic performance as per design specification, alarm condition responses, and emergency repair procedures to Owner's personnel.
- B. The wastewater flow to the pump station will be used for the demonstration.
- C. Contractor shall submit a test plan to the City for approval. The test plan shall provide necessary equipment to simulate the design operations of the pump station. The setup should be able to alter the wet well water elevation for the high level alarm testing.
- D. The Contractor shall schedule the testing with the City at least 14 days prior to the test.
- E. During the demonstration, the bypass pumping equipment should be ready in case of system failure. Contractor shall be responsible for removal and proper disposal of any collected or residual water from the testing.

END OF SECTION

SECTION 13400

ELECTRICAL CONTROLS AND INSTRUMENTATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes control panels, power disconnect switches, control devices, terminal blocks and plastic raceway.

1.02 RELATED SECTIONS

- A. Section 16050 – Basis Electrical Material and Methods
- B. Section 16480 – Motor Control Centers

1.03 REFERENCES - CODES AND STANDARDS

- A. NECA (National Electrical Contractors Association) Standard of Installation
- B. NEMA ICS 1 (National Electrical Manufacturers Association) - Industrial Control and Systems: General Requirements.
- C. NEMA ICS 2 (National Electrical Manufacturers Association) - Industrial Control Devices, Controllers and Assemblies.
- D. NEMA ICS 4 (National Electrical Manufacturers Association) - Industrial Control and Systems: Terminal Blocks.
- E. NEMA ICS 5 (National Electrical Manufacturers Association) - Industrial Control and Systems: Control Circuit and Pilot Devices.
- F. NEMA ICS 6 (National Electrical Manufacturers Association) - Industrial Control and Systems: Enclosures.

1.04 SYSTEM DESCRIPTION

- A. The control section shall be part of the MCC and shall be complete with all devices for a complete system. Provide anti-condensation heater.
- B. The control section shall be furnished by the District's designated SCADA System Integrator as a completely wired and tested back-pan assembly, and installed and interconnected as part of the MCC by the MCC supplier.
- C. The Contractor shall engage the services of the District's designated SCADA System Integrator and ensure coordination with all trades

including the MCC supplier. No substitutions are allowed. The District's designated SCADA System Integrator is Calcon Systems, Inc., 12919 Alcosta Blvd., San Ramon, CA 94583. The phone number is (925) 277-0665.

1.05 SUBMITTALS

- A. In accordance with Division 1 Requirements.
- B. Shop Drawings: Comply with NEMA ICS 1 and submit control panel layouts, point-to-point wiring diagrams, interconnection wiring diagrams, dimensions, and support points, layout of completed assemblies, dimensions, weights, and external power requirements.
- C. Schematics: Provide complete elementary and schematic wiring diagrams with wires and terminal block numbered for all control systems. Show all internal and external devices and equipment, control panel devices, etc., in detail on the elementary diagram with all terminal points of such devices and equipment indicated.
- D. Product Data: Submit catalog data for each component being furnished showing control characteristics and connection requirements including supply voltage, frequency, electrical load, accuracy, and description of operation, operating instructions, and calibration procedure.
- E. O&M Manuals: Furnish manufacturer's installation, operation and maintenance manuals, bulletins, and spare parts lists.

1.06 CLOSEOUT SUBMITTALS

- A. In accordance with Division 1 Requirements.
- B. Project Record Documents: Include interconnection wire and cabling information.
- C. Operation and Maintenance Date: Submit bound copies of O&M manuals for each device, including instructions for adjustments and preventative maintenance.

1.07 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.08 COORDINATION

- A. Coordinate Work with installation of systems being controlled.

PART 2 - PRODUCTS

2.01 CONTROL SECTION OF MCC

- A. The control section shall be shop fabricated, complete with selector switches, indicating lights, wiring, terminal blocks, and plastic raceways, for a complete operating system.
 - 1. The control section shall be a section of the MCC.
 - 2. Provide interior rear panel for mounting electrical components.
 - 3. The completely wired and tested back-pan assembly shall be provided by the District's designated SCADA System Integrator as described in item 1.04 SYSTEM DESCRIPTION.
 - 4. Provide adequate space for conduit entry, termination of control cable, device wiring and raceway.
 - 5. Panel shall have a protective pouch to hold wiring diagrams.
 - 6. All other standard accessories and devices required for a fully functional system.

- B. Provide all necessary wiring and terminal blocks to connect the motor starter, auxiliary control devices, door mounted pilot devices, control relays, and accessories for a complete operating system.

2.02 LEVEL CONTROLLER

- A. Manufacturers:
 - 1. Pulsar Zenith 140 with DB10 transducer.

- B. Product Description: Non-contacting, ultrasonic level transducer and transmitter, with integral analog display. Suitable for use as transducer / transmitter for sensing devices.
 - 1. Range: 1 to 32 feet.
 - 2. Device Output: 4-20 mA into a 0 to 750 ohm load, proportional to level; scaled pulse with 100 ms pulse width adjustable to a maximum of 9,999 pulses/hr (maximum pulse rate selectable); alarm relay contact for either "Low Level" and "High Level".
 - 3. Power Supply: 120-volts AC, 12-volt-amp maximum consumption.
 - 4. Local display shall be an analog 0-100% linear indicator.
 - 5. Accuracy: +/- 2%, maximum. Calibration shall be unaffected by changes in barometric pressure.
 - 6. Housing: Transducer shall be housed in a PVC housing with a silicone rubber encapsulation; megaphone shall be flame retardant fiberglass; transmitter shall be equipped with a glass filled polycarbonate base, a polycarbonate cover and a coated steel-mounting bracket.
 - 7. All transducer cabling shall be one-piece coaxial cable, installed in a conduit, according to manufacturer specifications.

8. The Level Controller shall be mounted to the door of the control section and wired to the control system back-panel by the MCC supplier per the drawings provided by the District's SCADA System Integrator.

2.03 FLOAT AND LEVEL SWITCHES

- A. Manufacturers:
 1. Anchor Scientific - Type S
 2. Flygt - ENM-10
- B. Product Description:
 1. Liquid level sensing float-type switch, with restraint device to allow adjustment of contact elevation.
 2. All wetted parts of float shall be constructed from stainless steel or similar non-corrodible material, hermetically sealed and suitable for Class I, Division 1 hazardous environment.
 3. Sensing unit housing must be acceptable for mounting in a Class I, Div. 1 hazardous location.
 4. Operate in environment temperatures from -15 to +250 degrees Fahrenheit (-25 to 120°C).
 5. Switching actuator shall use a magnetic couple, such that the electrical contacts have no physical contact with the actual floatation device.
 6. Switch contacts shall be form A or B, as required.

2.04 INTRINSICALLY SAFE BARRIER

- A. Galvanic isolator or zener diode-based barrier to limit voltage and/or current on instrumentation circuits in areas where an explosion hazard exists. Allen Bradley, Phoenix Contact, R-K Electronics, or equal.

2.05 PUMP CONTROL SEQUENCE

- A. The sequence of operation will be programmed by the District's designated SCADA System Integrator.

2.06 TERMINAL BLOCKS

- A. Product Description: NEMA ICS 4 terminal blocks.

2.07 PLASTIC RACEWAY

- A. Product Description: Non-metallic plastic channel with hinged or snap-on cover, suitable for low voltage wiring.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install in accordance with NECA "Standard of Installation."
- B. Install enclosures and boxes plumb. Anchor securely to structural supports at each corner in accordance with Section 16050.
- C. Make electrical wiring interconnections.
- D. Install engraved plastic nameplates in accordance with Section 16050.
- E. Provide grounding and bonding of control panel and devices in accordance with Section 16050.

3.02 FIELD TESTING

- A. Each device shall be field tested. Field test results shall be recorded and submitted to the Owner for their records.

END OF SECTION

SECTION 15100

VALVES AND APPURTENANCES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Work included: This Section includes the supply and installation of valves and related equipment.
- B. Related work described elsewhere:
 - 1. Section 15200 - Piping Systems

1.02 QUALITY ASSURANCE

- A. Standards: The materials and work performed in this Section shall conform to the applicable standards of:
 - 1. The American National Standards Institute (ANSI).
 - 2. The American Society for Testing and Materials (ASTM).
 - 3. American Water Works Association Inc. (AWWA).
- B. Qualifications of manufacturers:
 - 1. The material shall be the product of a supplier regularly engaged in the manufacturing of pipe and plumbing products.
 - 2. All materials shall be new and of current manufacture and shall be guaranteed against defects of workmanship in accordance with the General Conditions.
- C. Qualification of installers:
 - 1. For the actual assembly, installation, and testing of the Work of this Section, uses only thoroughly trained and experienced personnel who are completely familiar with the requirements for this Work and with the installation recommendations of the manufacturers of the specified items.
 - 2. In acceptance or rejection of installed materials, no allowance will be made for lack of skill on the part of installers.

1.03 SUBMITTALS

- A. Shop drawings: In accordance with the provisions of Section 01330 of these Specifications, submit complete shop drawings including layouts, elevations and details.
- B. Material list: In accordance with the provisions of Section 01330 of the Specifications, submit with the shop drawings a complete list of all materials and equipment proposed to be furnished and installed under this portion of the work, giving manufacturer's name, catalog number, and catalog cuts for each item where applicable.
- C. Manufacturer's recommendations: Accompanying the materials list and shop drawings, submit copies of the manufacturers' current recommended method of installation.

1.04 PRODUCT HANDLING

- A. Use all means necessary to protect the materials of this Section before, during, and after installation and to protect the installed work and materials of all other trades.
- B. The Contractor shall provide and use proper implements, tools and facilities for the safe and proper handling and protection of the material.
- C. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner and at no additional cost to the Owner.
- D. When damaged material cannot be repaired to the satisfaction of the Owner, it shall be removed from the job.
- E. Material shall be stored in a safe location, protected from the elements where damage therefrom could result.

PART 2 - PRODUCTS

2.01 GENERAL

- A. These Specifications are intended to be standard specifications and they may therefore contain specifications for materials not required for this project or allowed on any or various parts of it. Certain materials, which are applicable for only one portion or a small portion, may be shown on the plans and not particularly specified herein.

- B. All materials shall conform to sizes, capacity, quality and quantities as shown on the drawings or described in these Specifications. Materials shall be from new stock, delivered in good condition, no damaged stock shall be used.
- C. Where no method of tests for materials is specified, the latest test specified by ASTM shall be followed.
- D. After delivery to the site, all materials shall be carefully unloaded, protected against breakage, rusting, and accumulation of foreign matter, disintegration and injury. The Contractor shall be responsible for all lost or damaged material supplied and work done under this contract.

2.02 BRASS AND BRONZE COMPONENTS

- A. Brass and bronze components of valves and appurtenances that have surfaces in contact with the water shall be alloys containing less than 16 percent zinc and 2 percent aluminum.
- B. Approved alloys are ASTM B61, B62, B98 (alloy A, B, or D), B139 (alloy A), B143 (alloy 1-B), B164, B194, B292 (alloy A), and B127.
- C. Stainless steel alloy 18-8 may be substituted for bronze at the option of the manufacturer and with the approval of the Owner.

2.03 EXTENSION STEMS

- A. Extension stems shall be Mueller Figure 1 or Figure 2 as indicated, Kennedy, or equal. Stem diameters shall be 1-1/4 inches unless otherwise shown. Stem guides shall be Mueller A26448, Kennedy, or equal. Guides shall be spaced such that the slenderness ratio of the stem body does not exceed 200.

2.04 VALVE BOXES

- A. Provide a valve box for each valve on buried piping. Valve boxes shall be of precast concrete of a size suitable for the valve on which it is to be used and shall be adjustable. Valve boxes shall be as manufactured by Santa Rosa Cast Products Company, Christy, or equal.

2.05 SWING CHECK VALVES

- A. Swing check valves shall be of the flanged type in full compliance with AWWA C-508-93 and MSS SP-71. Valves shall be supplied with external lever with weight or spring to assist closure. The pressure rating shall be 200.

- B. Valve bodies shall be of ASTM A-126 Class B cast iron. Flanges shall be in full compliance with ANSI B16.1 Class 125. Seats shall be constructed of ASTM B-62 bronze and be mechanically retained in the valve body.
- C. Disc shall be of cast iron ASTM A-126 Class B with mechanically secured bronze disc seat of ASTM B-62 material.
- D. The hinge shall be constructed of ductile iron ASTM B-536 Grade 65-45-12 with a stainless steel hinge pin. Packing shall be non-asbestos type and mechanically adjustable.
- E. Testing shall be performed in accordance with AWWA C-508-93 with the test results being furnished to the customer upon request.
- F. Flanged swing check valves shall be Series 800 as manufactured by Milliken Valve Company, or approved equal.

2.06 PVC BALL CHECK VALVES

- A. Ball check valves in PVC piping shall be Type I, Grade 1 PVC, ASTM D 1784, with true union connections, Vitron O-Ring and Teflon Seat, as manufactured by Chemtrol, Hills-McCanna, or equal.

2.07 BOLTS, GASKETS, GLANDS, NUTS

- A. Bolts, gaskets, glands, nuts, and miscellaneous accessories required to install all valves are to be furnished. Bolts for flanged connections shall be galvanized steel with American Standard regular unfinished square or hex heads. Nuts shall be galvanized steel with American Standard regular hexagonal dimensions. Gaskets for flanged connections shall be suitable for the pressure, temperature, and chemical characteristics of the fluid handled. The gasket materials shall also be suitable for the pipe system physical characteristics and materials. Gaskets shall extend from the inside diameter of the flange to at least the inside edge of the bolt holes or they may extend beyond the bolt circle. Jointing materials for mechanical joints shall conform to ANSI A21.11.

2.08 HOSE BIBB

- A. Hose Bibbs shall be copper alloy bronze with integral mounting flange, replaceable hexagonal disc, hose thread spout, with hand wheel, non-removable drainable hose connection vacuum breaker in conformance with ASSE 1011, and garden-hose threads complying with ASME B1.20.7 on outlet. Hose Bibbs shall be manufactured by NIBCO, Inc., Arrowhead Brass Products, Inc., or equal.

2.09 RUBBER WATER HOSE

- A. Provide 75 foot, water hose for each new hose bibb. Hose shall be suitable for water service and is to include double-braided rayon cord reinforcement with a working pressure of 150 psi. Couplings shall be cast brass (NHT) water hose couplings. Hose and couplings shall be as manufactured by Goodyear Utility Hose, Rainbird Corp., or equal.

2.10 PLUG VALVES

- A. Plug valves shall be of the non-lubricated eccentric type with an elastomer covering all seating surfaces. The elastomer shall be suitable for the service intended. Flanged valves shall be manufactured in accordance with ANSI B16.1 Class 125/150, including facing, drilling and flange thickness. Mechanical joint ends shall be in compliance with AWWA/ANSI C-111-92. Ports shall be round with a minimum of 81% port area.
- B. Valve bodies shall be of ASTM A-126 Class B cast iron in accordance with AWWA C-504-87 Section 5.2.1. Valves shall be furnished with a welded-in overlay seat of not less than 90% nickel in accordance with AWWA C-507-85 Section 3.2.3.5. Sprayed, plated or screwed-in seats are not acceptable.
- C. Plugs shall be of ASTM A-536 Grade 65-45-12 in compliance with AWWA C-504-87 Section 2.2.2. The plugs shall be of one piece solid construction with PTFE thrust bearings on the upper and lower bearing journals to reduce torque and prevent dirt and grit from entering the bearing and seal area.
- D. Valves shall be furnished with replaceable sleeve type bearings conforming to AWWA C-504-87 Section 3.6.1. and AWWA C-507-85 Section 3.2.4. Bearings shall be of sintered, oil impregnated type 316 stainless steel ASTM A-743 Grade CF-8M/ Valve shaft seals shall be of the "U" cup type in accordance with AWWA C-504-87 Section 3.7.2. Seals shall be self adjusting and repackable without removing the bonnet from the valve.
- E. Valves shall be given a hydrostatic and seat test with the test results being certified. Certified copies of Proof-of-Design test reports shall be furnished as outlined in AWWA C-504-87 Section 5.2.4.
- F. Plug valves shall be DeZurik PEC Eccentric Plug Valves as manufactured by DeZurik Water Controls Company, or approved equal.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Inspection:

1. Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
2. Verify that all materials may be installed in accordance with all pertinent codes and regulations, the original design, and the referenced standards.

B. Discrepancies:

1. In the event of discrepancy, immediately notify the Engineer.
2. Do not proceed with installation in area of discrepancy until all such discrepancies have been fully resolved.

3.02 INSTALLATION

A. General: Install all materials in strict accordance with the manufacturer's recommendations as approved by the Engineer.

B. Before installation, carefully clean valves of all foreign material, adjust stuffing boxes, and inspect valves in open and closed positions. Install valves in accordance with the applicable portions of these Specifications. Unless otherwise indicated, install valves with the stem vertical. Mount horizontal valves in such a manner that adequate clearance is provided for operation. Installation practices shall conform to manufacturer's recommendations.

C. Prior to installing flanged valves, the flange faces shall be thoroughly cleaned. After cleaning, insert the gasket and tighten the nuts progressively and uniformly. If flanges leak under pressure, loosen the nuts, reseal or replace the gasket, retighten the nuts, and retest the joint. Joints must be watertight at test pressures before acceptance.

D. Thoroughly clean threads of screwed joints by wire brushing, swabbing, or other approved method. Apply approved joint compound to threads prior to making joint. Joints shall be watertight at test pressures before acceptance.

E. Buried valve operators: Where valve operating nuts are buried 4 feet or more below finish grade, extension stems shall be installed to bring the operating nut within 6 inches of the surface.

- F. Valve boxes and extension sleeves shall be provided for all buried valve operators. Valve operators shall be the buried type unless otherwise shown or specified.
- G. Anchor bolts: Anchor bolts shall be used for floor stands, stem guides, etc., and shall be cast in place during concrete placement. Threads shall be protected and shall be cleaned before the nuts are attached and tightened.
- H. Buried valves shall have a loose polyethylene encasement.

3.03 TESTS

- A. General: Upon completion of this portion of the Work, and prior to it acceptance by the Owner, make all required tests and secure all required approvals from agencies having jurisdiction.
- B. Testing: Valves and related materials will be tested in accordance with Section 15200 -Piping System, at the same time that the adjacent pipeline is tested. Joints shall show no visible leakage under test. Repair joints that show signs of leakage prior to final acceptance. If there are any special parts of control systems or operators that might be damaged by the pipeline test, they shall be properly protected. The Contractor will be held responsible for any damage caused by the testing.

3.04 PROTECTIVE COATINGS

- A. Prior to acceptance, thoroughly clean all materials contained herein and paint in accordance with Section 09800 - Protective Coatings.

3.05 INSTRUCTIONS

- A. Instruction of Owner's personnel shall be in accordance with manufacturer's recommendations.

3.06 SCHEDULE

SEWER VALVE SCHEDULE

Tag	Size	Type
PV-101	6"	Plug Valve
PV-102	6"	Plug Valve
PV-103	6"	Plug Valve
PV-104	6"	Plug Valve
CV-101	6"	Swing Check Valve
CV-102	6"	Swing Check Valve
CV-103	6"	Swing Check Valve

END OF SECTION

SECTION 15200
PIPING SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section includes the supply and installation, but is not necessarily limited to:
 - 1. Storm drain pipe
 - 2. Water pipe and fittings
 - 3. Sanitary sewer pipe and fittings
 - 4. Force main pipe and fittings
 - 5. All other piping items indicated on the Plans, specified herein, or needed for a complete and proper piping installation in accordance with all pertinent codes and regulations.

- B. Related work described elsewhere:
 - 1. Section 02315 - Excavation and Backfill.
 - 2. Section 02250 - Shoring and Trench Safety
 - 3. Section 09800 – Protective Coatings
 - 4. Section 15100 - Valves and Appurtenances

1.02 QUALITY ASSURANCE

- A. Standards: The materials and work performed in this Section shall conform to the applicable standards of:
 - 1. The American National Standards Institute (ANSI).
 - 2. The American Society for Testing and Materials (ASTM).
 - 3. American Water Works Association Inc. (AWWA).

4. The American Society of Mechanical Engineers, Boiler and Pressure Vessel Code (ASME).
 5. Plumbing and Drainage Institute (PDI).
 6. Underwriters Laboratories Inc. (UL).
 7. Uniform Plumbing Code (UPC).
- B. Qualification of manufacturers:
1. The material shall be the product of a supplier regularly engaged in the manufacturing of pipe and plumbing products.
 2. All materials shall be new and of current manufacture and shall be guaranteed against defects or workmanship in accordance with the General Conditions.

1.03 SUBMITTALS

- A. Material list: In accordance with the provisions of Section 01330 of the specifications, submit with the shop drawings a complete list of all materials and equipment proposed to be furnished and installed under this portion of the work, giving manufacturer's name, catalog number, and catalog cuts for each item where applicable.

PART 2 - PRODUCTS

2.01 GENERAL

- A. These Specifications are intended to be standard specifications and they may therefore contain specifications for materials not required for this project or allowed on any or various parts of it. Certain materials, which are applicable for only one portion or a small portion, may be shown on the plans and not particularly specified herein.
- B. All materials shall conform to sizes, capacity, quality and quantities as shown on the drawings or described in these Specifications. Materials shall be from new stock, delivered in good condition. No damage to stock shall be used.
- C. Where no method of tests for materials is specified, the latest applicable test specified by ASTM shall be followed.

- D. After delivery to the site, all materials shall be carefully unloaded, protected against breakage, rusting, accumulation of foreign matter, disintegration and injury. The Contractor shall be responsible for all lost or damaged material supplied and work done under this contract.
- E. Thrust blocks shall be placed at all buried valves, bends, caps or plugs, fittings, reducers, and increasers.

2.02 DUCTILE IRON PIPE (DIP)

- A. Where indicated on the drawings, cast iron pipe shall be interpreted to mean ductile iron pipe.
- B. Ductile iron pipe will be designed in accordance with Marina Coast Water District Standard Specifications, Section 15056.
- C. The exterior surface of ductile iron pipe and fittings shall have a factory-applied protective coating in accordance with Section 09800, Protective Coatings.
- D. Thrust restraint for DIP shall be with EBAA Megalug locking gaskets or approved equal.

2.03 C900 PVC

- A. Polyvinyl chloride (PVC) pipe, 4 inch through 12 inch, shall conform to the requirements of ANSI/AWWA C900-97 and ASTM D 3034.
- B. Material for PVC pipe shall conform to the requirements of ASTM D 1784 for Class 12454-B or 12454-C as defined therein.
- C. Flexible rubber rings for elastomeric gasket joints for PVC pipe and fittings shall conform to the requirements of ASTM D 1869.
- D. All fittings PVC pipe shall be ductile iron mechanical joint fittings in accordance with Marina Coast Water District Standard Specifications, Section 15056.
- E. The strength class of the fittings shall be not less than the strength class of any adjoining pipe.

2.04 PVC SCHEDULE 80

- A. PVC pipe 1/2 inch through 4 inch shall be Type 1, Grade 1 or Class 12454-B, conforming to ASTM D1784 and ASTM D1785. Pipe shall be Schedule 80 unless specifically called out otherwise on the Plans.

- B. Fittings shall be Schedule 80 conforming to ASTM D2467 or ASTM D2464.
- C. Joints shall be solvent welded per ASTM 2855.
- D. Flanges shall be drilled with a pattern suitable for the connected equipment.

2.05 POLYETHYLENE TUBING

- A. Polyethylene tubing shall be size as shown, capable of withstanding 190 psig at 175 degrees F. Tubing shall be Dekoron Type P instrument tubing, Parker Hannifin, or equal. Run tubing in conduit. Compression-type fittings shall be used for connections. No fittings shall be permitted inside conduits.

2.05 GALVANIZED STEEL PIPE (GSP)

- A. Galvanized steel pipe shall be Schedule 40, ASTM A120, Grade A with galvanized 150 pound malleable iron screwed fittings meeting ASTM A197 with dimensions conforming to ANSI B16.3. Unions shall be 300 pound galvanized malleable iron meeting ASTM A197, dimensions conforming to ANSI B16.9.

2.06 FLEXIBLE COUPLINGS

- A. Flexible couplings shall be sleeve type flexible couplings and approved by the Engineer. Size shall be compatible to the outside diameter of the pipes on which the flexible coupling is installed as shown on the Plans. In many instances the flexible couplings are used to attach pipes of different materials and different outside diameters. Thrust ties shall be installed when called out on the Plans and shall be designed and installed in accordance with the AWWA Manual for Steel Piping or clamp-type restraining rings. The thrust ties shall be designed for the test pressure as specified. Lengths for flexible couplings shall be the standard length unless otherwise shown on the Plans. Couplings shall have fusion epoxy coating with stainless steel nuts and bolts. Flexible couplings shall be as manufactured by Romac, or equal.
- B. Pipe restraint clamps shall be Romac Style 611 Pipe Restraint Clamp, or approved equal. The Romac Style 611 Pipe Restraint Clamp for 12-inch pipe consists of two pipe clams and four restraining rods. Use only one pipe clamp per coupling on the ductile iron side. Restraining rods shall be replaced with tie rods.

2.07 BOLTS FOR UNDERGROUND PVC PIPE

- A. Bolts and nuts for underground connections shall be 316 stainless steel, ASTM A 193, Grade 138M hex head with ASTM A 194, Grade 8M hex nuts. Plastic washers and sleeves for dielectric joints shall be provided.

2.08 CONCRETE FOR THRUST BLOCKING

- A. The materials used for concrete for thrust blocking shall conform to the requirements specified in Section 03050 and shall be sized and located as indicated on the Plans. The proportions and mix design shall be such that the concrete will develop a minimum compressive field strength of 2,000 psi at 28 days.

2.09 PIPE LOCATING TAPE

- A. Detectable pipe locating tape shall consist of solid aluminum foil encased in a protective high visibility, inert polyethylene plastic jacket, and shall be used for non-metallic pipes. Non-detectable warning tape shall be used for all metallic pipes. For detectable tape, foil is to be visible on the unprinted side. Minimum overall thickness shall be 5.5 mils. Tape width shall be 6 inches. Tape color and lettering shall be in accordance with the APWA Uniform Color Code for Marking of Underground Utility Locations. The identifying lettering shall be a minimum of 1-inch high permanent black lettering imprinted continuously over the entire length. The tape shall be Terra "D" as manufactured by Reef Industries, Allen Detectatape, or equal.

2.10 PVC PIPE (SDR 35)

- A. This Specification designates General Requirements for unclassified Polyvinyl chloride (PVC) plastic gravity sewer pipe with integral wall, bell and spigot joints for the conveyance of domestic sewage and stormwater.
- B. Pipe and fittings shall meet wall and strength minimums necessary to provide a pipe stiffness of 46 psi, and the requirements of ASTM Specifications D3034, latest revision.
- C. Joints shall be equipped with rubber rings. The bell shall consist of an integral wall section with a solid cross section rubber ring factory assembled, securely locked in place to prevent displacement. Rubber rings shall meet the requirements of ASTM F477.
- D. All fittings and accessories shall be as manufactured and furnished by the pipe supplier and have bell and/or space configurations identical to that of the pipe.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

- A. Inspection:
 - 1. Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
 - 2. Verify that all pipe may be installed in accordance with all pertinent codes and regulations, the original design, and the referenced standards.
- B. Discrepancies:
 - 1. In the event of discrepancy, immediately notify the Engineer.
 - 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 HANDLING

- A. The Contractor shall provide and use proper implements, tools and facilities for the safe and proper handling and protection of the pipe, all as recommended by the manufacturer. Pipe shall be handled in such a manner as to avoid damage to the pipe material or any coating and especially to the ends.
- B. When damaged pipe cannot be repaired to the satisfaction of the City, it shall be removed from the job.
- C. Pipe shall be stored in a safe location, protected from the elements where damage therefrom could result.
- D. The pipe shall be carefully lowered in the trench to prevent damage. Under no circumstances shall pipe be dropped or dumped into trenches. Remove foreign matter and dirt from the inside of the pipe and keep it clean during and after laying.
- E. The Contractor shall take care to keep from damaging the pipe by heavy loads and unnecessary compactive effort especially for shallow lifts. All damaged pipe shall be replaced. Normally, repairs will not be acceptable.

3.03 INSTALLATION

- A. General: Install all pipes in strict accordance with plans, profiles, typical sections and with manufacturers' recommendations as approved by the Engineer.
- B. Pressure pipe: Pressure pipe shall be laid in accordance with plans and profiles and typical sections. Before new pipe is placed the subgrade material shall be graded so that pipe will rest firmly on undisturbed granular material for its full length.

All adjustments to line and grade shall be made by scraping away or filling in the bedding to the body of the pipe and in no case by wedging a blocking. Pipe shall be laid on an unyielding foundation to proper line and grade with uniform bearing under the full length of the pipe with slight hand excavation for the coupling to allow for its thickness.

- 1. Where soft, wet or spongy conditions are encountered in the trench at pipe subgrade, this foundation situation shall be corrected by the use of imported drain rock and geotextile fabric as specified in Section 02315.
 - 2. All pipe, especially the ends, shall be carefully cleaned before the pipe is joined. Whenever work ceases for any reason, the end of the pipe shall be closed with a watertight fitting, plug or cover. The interior of the pipe shall be kept free from dirt, foreign material or debris as the work progresses and the pipe shall be cleaned after completion.
 - 3. Pressure line shall be laid to the line and grade shown on the plans. In instances where grade shows constant uphill grade to structures or air relief valve, the Contractor shall take all precautions necessary to secure continual smooth alignment to such appurtenances.
- C. Gravity pipe: Before any pipe is placed, the subgrade material shall be graded so that the pipe will rest firmly on undisturbed granular material for its full length.

All adjustments to line and grade shall be made by scraping away or filling in the bedding under the body of the pipe, and in no case by wedging or blocking. Pipe shall be laid on an unyielding foundation true to line and grade with uniform bearing under the full length of the pipe with slight hand excavation at the coupling to allow for its thickness.

Where soft, wet or spongy conditions are encountered in the trench at pipe subgrade, the subgrade shall be over-excavated and stabilized by placing imported drain rock and geotextile fabric as specified in Section 02315.

All pipe, especially the ends, shall be carefully cleaned before the pipe is joined. Whenever work ceases for any reason, the end of the pipe shall be closed with a watertight fitting, plug or cover. The interior of the pipe shall be kept free from dirt, foreign material or debris as the work progresses and the pipe shall be cleaned after completion.

All pipe shall be laid and maintained to the required line and grade. Contractor shall set up a grade device parallel to the trench and the cut carefully measured to the pipe. If a laser device is used, it shall be checked periodically and verified for accuracy by measurement from engineered cut stakes.

Special care shall be taken to maintain grade, especially on flatter sections of 1% or less. Alignment shall be uniform and true and subject to approval by the engineer. No dead flat or reverse grades will be allowed.

Where specific items are not covered within this Specification, reference shall be made to manufacturer's suggested specifications and installation guides.

3.04 PROTECTION, BARRICADES, ETC.

- A. Pipe strung out along the trench or stored where it can be damaged or where injury may result to the public or employees shall have special precautions taken to prevent damage from occurring. Pipe shall not be spread along trenches for extended periods prior to its actual use. Pipe shall be stored in a safe location out of the traveled way and properly barricaded with suitable lights provided to prevent vehicular damage.
- B. Where pipe is stored off of a right-of-way, the Contractor shall be required to obtain a letter of consent from the affected property owner prior to storage in such locations. Such letters shall be obtained and given to the Engineer prior to use of private property.

3.05 LAYING, BEDDING

- A. All buried pipe shall be laid on a prepared bed as hereinbefore specified. After laying, additional bedding material shall be added to a depth of 3-inches or about the mid-point of the pipe depending upon diameter, after which it shall be tamped with a suitable tool to secure uniform full-length bedding up to the mid-point of the pipe. Additional bedding material shall

then be placed to the depth shown in the standard details of the Plans and compacted by mechanical methods to the specified relative compaction.

- B. Take necessary precautions to prevent uplift and floating of the pipe prior to backfilling.
- C. Spigot end of pipe shall be laid in direction of normal flow.
- D. Water in trenches shall be removed by pumping and not allowed to flow through the pipe.

3.06 CUTTING PIPE

- A. General: Cut pipe for inserting valves, fittings, closure pieces, and as otherwise required, in a neat and workmanlike manner without damaging the pipe or lining and so as to leave a smooth end at right angles to the axis of the pipe.
- B. Cast iron and ductile iron pipe: Cut pipe with milling-type cutter, rolling pipe cutter, abrasive saw cutter, or with sledge and cold cutter. Do not flame cut.
- C. Dressing cut ends:
 - 1. Dress cut ends of pipe in accordance with the type of joint to be made.
 - 2. Dress cut ends of mechanical joint pipe to remove sharp edges or projections which may damage the rubber gasket.
 - 3. Dress cut ends of push-on joint pipe by beveling, as recommended by the coupling or adapter manufacturer.

3.07 APPURTENANCES

- A. General: See plans for location of valves and appurtenances to be installed as a portion of the pipe. The Contractor should note that generally, valves that are clustered are flanged by hub with the entire cluster properly bolted together. Valves and other appurtenances having hub ends shall be connected to the pipe by means of rubber rings of the same type used to join the pipe.
- B. Thrust Blocks: Thrust blocking shall be provided at all valves, bends, tees, crosses and reducers. Thrust block shall be constructed in accordance with standards shown on the Plans and as specified in Section 03050.

Ground against which the concrete is being placed shall be moistened (if needed) prior to placing so that it will not absorb excessive moisture from the fresh concrete. Forms where required shall be smooth and tight of sufficient strength to maintain their shape during placing of the concrete. Placing methods shall be such that the concrete will be placed in its final position without segregation. All concrete shall be rodded in place to insure smooth surfaces along form lines. Blocking shall be placed against undisturbed earth in such manner that pipe and fitting joints or valves will be accessible for repair. The relative area of thrust block required for various pressures and degrees of earth restraint are noted on the plans. Where poor soil and higher pressures are encountered, greater area of thrust block may be required.

- C. Joining Push-on Joint Pipe: Join pipe with push-on type joints in accordance with the manufacturer's recommendations as approved by the Engineer. Provide all special tools and devices, such as special jacks, chokers, and similar items required for the installation. Lubricant for the pipe gaskets shall be furnished by the pipe manufacturer, and no substitutes will be permitted.
- D. Joining Flanged Joint Pipe: Prior to connecting flanged pipe, the faces of the flanges shall be thoroughly cleaned of all oil, grease, and foreign material. The rubber gaskets shall be checked for proper fit and thoroughly cleaned. Care shall be taken to assure proper seating of the flanged gasket. Bolts shall be tightened so that the pressure on the gasket is uniform. Torque-limiting wrenches shall be used to insure uniform bearing insofar as possible. If joints leak when the hydrostatic test is applied, the gaskets shall be removed and reset and bolts re-tightened.
- E. Pipeline connections to structures shall have approved watertight plugs as shown on the Plans.
- F. Flexible Joints: At each pipeline connection to a structure, the Contractor shall place a flexible joint located not more than one foot from the outside wall of the structure. The Contractor shall install such odd lengths as are necessary in laying the pipe to accomplish this result during the original installation.

3.08 CLEANING

- A. Care shall be taken to keep the pipe clean at all times during the installation. Prior to testing the pipe shall be flushed so that the velocities of 5 feet per second are obtained sufficient to clean the entire length of pipe.

- B. If the Contractor digs out any sections subsequent to this where debris could enter the line, the line shall be again flushed through the section that was disturbed.

3.09 TESTS

- A. General: Upon completion of this portion of the work, and prior to its acceptance by the Owner, make all required tests and secure all required approvals from agencies having jurisdiction.

- B. Hydrostatic testing:

- 1. General: Conduct pressure and leakage tests on all pipelines. Furnish all necessary equipment and material and make all taps in the pipe as required. All pipe testing is to be hydrostatic.

Furnish the following equipment and materials for the tests:

Amount	Description
2	Approved graduated containers
2	Approved pressure gauges
1	Hydraulic force pump with suitable hose and suction pipe as required

Conduct the tests on buried pipe after the trench has been completely backfilled. The Contractor may, if field conditions permit, partially backfill the trench and leave the joints open for inspection and conduct an initial test. The acceptance test shall not, however, be conducted until all backfilling has been completed. Conduct the tests on exposed piping after the piping has been completely installed, including all supports and hangers.

- 2. Pressure Pipe Procedure: After the pipe has been laid and backfilled and final compaction has been obtained, the Contractor shall test pressure pipe between each valve section or pipe run. The pipe shall be slowly filled with water so that air is removed and the pipe shall be tested hydrostatically for a minimum of one hour. Reaction blocking pipe restraints and the like shall be installed prior to test.

All exposed pipe, fittings, valves and joints shall be examined during the test for seepage or other defects. Defects noted by this test shall be removed and replaced by the Contractor with sound material. Afterwards, the test shall be repeated to the satisfaction of the Engineer.

In addition, a leakage test shall be conducted after the pressure test has been satisfactorily completed. The duration of each leakage test shall be two hours and during the test the main shall be subjected to a pressure of 100 psi. Leakage shall not exceed that as shown in Table 3 of AWWA Standard C600-64 or not in excess of 10 gallons per day per inch diameter per mile, whichever is less.

If any test discloses leakage greater than specified, the Contractor shall at his own expense locate and repair the defective joints until the leakage is within the specified allowance.

3. The separate pressure and leakage tests described above for pressure pipe may be combined into one test by testing the pipe hydrostatically to a pressure of 200 psi for a minimum of two hours while completing all inspections and testing required above for seepage, defects and leakage.
4. Requirements for Exposed Pipelines: All exposed pipelines shall have no visible leakage during the specified test period. Any exposed pipeline with leakage shall be repaired or replaced.
5. Gravity Pipe Procedure:
 - a. Test gravity flow pipelines in accordance with Marina Coast Water District Standards.

3.10 REPAIRS

- A. Only new pipe free from defects shall be installed. Portions of broken pipe or short lengths may be used providing they are properly cut back and used as stubs, or short lengths required at structures for flexible joints.
- B. Broken or leaking sections of pipe must be replaced. Repair clamps will not be approved.

3.11 DISINFECTION OF POTABLE WATER LINES

- A. After preliminary purging of the system and before being placed in service, all the potable water lines shall be chlorinated in accordance with the latest revision of AWWA C651, Standards for Disinfecting Water Mains. Chlorine shall be applied using liquid chlorine, gas-water mixture, fed-chlorine gas, or calcium hypochlorite water mixture, unless another method is approved by the DISTRICT. The chlorinating agent shall be applied at the beginning of each section adjacent to the feeder connection and shall be injected through a corporation cock, hydrant, or other

connection ensuring treatment to the entire line. Water shall be fed slowly into the line with chlorine applied in amounts to produce a dosage of 25 parts per million. A residual of not less than 10 parts per million shall be produced in all parts of the line for a 24-hour period. During the chlorination process, all valves shall be operated, and remain open, except at ends of section.

- B. After chlorination, the water shall be flushed from the lines until water at the extremities has a residual of not more than 0.1 parts per million. Any water flushed from the pipe lines shall be dechlorinated prior to flushing or containment.
- C. Bacteriological samples will not be taken until a satisfactory hydrostatic pressure and leakage test is completed. Water samples for the disinfected pipelines shall be taken by the CONTRACTOR in the presence of DISTRICT's representative, and samples shall be tested by the DISTRICT's laboratory at the CONTRACTOR's expense. If bacteriological samples fail to satisfy minimum requirements, additional chlorination shall be required at the expense of the CONTRACTOR until satisfactory samples are obtained. No bacteriological samples shall be taken from fire hydrants. If necessary, the CONTRACTOR shall provide, at his or her expense, an outlet from which to take the samples.
- D. All new water mains, service connections and appurtenances that passes the hydrostatic pressure and leakage test and disinfection shall be issued a letter by the CONSTRUCTION MANAGER. This certification shall be a prerequisite for the permanent connection or tie-in of the new water main to the existing system.

3.12 FINAL CLEANING

- A. Prior to final acceptance, all pipelines installed under this Section shall be flushed out and all accumulated construction debris and other foreign matter removed. Cleaning shall be done in a manner that will keep flushed debris from entering equipment and in a manner approved by the City

3.13 SCHEDULE

Service	Size Range	Buried		Aboveground or Inside Underground Vaults		Test Pressure (psig)
		Pipe Type	Joint Type	Pipe Type	Joint Type	
Pump Discharge / SSFM	6-inch, 10-inch	DIP	Push-on restrained	DIP	Flanged	100
SS	16-inch	DIP	Push-on	N/A	N/A	*
Drain	6-inch	DIP	Flanged	DIP	Flanged	*
Drain	4-inch	PVC C900	Bell/Spigot	N/A	N/A	*
W	2-inch	PVC SCH 80	Solvent Weld	GSP	Threaded	100

*Indicates Gravity Pipe

END OF SECTION

SECTION 16050

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes grounding electrodes and conductors; equipment grounding conductors; bonding methods and materials; conduit and equipment supports; anchors and fasteners; nameplates and labels; wire markers; underground warning tape; sealing and fireproofing of sleeves and openings between conduits and wall.

1.02 REFERENCES - CODES AND STANDARDS

- A. ASTM B 187 Specifications for Copper Bus, Rod, and Shapes.
- B. UL 467 Electrical Grounding and Bonding Equipment.
- C. IEEE 142 (Institute of Electrical and Electronics Engineers) - Recommended Practice for Grounding of Industrial and Commercial Power Systems.
- D. IEEE 1100 Recommended Practice for Powering and Grounding Electronic Equipment.
- E. NECA (National Electrical Contractors Association) – Standard of Installation.
- F. NETA ATS (International Electrical Testing Association) – Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- G. NFPA 70 National Electrical Code (NEC). Latest approved edition.

1.03 SYSTEM DESCRIPTION

- A. Grounding electrode system consist of the following elements:
 - 1. Rod electrodes
 - 2. Service equipment
 - 3. Enclosures
 - 4. Separately derived systems.

- B. Anchor and fasten electrical products to building elements and finishes as follows:
 - 1. Concrete Structural Elements: Provide preset inserts.
 - 2. Concrete Surfaces: Provide expansion anchors.
 - 3. Interior Structural Steel: Provide appropriate size beam clamps.
 - 4. Solid Masonry Walls: Use expansion anchors and preset inserts.
 - 5. Sheet Metal: Provide sheet metal screws.

- C. Identify electrical components as follows:
 - 1. Nameplate for each electrical distribution and control equipment enclosure.
 - 2. Label for identification of individual wall switches and receptacles, control device stations, and equipment.
 - 3. Wire marker for each conductor at panelboard gutters; pull boxes; and each load connection.
 - 4. Underground warning tape along length of each underground raceway or cable.

1.04 DESIGN REQUIREMENTS

- A. Furnish products listed and classified by Underwriters Laboratories, Inc. (UL), Electrical Testing Laboratories, Inc. (ETL), or other recognized, acceptable testing and listing agencies as suitable for purpose specified and shown.

- B. Grounding shall be in accordance with the National Electrical Code (NEC). Where size, type, rating and quantities indicated or specified are in excess of NEC requirements, the more stringent requirements and the greater size, rating, and quantity indications govern.

- C. Select materials, sizes, and types of anchors, fasteners, and supports to carry at least twice the loads of equipment and raceway, including weight of wire and cable in raceway.

1.05 SUBMITTALS

- A. In accordance with Division 1 requirements.

- B. Product Data: Submit grounding electrodes and connections for fastening components and nameplates, labels, and markers.

- C. Test Report: Measure overall resistance to ground. Provide certified test report for Engineer's Review.

1.06 CLOSEOUT SUBMITTALS

- A. In accordance with Division 1 requirements.
- B. Project Record Documents: Record actual locations of components and grounding electrodes.

1.07 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years' experience.
- B. Installer: A firm with at least five years of successful installation experience on projects with electrical grounding work similar to that required for this project.

1.08 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.01 GROUNDING SYSTEM

- A. Except as otherwise indicated, provide for each electrical grounding indicated, an assembly of materials, including, but not necessarily limited to, cable/wire, connectors, terminals (solderless lugs), grounding rods/electrodes, bonding jumper braid, and other items and accessories needed for a complete installation. Where more than one type meets indicated requirements, selection is Installer's option. Where materials or components are not otherwise indicated, provide products as recommended by the accessories manufacturers and in compliance with the NEC, and established industry standards.
- B. All grounding materials required shall be furnished new and undamaged in accordance with the following requirements:

2.02 WIRE

- A. Service Equipment Grounding Electrode Conductor: Bare, soft-drawn copper, Class AA stranding, ASTM B 8. Size per the NEC, Article 250, unless otherwise noted.

- B. Electrical Equipment Grounding Conductor: Insulated, soft-drawn copper, Class B stranding or solid, with green-colored polyvinyl chloride insulation, UL 83, sized according to the NEC, unless otherwise noted.

2.03 MECHANICAL CONNECTORS

- A. Description: Bolt-on bronze connectors, suitable for grounding and bonding applications in configurations required for the particular installation.
- B. Manufacturer
 - 1. Burndy Corp.
 - 2. Anderson
 - 3. Thomas & Betts
 - 4. 3-M Co.

2.04 EXOTHERMIC CONNECTIONS

- A. Product Description: Exothermic materials, accessories, and tools for preparing and making permanent field connections between grounding system components. Molds, cartridges, materials, and accessories as recommended by the manufacturer of the molds for the items to be welded.
- B. Manufacturer:
 - 1. Cadweld (Erico Products) "Exolon" Low Emission or acceptable equal. Molds and powder shall be furnished by the same manufacturer.

2.05 FLEXIBLE JUMPER STRAP

- A. Flexible flat conductor, 480 strands of 30-gauge, bare copper wire; 3/4-inch width, 9-1/2-inch-long; 48.25 kcmil, minimum. Protect braid with copper bolt-hole ends with holes sized for 3/8-inch diameter bolts.

2.7 ROD ELECTRODES

- A. Material: Copper
- B. Diameter: 5/8-inch (16 mm)
- C. Length: 10 feet (3,000 mm)

2.8 GROUNDING WELL COMPONENTS

- A. Well Pipe: 8 inches NPS (DN200) by maximum 12 inches (300-mm) long, concrete or fiberglass pipe with belled end.
- B. Well Cover: Cast iron with legend "GROUND" embossed on cover.

2.9 ANCHORS AND FASTENERS

- A. Materials and Finishes: Corrosion resistant, Heavy-duty expansion type.

2.10 FORMED STEEL CHANNEL

- A. Description: Galvanized steel.

2.11 NAMEPLATES AND LABELS

- A. Nameplates: Engraved three-layer laminated plastic, white letters on black background.
- B. Letter Size:
 - 1. 1/8-inch (3 mm) letters for identifying individual equipment and loads.
 - 2. 1/4-inch (6 mm) letters for identifying grouped equipment and loads.
- C. Labels: Embossed adhesive tape, with 3/16-inch white letters on black background.

2.12 WIRE MARKERS

- A. Description: Vinyl cloth tape, split sleeve, or tubing-type, pre-printed wire markers.
- B. Legend:
 - 1. Power Circuits: Branch circuit or feeder number as indicated on Drawings.
 - 2. Control Circuits: Control wire number as indicated on shop drawings.

2.13 UNDERGROUND WARNING TAPE

- A. Description: 3-inch (100 mm) minimum width, 5 mil thickness, foil bonded polyethylene tape, detectable type, yellow color with suitable continuous warning legend describing buried electrical lines.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that final backfill and compaction have been completed before driving rod electrodes.
- B. Verify that abandoned wiring and equipment serve only abandoned facilities.

3.02 EXISTING WORK

- A. Modify existing grounding system to maintain continuity to accommodate renovations.
- B. Extend existing grounding system using materials and methods as specified.
- C. Install temporary wiring and connections to maintain existing systems in service during construction.
- D. Perform work on energized equipment or circuits with experienced and trained personnel following all safety rules and procedures.
- E. Remove, relocate, and extend existing installations to accommodate new construction.
- F. Repair adjacent construction and finishes that were damaged during demolition and extension work.
- G. Remove exposed abandoned grounding and bonding components, fasteners, supports and electrical identification components. Cut embedded support elements below surface of walls and floors. Patch surfaces damaged by removal of existing components to match surrounding finishes.

3.03 GROUNDING AND BONDING INSTALLATION:

- A. Verify that final backfill and compaction has been completed before driving rod electrodes.
- B. Installation:
 - 1. Remove paint, rust, mill-oils, and surface contaminants at connection points.
 - 2. Install grounding well pipe with cover at rod locations as indicated on Drawings. Install well pipes top flush with finished grade.

3. Install grounding electrode conductor and connect to reinforcing steel in slab or foundation.
4. Bond together metal siding not attached to grounded structure; bond to ground.
5. Bond together reinforcing steel and metal accessories.
6. Bond together each metallic raceway, pipe, duct and other metal object entering enclosures and exiting slabs. Install minimum # 12 AWG bare copper conductor.
7. Install isolated grounding conductor for circuits supplying electronic equipment in accordance with IEEE 1100.
8. Equipment Grounding Conductor: Install separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.
9. Connect to site grounding system.
10. Bond to lightning protection system.
11. Install continuous grounding using underground cold water system and building steel as grounding electrode. Where water piping is not available, install artificial station ground by means of driven rods or buried electrodes.
12. Install grounding and bonding in patient care areas to meet requirements of NFPA 99.
13. Permanently ground entire light and power system in accordance with NEC, including service equipment, distribution panels, lighting panel boards, switch and starter enclosures, motor frames, grounding type receptacles, and other exposed non-current carrying metal parts of electrical equipment.
14. Install branch circuits feeding isolated ground receptacles with separate insulated grounding conductor, connected only at isolated ground receptacle, ground terminals, and at ground bus of serving panel.
15. Accomplish grounding of electrical system by using insulated grounding conductor installed with feeders and branch circuit conductors in conduits. Size grounding conductors in accordance with NEC. Install from grounding bus of serving panel to ground bus of served panel, grounding screw of receptacles, lighting fixture housing, light switch outlet boxes or metal enclosures of service

equipment. Ground conduits by means of grounding bushings on terminations at panel boards with installed # 12 AWG conductor to grounding bus.

16. Grounding electrical system using continuous metal raceway system enclosing circuit conductors in accordance with NEC.
17. Permanently attach equipment and grounding conductors prior to energizing equipment.

3.04 GROUND CONDUCTORS

- A. Grounding conductors shall be located and connected as indicated on drawings.
- B. Ground conductors under buildings or structures shall be buried with at least 6 inches of earth cover. Buried grounding conductors extending beyond the foundations of buildings or structures shall have at least 18 inches of earth cover.
- C. Exposed conductors shall be installed inconspicuously in vertical or horizontal positions on supporting structures. When located on irregular supporting surfaces or equipment, the conductors shall run parallel to or normal to dominant surfaces.
- D. Conductors routed over concrete, steel, or equipment surfaces shall be kept in close contact with those surfaces by using fasteners located at intervals not to exceed 3 feet.
- E. Conductors passing through floor slabs shall be installed in conduit sleeves that extend above the floor slab, a minimum of 1-1/2 inches to provide protection. Sleeves shall be sealed to maintain fireproof integrity.
- F. Provide isolated grounding conductor for circuits supplying equipment and systems as shown on the drawings.
- G. Provide a separate equipment-grounding conductor for low voltage distribution systems, single or three phase feeder circuit and each branch circuit with single or three phase protective devices. Install a grounding conductor in conduit with phase and neutral conductors. Single-phase branch circuits for 120 and 277 volt lighting, receptacles, and motors shall have a phase, neutral, and ground conductors installed in the common conduit. Provide suitable bonding jumpers and approved grounding type bushings for flexible conduits used for equipment connection utilized in conjunction with the above branch circuits with. Single-phase circuits for equipment and all branch circuits installed in non-metallic or flexible conduits shall be provided with a separate grounding conductor.

- H. Ground the neutral of the various transformers of separately derived systems with a bare copper conductor, installed in conduit, from the neutral directly to the building interior cold water pipe or nearest solidly grounded structural reinforcing steel, in accordance with the provisions of NEC Article 250-24. Use bolted accessible connections to the ground system so that the neutral ground can be disconnected for test. Ground the system ground conduit as detailed on drawing. Size the grounding electrode conductors in accordance with the NEC, Table 250-66, or as indicated.

3.05 CONNECTIONS

- A. All connections shall be made by the exothermic welding process, except where otherwise indicated on the drawings or in these specifications. The manufacturer's instructions on the use of exothermic welding materials shall be followed in all details. All surfaces to be joined by the welds shall be thoroughly cleaned. Paint, scale, and other deleterious substances shall be removed from surfaces of ungalvanized structural steel members by grinding. Galvanized steel surfaces shall be cleaned with emery paper. Powder and molds shall be kept dry and warm until used. Worn or damaged molds shall not be used.
- B. All exothermic welded connections shall successfully resist moderate hammer blows. Any connection which fails such test or which, upon inspection, indicates a porous or deformed weld, shall be remade.
- C. All exothermic welds shall encompass 100 percent of the ends of the materials being welded. Welds, which do not meet this requirement, shall be remade.
- D. Worn, damaged, incorrectly sized, or improperly shaped molds which, in the opinion of the Engineer, do not make satisfactory welds, shall be removed from the jobsite after being physically rendered inoperable.
- E. All contact surfaces of bolted and screwed connections shall be thoroughly cleaned and coated with oxide inhibitor before being securely tightened.

3.06 CONDUIT GROUNDING

- A. All grounding bushings within all enclosures, including equipment enclosures, shall be wired together and connected internally to the enclosure grounding lug or grounding bus with a bare copper conductor. Grounding bushings shall be grounded with conductors sized in accordance with NEC, but not smaller than #8 AWG.

3.07 EQUIPMENT GROUNDING

- A. Comply with NEC 250, except where larger sizes or more conductors are indicated.
 - 1. All electrical equipment shall be connected to the grounding system with an insulated, green, stranded or solid copper equipment-grounding conductor.
 - 2. Terminate each end on suitable lug, bus, or bushing. The term "electrical equipment", as used in this article, shall include, but not be limited to, all enclosures containing electrical connections or bare conductors, except that individual devices, such as solenoids, pressure switches, and limit switches, shall be exempt from this requirement, unless the device requires grounding for proper operation.
 - 3. Large equipment, such as metal-clad or metal-enclosed switchgear, will be furnished with a grounding bus that shall be connected to the grounding system.
 - 4. Most other equipment will be furnished with grounding pads and/or grounding lugs which shall be connected to the grounding system. All ground connection surfaces shall be cleaned immediately prior to connection.
 - 5. Contractor shall furnish all grounding material required, but not furnished with the equipment.
- B. Install equipment grounding system such that all metallic structures, enclosures, raceways, junction boxes, outlet boxes, cabinets, machine frames, portable equipment and other conductive items in close proximity with electrical circuits will operate continuously at ground potential and provide a low impedance path for possible ground fault currents.
- C. Where grounding system extension stingers are indicated on the drawings to be provided for connection to electrical equipment, the Contractor shall connect the bare grounding conductor to the equipment ground bus, pad, or lug. Except where otherwise indicated on the drawings, all equipment ground conductors that are not an integral part of a cable assembly, shall be sized in accordance with the requirements of NEC. All ground conductors installed in conduit shall be insulated.
- D. Suitable grounding facilities, acceptable to the Engineer, shall be furnished on electrical equipment not so equipped. The grounding facilities shall consist of compression type terminal connectors bolted to the equipment frame or enclosure and providing a minimum of joint resistance.

- E. The conduit system is not considered to be a grounding conductor, except for lighting fixtures. No grounding conductor shall be smaller in size than # 12 AWG, unless it is a part of an acceptable cable assembly.

3.08 GROUND SYSTEM RESISTANCE

- A. All ground resistance measurements shall be made with a three-terminal "Megger" type ground tester which applies alternating current to the electrodes and which gives a reading in direct current ohms. Two reference ground probes shall be used, and all tests shall be made in accordance with the instrument manufacturer's instructions for ground resistance testing. Some of the acceptable instruments are as follows:
 - 1. Megger Null Balance Earth Tester, James G. Biddle and Company.
 - 2. Vibroground, Associated Research, Inc.
 - 3. Ground-Ohmer, Herman H. Sticht Co., Inc.
- B. Submit final certified test reports of all grounding tests.

3.09 ANCHORS, FASTENERS AND SUPPORT

- A. Installation:
 - 1. Locate and install anchors, fasteners, and supports in accordance with NECA "Standard of Installation".
 - 2. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
 - 3. Do not use spring steel clips and clamps.
 - 4. Do not use powder-actuated anchors.
 - 5. Do not drill or cut structural members.
- B. Supports:
 - 1. Fabricate supports from structural steel or formed steel members. Rigidly weld members or install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
 - 2. Install surface-mounted cabinets and panel board with minimum of four anchors.
 - 3. In wet and damp locations use steel channel supports to stand cabinets and panel boards 1 inch off wall.

4. Use sheet metal channel to bridge studs above and below cabinets and panel boards recessed in hollow partitions.

3.10 IDENTIFICATION OF COMPONENTS

A. Installation:

1. Degrease and clean surfaces to receive nameplates and labels.
2. Install nameplate and label parallel to equipment lines.
3. Secure nameplate to equipment front using screws, rivets or adhesive.
4. Secure nameplate to inside surface of door on panel board that is recessed in finished locations.
5. Identify underground conduits using one underground warning tape for each trench at 15 inches (40 mm) below finished grade.
6. Conduit Marker Spacing: 20-feet on center.

3.11 SEALING AND FIREPROOFING

A. Fire-Rated Surface:

1. Seal opening at floor and wall as follows:
 - a. Opening through a fire rated wall, floor, ceiling or roof, must be sealed.
 - b. Install galvanized sheet metal sleeves (minimum 12-gage) through opening and extending beyond minimum of 1 inch on each side of building element.
 - c. Size sleeve allowing minimum of 1-inch void between sleeve and building element.
 - d. Pack void with backing material.
 - e. Seal ends of sleeve with UL listed fire-resistive silicone compound to meet fire rating of structure penetrated.
2. Where conduit penetrates fire-rated surface, install fire-stopping product in accordance with manufacturer's published instructions.

B. Non-Rated Surfaces:

1. Opening through a non-fire rated wall, floor, ceiling or roof must be sealed using an approved type of material.
2. Use galvanized sheet metal sleeves in hollow wall penetrations to provide a backing for the sealant. Grout area around sleeve in masonry construction.
3. Install escutcheons or floor/ceiling plates where raceway, penetrates non-fire rated surfaces in occupied spaces.
4. Install rubber links of mechanical seal tighten in place and sized for the pipe, in exterior wall openings below grade, in accordance with the manufacturer's instructions.
5. All pipe penetrations at interior partitions and/or walls, laboratory spaces, telephone, data and communication rooms and similar spaces where the room pressure or odor transmission must be controlled, shall be sealed. Sealant shall be applied to both sides of the penetration in such a manner that the annular space between the pipe sleeve and the pipe is completely filled.

3.12 ACCEPTANCE TESTING

A Grounding and Bonding: Perform inspections and tests as outlined below (NETA ATS, Section 7.13 – Grounding Systems).

1. Visual and Mechanical Inspection
 - a. Inspect ground system for compliance with drawings and specifications.
 - b. Electrical Tests (Small Systems)
 - 1) Perform ground-impedance measurements utilizing the fall-of-potential method per ANSI/IEEE Standard 81 "IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potential of a Ground System." Instrumentation utilized shall be as defined in section 12 of the above guide and shall be specifically designed for ground impedance testing. Provide sufficient spacing so that the plotted curves flatten in the 62% area of the distance between the item under test and the current electrode.
 - c. Electrical Tests (Large Systems)
 - 1) When sufficient spacing of electrodes per Electrical Tests (Small Systems) is impractical, perform ground impedance measurements utilizing either the

intersecting curves method or the slope method. (Ref. Nos. 40 and 41 in IEEE Std. 81).

d. Equipment Grounds

- 1) Utilize two-point method of IEEE Std. 81. Measure between equipment ground being tested and known low-impedance grounding electrode or system.

2. Test Values

- a. The main ground electrode system impedance-to-ground shall be no greater than five (5) ohms for commercial or industrial systems and one (1) ohm or less for generating stations, transmission stations, and large industrial systems. Equipment grounds, depending on size and length of grounding conductor, should be only fractionally higher than system ground.

END OF SECTION

SECTION 16123

600-VOLT WIRE AND CABLE

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes covers all labor, material, tools, equipment and services required to install wire and cable, wiring connectors and connections.

1.02 REFERENCES - CODES AND STANDARDS

- A. UL 83 Thermoplastic-Insulated Wires and Cables.
- B. ASTM B 8 Specifications for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.
- C. NECA (National Electrical Contractors Association) - Standard of Installation.
- D. NFPA 70 National Electrical Code (NEC). Latest approved edition.

1.03 DESCRIPTION OF WORK

- A. The requirements of this section apply to cable and wires specified on the drawings and in these specifications. The extent of electrical wire and cable work is indicated on drawings and schedules and by the requirements of this section. The applications for cable, wire and connectors required, but not limited to, are as follows:
 - 1. Power distribution circuitry.
 - 2. Lighting circuitry.
 - 3. Appliance and equipment circuitry.
 - 4. Wiring for motors of mechanical equipment.
 - 5. Wiring from the motors of mechanical equipment to the disconnect switches or junction boxes, including wiring for pushbuttons, pilot lights, interlocks and similar devices as directed, shown, or specified.
 - 6. Wiring from the motors of mechanical equipment to motor starters, including other auxiliary wiring as may be required, directed, or shown.

7. Control wiring for motors, mechanical equipment, relays and switches, and similar mechanical-electrical devices.

1.04 PROJECT CONDITIONS

- A. Conductor sizes are based on copper.
- B. Wire and cable routing shown on Drawings is diagrammatic unless dimensioned.
- C. Route wire and cable as required to complement project conditions.

1.05 REGULATORY REQUIREMENTS

- A. Furnish products listed and classified by Underwriters Laboratories, Inc. (UL), Electrical Testing Laboratories, Inc. (ETL), or other recognized, acceptable testing and listing agencies as suitable for the purpose specified and shown.

1.06 SUBMITTALS

- A. In accordance with Division 1 requirements.
- B. Product Data: Submit manufacturer's catalog cuts and technical data for building wire and cables.
- C. Test Report: Measure overall insulation resistance to ground. Provide certified test report for Engineer's Review.

1.07 CLOSEOUT SUBMITTALS

- A. In accordance with Division 1 requirements.
- B. Provide project record documents showing actual locations of components and circuits.

1.08 QUALIFICATIONS

- A. Manufacturer shall be a Company specializing in manufacturing products specified in this section with a minimum of five years' experience.

1.09 FIELD MEASUREMENTS

- A. Verify field measurements as indicated on drawings.

1.10 COORDINATION

- A. In accordance with Division 1 requirements.

- B. Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths required.
- C. Wire and cable routing indicated is approximate unless dimensioned. Include wire and cable lengths within 10 feet of length shown.

PART 2 - PRODUCTS

2.01 WIRE AND CABLE

- A. Wire and cable shall be insulated, single conductor, copper, stranded, rated for 600-volts AC. The insulation shall be thermoplastic or thermoset material rated for 90 degrees Celsius dry locations, 75 degrees Celsius wet locations, THW-2, THHN/THWN, RHW-2 or XHHW, per ANSI/NFPA 70.

2.02 INSTRUMENTATION AND CONTROL CABLES

- A. Instrumentation cables shall be minimum two (2) conductor No. 16 AWG, tin-coated copper, stranded, shielded twisted pair, 80 degree Celsius, PVC insulation foil shield with overall heavy duty polyethylene jacketing, rated for 600-volt AC, Belden 9342, West Penn TC2991, or equal.
- B. Control cables shall be a single conductor, insulated, No. 12 AWG minimum, copper, stranded, rated for 600-volts AC. The insulation shall be thermoplastic or thermoset material rated for 90 degrees Celsius dry locations, 75 degrees Celsius wet locations, THHN/THWN or XHHW, per ANSI/NFPA 70.
- C. Multi-conductor control cables shall consist of several single conductor, insulated No. 12 AWG minimum, copper, solid or stranded, rated for 600-volts AC with an overall protective PVC jacket. The insulation shall be thermoplastic or thermoset material rated for 90 degrees Celsius dry locations, 75 degrees Celsius wet locations, PVC, THHN/THWN or XHHW, per ANSI/NFPA 70. Circuit identification shall consist of Method 1 - color coding in accordance with ICEA S-66-524, Appendix K Table K-2.

2.03 WIRING CONNECTORS

- A. Split Bolt Connectors:
 - 1. Blackburn
 - 2. Burndy Corp.
 - 3. General Electric Co.

4. Ideal Industries Co.
 5. O.Z./Gedney Co.
 6. Thomas & Betts Co.
 7. 3-M Co.
- B. Solderless Pressure Connectors:
1. Blackburn
 2. Burndy Corp.
 3. Ideal Industries Co.
 4. Thomas & Betts Co.
 5. 3-M Co.
- C. Spring Wire Connectors:
1. Ideal Industries Co.
 2. 3-M Co.
- D. Compression Connectors:
1. Burndy Corp.
 2. Thomas & Betts Co.
 3. 3-M Co.

2.04 WIRE COLOR CODE

- A. Color-code all conductors:
1. Wire sizes 10 AWG and smaller shall have integral color-coded insulation.
 2. Wire sizes 8 AWG and larger may have black insulation but shall be identified by color-coded electrical tape at all junction, splice, pull, or termination points.
 3. Color tape shall be applied to at least 3 inches of the conductor at the termination ends and in junction or pull boxes or where readily accessible.

4. Conductors for all systems shall not change color at splice points.
5. Where there are two or more neutrals in one conduit, each shall be individually identified with the proper circuit.
6. For 4 AWG and larger ground conductors, identify with green tape at both ends and all visible points, included in all junction boxes.
7. Each phase shall be uniquely color-coded.
8. Color-code wires as indicated below:

<u>120/240-Volts</u>	<u>120/208-Volts</u>	<u>277/480-Volts</u>
Phase:	Phase:	Phase:
a – black	a - black	a – brown
b – red	b - red	b - orange
n – white	c - blue	c - yellow
g – green	n - white	n - white, or natural gray
	g - green	g - green

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. Verify that mechanical work likely to damage wire and cable has been completed.
- C. Verify that raceway installation is complete and supported.

3.02 PREPARATION

- A. Completely and thoroughly clean and swab raceway before installing wire.

3.03 EXISTING WORK

- A. Remove exposed abandoned wire and cable. Patch surfaces where removed cables pass through building finishes.
- B. Disconnect abandoned circuits and remove circuit wire and cable. Remove abandoned boxes if wire and cable servicing them is abandoned and removed. Provide blank cover for abandoned boxes that are not removed.

- C. Ensure access to existing wiring connections which remain active and which require access. Modify installation or provide access panel as appropriate.
- D. Extend existing circuits using materials and methods and compatible with existing electrical installations, or as otherwise specified.
- E. Clean and repair existing wire and cable that remain or is to be reinstalled.

3.04 INSTALLATION

A. General:

1. Install wire and cable in accordance with manufacturer's instructions and NECA "Standard of Installation".
2. Route wire and cable as required to meet project conditions.
3. Identify and color code wire and cable. Identify each conductor with its circuit number or other designation indicated.
4. Protect exposed cable from damage.
5. Pull all conductors into raceway at same time.
6. Use suitable wire pulling lubricant for building wire 4 AWG and larger.
7. Support cables above accessible ceiling using standard support methods to support cables from structure. Do not rest cable on ceiling panels.
8. Neatly train and lace wiring inside boxes, equipment, and panelboards

B. Cable and Wire Size:

1. Conductor sizes are based on copper unless indicated as aluminum or "AL".
2. Use conductor not smaller than 12 AWG for power and lighting circuits.
3. Use conductor not smaller than 14 AWG for control circuits.
4. Use 10 AWG conductors for 20 ampere, 120-volt branch circuits longer than 75 feet.

5. Use 10 AWG conductors for 20 ampere, 277-volt branch circuits longer than 200 feet.
 6. Use stranded conductor for all feeders, branch and control circuits.
- C. Special Techniques - Wiring Connections:
1. Clean conductor surfaces before installing lugs and connectors. Where an anti-oxidation lubricant is used, apply liberally, coating all exposed conductor surfaces.
 2. Use suitable cable fittings and connectors.
 3. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
 4. Tape un-insulated conductors and connector with two layers of half-lapped rubber insulating compound tape and two layers of half-lapped, 7-mil electrical tape, Scotch 33+, or equal.
 5. Use split bolt connectors for copper conductor splices and taps, 8 AWG and larger.
 6. Use solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.
 7. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
 8. Stranded conductors for control circuits shall have fork or ring terminals crimped on for all device terminations. Bare stranded conductors shall not be placed directly under the screws.

3.05 FIELD QUALITY CONTROL

- A. Visual and Mechanical Inspection:
1. Inspect wire and cable for physical damage and proper connection.
 2. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.
 3. Verify continuity of each branch circuit conductor.
 4. Inspect compression-applied connectors for correct cable match and indentation.
- B. Electrical Testing and Verification:

1. All 600 volt conductors 8 AWG and larger, shall be verified by use of a 500-volt meg-ohm-meter.
2. Perform continuity test to insure correct cable connection.
3. Correct malfunctions and/or deficiencies immediately as detected at no additional cost to the Owner, including additional verification testing.
4. Compile test report results and submit to Engineer for approval
5. Subsequent to final wire and cable terminations, energize all circuitry and demonstrate functional adequacy in accordance with system requirements.

C. Test Values

- a. Compare bolted connection resistance to values of similar connections.
- b. Bolt-torque levels should be in accordance with NETA ATS Table 10.12 unless otherwise specified by the manufacturer.
- c. Minimum insulation-resistance values should not be less than 50 meg-ohms.
- d. Investigate deviations between adjacent phases.

END OF SECTION

SECTION 16130
RACEWAY AND BOXES

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes conduit, outlet boxes, and pullboxes.

1.2 REFERENCES - CODES AND STANDARDS

- A. ANSI C80.1 Rigid Steel Conduit, Zinc Coated.
- B. UL 6 Rigid Metal Conduit
- C. NECA (National Electrical Contractor's Association) – "Standard of Installation."
- D. NEMA FB 1 (National Electrical Manufacturers Association) – Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- E. NEMA OS 1 (National Electrical Manufacturers Association) – Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- F. NEMA OS 2 (National Electrical Manufacturers Association) – Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports.
- G. NEMA TC 2 (National Electrical Manufacturers Association) – Rigid PVC Conduit and Tubing.
- H. NEMA TC 3 (National Electrical Manufacturers Association) – PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.3 SUBMITTALS

- A. In accordance with Division 1 requirements for submittal procedures.
- B. Product Data: Submit for the following:
 - 1. Galvanized rigid steel conduit.
 - 2. Liquid tight flexible metal conduit.
 - 3. Nonmetallic conduit.
 - 4. Raceway fittings.
 - 5. Conduit bodies.
 - 6. Boxes.

1.4 CLOSEOUT SUBMITTALS

- A. In accordance with Division 1 requirements.
- B. Project Record Documents:
 - 1. Record actual routing of conduits.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- B. Protect PVC conduit from sunlight.

1.6 COORDINATION

- A. In accordance with Division 1 requirements.

PART 2 PRODUCTS

2.1 CONDUIT

- A. Galvanized Rigid Steel Conduit (GRSC or RGS), couplings and elbows shall be hot-dip galvanized, rigid mild steel in accordance with ANSI C80.1 and UL 6. The conduit interior and exterior surfaces shall have a continuous zinc coating with a transparent overcoat of enamel, lacquer, or zinc chromate. Conduit shall be formed with continuous welded seams with a uniform wall thickness, in minimum 10-foot lengths, with threaded ends.
- B. Liquid-Tight Flexible Metal Conduit: plastic-jacketed, galvanized steel, "Sealtite" Type LT. Conduit shall be UL listed.
- C. Non-Metallic Conduit: Schedule 40, 90 C, UL 651 listed, composed of polyvinyl chloride conforming to NEMA Standard TC-2.

2.2 CONDUIT FITTINGS

- A. Metal Conduit Fittings: UL 514B. Galvanized iron or galvanized steel fittings shall be used with steel conduit. Threaded fittings shall engage a minimum of 5 threads made up wrench-tight and be compatible with conduit.
- B. Liquid-Tight Flexible Conduit Fittings: galvanized steel, insulated throat, and shall bear the UL label.
- C. Non-Metallic Conduit Fittings: NEMA TC-3, same material and strength characteristics as conduit.

- D. Bushings: galvanized steel or malleable iron, insulated throat-type for conduit 1-1/4 inches and larger.
- E. Locknuts: One interior and one exterior locknut shall be provided for all conduit terminations not provided with threaded hubs and couplings. Locknuts shall be designed to securely bond with the conduit to the box when tightened. Locknuts shall be so constructed that they will not be loosened by vibration.

2.3 OUTLET BOXES

- A. Outlet boxes used in wet outdoor locations: surface mounted, cast metal (FS or FD type) with mounting lugs and gasketed covers.

2.4 PULLBOXES

- A. Description: Precast concrete pullbox comprising modular, interlocking sections, complete with accessories. Open bottom for use with gravel sump.
- B. Loading: ASTM C857, Class A-16.
- C. Nominal Inside Dimensions: 11 x 17 inches.
- D. Inside Depth: 12 inches.
- E. Covers: Non-slip steel plate with tamperproof fasteners. Furnish cover marked ELECTRIC.

PART 3 EXECUTION

3.1 EXAMINATION

- A. In accordance with Division 1 requirements.
- B. Verify outlet locations and routing and termination locations of raceway prior to rough in.

3.2 INSTALLATION OF RACEWAYS

- A. Routing
 1. Install raceway and boxes in accordance with NECA "Standard of Installation."
 2. Conduit routing shown on drawings is diagrammatic only. Field route conduit and raceways between equipment and devices as required to obtain a complete wiring system.

- B. Couplings
 - 1. Metal conduit shall be joined by threaded conduit couplings, with the conduit ends butted. The use of running threads will not be permitted.

- C. Bends and Offsets
 - 1. Changes in direction of conduits shall be made with fittings or bends.
 - 2. Conduit bends shall meet the requirements of NEC or the bend radius of cable installed, whichever is more limiting.
 - 3. Bends shall be made using appropriate tools or mechanical equipment. The use of a pipe tee or vise for bending conduit or tubing will not be permitted.
 - 4. For non-metallic conduit, approved factory bends and offsets shall be used.
 - 5. Conduits or tubing deformed or crushed in any way shall be removed from the job site. Install no more than the equivalent of three 90 degree bends between boxes or outlets

- D. Cutting and Threading
 - 1. The plane of all conduit ends shall be square with the centerline.
 - 2. Where threads are required, they shall be cut and cleaned prior to conduit reaming.
 - 3. The ends of all conduit and tubing shall be reamed to remove all rough edges and burrs.
 - 4. Cutting oil shall be used in threading operations; the dies shall be kept sharp, and provisions shall be made for chip clearance.
 - 5. Threads on conduits and fittings shall be lubricated with conducting and sealing compound.

- E. All steel conduit shall be re-galvanized after threading with "Galvanizing Powder M-321" as manufactured by the American Solder and Flux Company of Philadelphia, Pennsylvania; "Zincilate 810" as manufactured by Industrial Metal Protectives, Inc., of Dayton, Ohio; "Zinc Rich" coating as manufactured by ZRC Chemical Products Company, Quincy, Massachusetts; or approved equal.

- F. Connections to Boxes and Cabinets
 - 1. Conduit shall be securely fastened to all boxes and cabinets.
 - 2. Threads on metallic conduit shall project through the wall of the box to allow the bushing to butt against the end of the conduit.
 - 3. The locknuts, both inside and outside, shall then be tightened sufficiently to bond the conduit securely to the box.

- G. Cleaning
 - 1. Precautions shall be taken to prevent the accumulation of water, dirt, or concrete in the conduit.
 - 2. Conduit in which water or other foreign materials have been permitted to accumulate shall be thoroughly cleaned or, where such accumulation cannot be removed by methods acceptable to the Owner /Engineer, the conduit shall be replaced.

- H. Galvanized Rigid Steel Conduit
 - 1. Galvanized rigid steel conduit shall be installed in areas before transition from below grade to all areas above grade, unless exposed to corrosive materials or otherwise noted on the drawings.
 - 2. Conduit in contact with earth shall be protected by "Scotchwrap" 10 mil tape applied in double thickness using 50% lap turns to 6 inches above grade and 6 inches beyond transition couplings. PVC-coated galvanized rigid conduit may be used instead of providing tape wrap.

- I. Liquid-Tight Flexible Metal Conduit
 - 1. Liquid-tight flexible metal conduit shall be installed with at least one bend so that the conduit can relieve thermal expansion or vibration.

- J. Non-Metallic Conduit
 - 1. PVC conduit shall be used for all power, signal feeders and branch circuits, in earth, enclosed in concrete, or when exposed to corrosive materials, unless otherwise noted on the drawings.

- K. Ground and bond raceway and boxes in accordance with Section 16050.

3.3 CABINET AND BOX INSTALLATION

- A. Install electrical boxes as shown on drawings, and as required for splices, taps, wire pulling, and equipment connections.
- B. Support boxes independently of conduits.
- C. Use cast outlet box in exterior locations where exposed to the weather and wet locations (interior or exterior).
- D. Coordinate installation of electrical boxes and fittings with cable and raceway installation work. Provide knockout closures to cap unused knockout holes where blanks have been removed.
- E. Locate boxes and conduit bodies so as to ensure ready accessibility of electrical wiring.

- F. Conduit openings in boxes shall be made with a hole saw or shall be punched.

3.4 CLEANING

- A. In accordance with Division 1 requirements.
- B. Clean interior of boxes to remove dust, debris, and other material.
- C. Clean exposed surfaces and restore finish.

END OF SECTION

SECTION 16195

ELECTRICAL EQUIPMENT IDENTIFICATION

PART 1 GENERAL

1.1 SUMMARY

- A. The extent of the electrical systems and equipment requiring identification is shown on the drawings, and the extent of identification required is specified herein and in individual sections of work requiring identification. The types of electrical identification specified in this section include the following:
1. Exposed conduit color banding.
 2. Buried cable warnings.
 3. Cable/conductor identification.
 4. Operational instructions and warnings.
 5. Equipment/system identification signs.

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. NFPA 70 National Electrical Code (NEC). Latest approved edition.
- B. APWA ULCC Uniform Color Code for Buried Utilities.
- C. ANSI Z535.1 Safety Color Code.

1.3 SYSTEM DESCRIPTION:

- A. Identify all electrical equipment as stated below:
1. All transformers shall be identified by 1-inch high block letters cut in stencil and applied with yellow paint on a flat-black background. The transformer number, primary and secondary voltages, and the kVA shall be shown.
 2. All panelboards, distribution or electrical equipment enclosure shall be identified by nameplates. The circuit number, voltage, and phase shall be shown.
 3. Identify by the circuit number shown on the drawings all receptacles and lighting switches by using ¼-inch high white characters on ½-inch wide black stick-on tape placed on the wall directly above the device if the device is wall mounted. Place the tape on the device enclosure if the device is not wall mounted.
 4. All motors, starters, disconnect switches, and control devices shall be identified by circuit number, with ¼-inch high white characters on a ½-inch wide black stick-on tape.

5. All branch circuits in outlet boxes shall be identified with circuit number using wrap-around labels.
6. All underground raceway or cable shall be marked with buried warning tape along its entire length.
7. All exposed raceway longer than 10 feet in length shall be identified.
8. Furnish all panelboards with a complete 5-inch by 7-inch typewritten directory mounted in the inner door under a clear plastic cover set in a metal frame.

1.4 CONTRACTOR SUBMITTALS

- A. In accordance with Division 1 requirements.
- B. Catalog data for nameplates, labels, and markers.
- C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under regulatory requirements. Include instructions for storage, handling, protection, examination, preparation and installation of Product.

1.5 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70 – National Electrical Code.
- B. Furnish products listed and classified by Underwriters' Laboratories, Inc. (UL), Electrical Testing Laboratories, Inc. (ETL), or other recognized, approved testing and listing agencies as suitable for the purpose specified and shown.

PART 2 PRODUCTS

2.1 NAMEPLATES AND LABELS

- A. Nameplates
 1. Engraved three-layer laminated plastic, white letters on black background for normal power and white letters on red background for emergency power. Communications and control cabinets shall be labeled with white letters on green background.
 2. Locations
 - a. Each electrical distribution and control equipment enclosure.
 - b. Communication cabinets.
 - c. Motor control centers, including each combination module.
 3. Letter Size
 - a. Use 1/8-inch letters for identifying individual equipment and loads.

- b. Use ¼-inch letters for identifying grouped equipment, loads, panelboards, and transfer switch.
 - c. Use ½-inch letters for identifying the main switchboard, motor control centers, and large distribution switchboards.
- B. Labels
 - 1. Adhesive tape, with 3/16-inch white letters on colored background to match color scheme of plastic laminate labels in 2.1.1. Use only for identification of individual wall switches and receptacles, control device stations, and multi-outlet devices.

2.2 WIRE MARKERS

- A. Vinyl or cloth tape, split sleeve or tubing-type preprinted wire markers, self-adhesive.
- B. Manufacturers:
 - 1. Brady
 - 2. Thomas & Betts
 - 3. 3-M Co.
- C. Locations: Each conductor at panelboard gutters, pull boxes, outlet and junction boxes, control panels, motor controllers and starters, and each load connection.
- D. Legend
 - 1. Power and Lighting Circuits: Branch circuit or feeder number indicated on contract drawings.
 - 2. Control Circuits: Control wire number indicated on shop drawings.
 - 3. Neutral Conductors: Clearly indicate the branch circuit or feeder number the neutral serves. In multi-wire circuits where the neutral is shared, mark the neutral with the circuit number of the "A" phase.

2.3 CONDUIT MARKERS

- A. Provide manufacturer's standard preprinted, flexible or semi-rigid, permanent, plastic-sheet conduit markers, minimum of 3 mils thick and 1-1/2-inch wide extending 360 degrees around conduits; designed for self-adhesive attachment to conduit. Except as otherwise indicated, provide lettering that indicates the voltage of the conductor(s) in the conduit. Provide 8-inch minimum length for 2-inch and smaller conduit, 12-inch minimum length for larger conduit.
- B. Location: Furnish markers for each conduit longer than 10 feet.
- C. Spacing: 20 feet on center.

- D. Color: Unless otherwise indicated or required by governing regulation, provide orange markers with black letters.
 - 1. Fire Alarm System: Red w/black letters.
 - 2. Telephone System: Green w/yellow letters.
 - 3. Data/Communication. System: White w/black letters.
 - 4. Emergency System: Yellow w/black letters.

- E. Legend:
 - 1. 480 Volt System: Normal 480/277-volts.
 - 2. 208 Volt System: Normal 208/120-volts.
 - 3. Fire Alarm System: Fire alarm.
 - 4. Telephone System: Telephone.
 - 5. Data/Communication System: Data/communications.

2.4 FASTENERS

- A. Secure all labels and nameplates with self-tapping stainless steel screws. Use contact type permanent adhesive where screws cannot or should not penetrate the substrate.

2.5 LETTERING AND GRAPHICS

- A. Coordinate names, abbreviations and other designations used in the electrical identification work, with the corresponding designations shown, specified or scheduled. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturers or as required for proper identification and operation/maintenance of the electrical systems and equipment.

2.6 UNDERGROUND WARNING TAPE

- A. Three-inch minimum width 5 mil thickness, foil bonded polyethylene tape, detectable type, with suitable continuous warning legend describing buried electrical lines. Tape color shall conform to APWA uniform color code using ANSI Z535.1 safety colors. Text shall be black, 2-inch minimum letters.

PART 3 EXECUTION

3.1 PREPARATION

- A. Degrease and clean surfaces to receive nameplates and labels.

- B. Coordination: Where identification is to be applied to surfaces that require finish, install identification after completion of painting.

- C. Regulations: Comply with governing regulations and the requests of governing authorities for the identification of electrical work.

3.2 APPLICATION

- A. Install nameplate and label parallel to equipment lines.
- B. Secure nameplate to equipment front using screws, rivets, or adhesive.
- C. Secure nameplate to outside moveable surface of door on panelboard.
- D. Conduit Identification:
 - 1. Where electrical conduit is exposed in spaces with exposed mechanical piping, which is identified by a color-coded method, apply color-coded identification on the electrical conduit in a manner similar to the piping identification. Except as otherwise indicated, use orange as the coded color for conduit.
 - 2. Paint red band on each fire alarm conduit longer than 10 feet.
 - 3. Paint bands 20 feet on center.
- E. Cable/Conductor Identification:
 - 1. Apply cable/conductor identification on each cable and conductor in each box/enclosure/cabinet where the wires of more than one circuit or communication/signal system are present, except where another form of identification (such as color-coded conductors) is provided.
 - 2. Match identification with marking system used in panelboards, shop drawings, contract documents, and similar previously established identification for project electrical work.
- F. Operational Identification and Warnings
 - 1. Wherever reasonably required to ensure safe and efficient operation and maintenance of the electrical systems, and electrically connected mechanical systems and general systems and equipment, including the prevention of misuse of electrical facilities by unauthorized personnel, install self-adhesive plastic signs or similar equivalent identification, instruction or warnings on switches, outlets and other controls, devices and covers of electrical enclosures. Where detailed instructions or explanations are needed, provide plasticized tags with clearly written messages adequate for the intended purposes.
- G. Equipment/System Identification Signs
 - 1. Install an engraved plastic-laminate sign on each major unit of electrical equipment in the building; including the central or master unit of each electrical system and the communication/signal

- systems, unless the unit is specified with its own self-explanatory identification or signal system.
2. Except as otherwise indicated or specified, provide single line of text, ½-inch high lettering on 1-1/2-inch high sign (2-inch high where two lines are required), white lettering in black field.
 3. Provide text matching terminology and numbering of the contract documents and shop drawings.
 4. Provide signs for each unit of the following categories of electrical work
 - a. Major electrical switchboard
 - b. Electrical substation
 - c. Motor control center
 - d. Fire alarm control panel and annunciators.
- H. Install signs at locations indicated or, where not otherwise indicated, at location for best convenience of viewing without interference with operation and maintenance of equipment. Secure to substrata with fasteners, except use adhesive where fasteners should not or cannot penetrate the substrata.
- I. Identify underground conduits using underground warning tape. Install one tape per trench at 6 inches below finished grade.

END OF SECTION

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SECTION 16413

AUTOMATIC TRANSFER SWITCH

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes automatic transfer switches furnished open for installation in a motor control center.

1.2 RELATED SECTIONS

- A. Section 13400 – Electrical Control and Instrumentation
- B. Section 16195 – Electrical Equipment Identification
- C. Section 16480 – Motor Control Centers

1.3 REFERENCES - CODES AND STANDARDS

- A. NEMA ICS 10 (National Electrical Manufacturers Association) – AC Transfer Switch Equipment.
- B. NETA ATS (International Electrical Testing Association) – Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems
- C. UL 1008 Automatic Transfer Switches.

1.4 SUBMITTALS

- A. In accordance with Division 1 requirements.
- B. Product Data: Submit catalog sheets showing voltage, switch size, ratings and size of switching and overcurrent protective devices, operating logic, short-circuit ratings, dimensions, and enclosure details.
- C. Test Reports: Indicate results of manufacturer's certification of performance testing.
- D. Manufacturer's Field Report: Indicate inspections, findings, and recommendations.

1.5 CLOSEOUT SUBMITTALS

- A. In accordance with Division 1 requirements.

- B. Operation and Maintenance Data: Submit instructions and service manuals for normal operation and routine maintenance. List special tools, maintenance materials, and replacement parts.

1.6 QUALIFICATIONS

- A. Manufacturer: Company shall specialize in manufacturing the products specified in this section with minimum three years' experience and with service facilities within 100 miles of project.
- B. Supplier: Authorized distributor of specified manufacturer with minimum three years' experience.

1.7 MAINTENANCE SERVICE

- A. In accordance with Division 1 requirements.
- B. Furnish service and maintenance of transfer switches for one year from Date of Substantial Completion.

1.8 WARRANTY

- A. Furnish two-year manufacturer's warranty from start-up and acceptance date for defective parts and labor to install the part.

PART 2 PRODUCTS

2.1 AUTOMATIC TRANSFER SWITCH

- A. Product Description: NEMA ICS 10, automatic transfer switch.
- B. Configuration: Electrically operated, mechanically held transfer switch.
- C. Rating: 480 volts, 3 pole, current rating as indicated.
- D. Interrupting Capacity: 100 percent of continuous rating.
- E. Withstand Current Rating: 30,000 RMS symmetrical amperes when used with molded case circuit breaker.
- F. Service Conditions: NEMA ICS 10
 1. Temperature: -40 to +50 degrees C
 2. Relative Humidity: up to 95 percent
 3. Altitude: 50 feet (15 meters) above sea level
- G. Product Features:
 1. Main transfer switch contacts shall be visible for inspection without disassembly and/or removal of any parts or barriers.

2. Indicating Lights: Mount on front panel to indicate normal source available, alternate source available, switch position.
 3. Test Switch: Mount on front panel of switchboard to simulate failure of normal source.
 4. Return to Normal Switch: Mount on front panel to initiate manual transfer from alternate source to normal source.
 5. Transfer Switch Auxiliary Contacts: two normally open; two normally closed.
 6. Normal Source Monitor: Monitor normal source voltage and frequency; initiate transfer when voltage drops below 85 percent or frequency varies more than 3 percent from rated nominal value.
 7. Alternate Source Monitor: Monitor alternate source voltage and frequency; inhibit transfer when voltage is below 85 percent or frequency varies more than 3 percent from rated nominal value.
 8. In-Phase Monitor: Inhibit transfer until source and load are within 10 electrical degrees.
- H. Automatic Sequence of Operation:
1. Initiate Time Delay to Start Alternate Source Engine Generator: Upon initiation by normal source monitor.
 2. Time Delay to Start Alternate Source Engine Generator: 0 to 5 seconds, adjustable.
 3. Initiate Transfer Load to Alternate Source: Upon initiation by normal source monitor and permission by alternate source monitor.
 4. Time Delay before Transfer to Alternate Power Source: 0 to 120 seconds, adjustable.
 5. Initiate Retransfer Load to Normal Source: Upon permission by normal source monitor.
 6. Time Delay before Transfer to Normal Power: 0 to 120 seconds, adjustable; bypass time delay in event of alternate source failure.
 7. Time Delay before Engine Shutdown: 0 to 10 minutes, adjustable, of unloaded operation.
 8. Engine Exerciser: Start engine every 30 days; run for 30 minutes before shutting down. Bypass exerciser control when normal source fails during exercising period.
 9. Alternate System Exerciser: Transfer load to alternate source during engine exercising period.
- I. Enclosure:
1. The transfer switch shall be provided open and shall be mounted and interconnected within the MCC.

2.2 SOURCE QUALITY CONTROL

- A. Furnish shop inspection and testing of transfer switch.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install engraved plastic nameplates in accordance with Section 16050.

3.2 MANUFACTURER'S FIELD SERVICES

- A. In accordance with Division 1 requirements.
- B. Engage the services of a factory-authorized service representative to inspect field-assembled components and equipment installation, including phasing, electrical connections, and to assist in testing. Report results in writing.
- C. Check out transfer switch connections and operations, and place in service.
- D. Adjust control and sensing devices to achieve specified sequence of operation.
- E. Inspect and test in accordance with NETA ATS, except Section 4.
- F. Perform inspections and tests listed in NETA ATS, Section 7.22.3.

3.3 DEMONSTRATION AND TRAINING

- A. Furnish four hours of instruction for four persons, to be conducted at project site with manufacturer's field service representative. Instruction shall include handouts to all trainees describing the procedures for the proper operation, adjustment and maintenance of the automatic transfer switch. Use approved O&M manuals.
- B. Demonstrate operation of transfer switch in normal and emergency modes.
- C. Simulate power outage by interrupting the normal source, and demonstrate that system operates to provide emergency power. Coordinate testing and training to coincide with the engine-generator unit testing and training.

END OF SECTION

SECTION 16480
MOTOR CONTROL CENTERS

PART 1 GENERAL

1.1 SUMMARY

- A. This section covers the furnishing and installation of motor control center equipment, motor starters, controls, and accessories.

1.2 RELATED SECTIONS

- A. Section 13400 – Electrical Control and Instrumentation
- B. Section 16050 – Basic Electrical Materials and Methods
- C. Section 16195 – Electrical Equipment Identification
- D. Section 16413 – Automatic Transfer Switch

1.3 REFERENCES - CODES AND STANDARDS

- A. The standards referenced herein, except as modified in the Contract Documents, shall have full force and effect as though included in these Specifications. These standards are not furnished to the Contactor since manufacturers and trades involved are assumed to be familiar with these requirements. The Contractor shall obtain copies of reference standards direct from publication sources as needed for proper performance and completion of the work.
 - 1. ANSI C37.17 Trip Devices for AC and General Purpose DC Low Volume Power Circuit Breakers.
 - 2. IEEE 142 Recommended Practice for Grounding of Industrial and Commercial Power Systems.
 - 3. NECA Standard of Installation
 - 4. NEMA AB 1 (National Electrical Manufacturers Association) Molded Case Circuit Breakers
 - 5. NEMA ICS 2 Industrial Control Devices, Controllers and Assemblies
 - 6. NEMA ICS 2.3 Instructions for the Handling, Installation, Operation, and Maintenance of Motor Control Centers
 - 7. NEMA ICS 3 Industrial Control and Systems: Factory Built Assemblies
 - 8. NEMA ICS 3.1 Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems

9. NEMA ICS 4 Industrial Control and Systems: Terminal Blocks
10. NEMA ICS 5 Industrial Control and Systems: Control Circuit and Pilot Devices
11. NEMA ICS 6 Industrial Control and Systems: Enclosures
12. NEMA ICS 7 Industrial Control and Systems: Adjustable Speed Drives.
13. NEMA FU 1 Fuses
14. NEMA KS 1 Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum)
15. NETA ATS Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems
16. NFPA 70 National Electrical Code
17. UL 94 Tests for Flammability of Plastic Materials for Part in Devices and Appliances.
18. UL 845 Electrical Motor Control Center

1.4 REGULATORY REQUIREMENTS

- A. Equipment shall conform to the requirements of ANSI/NFPA 70, NEMA ICS 2 and UL 845.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. (UL), Electrical Testing Laboratories, Inc. (ETL), or other recognized, acceptable testing and listing agencies as suitable for the purpose specified and shown.

1.5 SUBMITTALS

- A. Shop Drawings:
 1. Motor Control Center front panel elevation, side views and plan view showing overall dimensions; conduit entrance locations; circuit breaker and motor starter arrangement; and enclosure details including support point.
 2. Electrical characteristics including voltage rating; ampacity of horizontal and vertical main bus, neutral bus and ground bus; integrated short circuit ampere rating; starter size; circuit breaker frame size and trip ratings; and name plate legends.
 3. Single line diagrams, interconnection diagrams, connection diagrams, control logic diagrams, and point-to-point wiring diagrams.
 4. Complete elementary and schematic wiring diagrams with all wires numbered for all control systems.
 5. Calculations and enclosure anchoring method (anchor bolt size, embedment and assembly details) to meet California seismic Zone 4 requirements.

6. Complete description of the MCC enclosure primer and finish painting, including paint manufacturers and types, paint colors, painting processes, and dry film thicknesses.
- B. Product Data:
1. Catalog sheets showing equipment rating and size of all motor control center components.
 2. Circuit breaker time-current characteristic curves and overload relay thermal element (heater strip) time-current characteristic curves.
- C. Test Report:
1. Factory Tests.
 - a. The motor control centers shall be factory-tested in accordance with NEMA standards and ANSI C37.17, together with any additional tests which may be required to ensure that the wiring is correct and that all equipment is in a satisfactory operating condition.
 - b. Certified factory test reports shall be submitted for manufacturer performed routine factory tests, including tests required by standards listed in paragraph "References". Results of factory tests performed shall be certified by the manufacturer, or an approved testing laboratory, and submitted within 7 days following successful completion of the tests. The manufacturer's pass-fail criteria for tests specified in paragraph "Field Testing" shall be included.

1.6 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Product Data and shop drawings as described under Submittals.
- B. Operation and Maintenance Data: Submit instructions and service manuals for normal operation and routine maintenance. List special tools, maintenance materials, and replacement parts. Include complete information for tightening of all electrical connections secured with bolts or studs.
- C. Furnish as-built elementary and schematic drawings with all manufacturer's equipment, control panels, devices, etc., in detail on the elementary diagram with all terminal points of such equipment indicated.
- D. Manufacturer's Field Report: Indicate inspections, findings, and recommendations.
- E. Field Test Report: Indicate inspections, findings, and recommendations.

1.7 MAINTENANCE MATERIALS

- A. The MCC manufacturer shall provide at least one complete set of the following:
 - 1. Power fuses – 3 of each size
 - 2. Control fuses – 12 of each size
 - 3. Cluster LED type indicating lights – 6 of each color
 - 4. Control transformer
 - 5. Other field-replaceable component parts
- B. Maintenance material shall be suitably packaged with labels indicating the contents of each package. The material shall be delivered to the District.

1.8 WARRANTY

- A. Furnish two (2) year manufacturer's warranty from date of substantial completion for defective parts and labor to install the part.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver in 60-inch maximum width shipping splits, individually wrapped for protection, and mounted on shipping skids.
- B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic. Provide space heaters if required, to prevent condensation and keep the equipment dry.
- C. Handle in accordance with NEMA ICS 2.3. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to motor control center components, enclosure, and finish.

1.10 QUALIFICATIONS

- A. Manufacturer: Company specialized in manufacturing the products specified in this section with recent minimum five (5) years experience.
- B. Supplier: Authorized distributor of specified manufacturer with recent minimum five (5) years experience.

1.11 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication

PART 2 PRODUCTS

2.1 MOTOR CONTROL CENTER

- A. General
 - 1. The motor control center shall be designed and constructed for use on a 480 volt, three-phase, four-wire, 60 Hz, solidly grounded system.
 - 2. Except as specified otherwise herein all equipment shall be designed for service below 3,000 feet above sea level at an ambient temperature of 40°C maximum.
- B. Arrangement
 - 1. The motor control center shall be located as indicated on the drawings.
- C. Construction
 - 1. Motor control center equipment shall be mounted in compartmented vertical sections fabricated of steel and assembled to provide a rigid self-supporting structure. Thickness of the steel sheets shall be not less than the thickness specified in UL 845, Table 1.
 - a. Protect all iron and steel components of the motor control center against corrosion by methods specified in UL 845.
 - b. Fasteners for removable panels shall be stainless steel screw type, inserted in captive nuts, held in place by nut retainer clips.
 - c. Provide 100 percent replacement screw type fasteners if they are of a non-captive type and 50 percent replacement of screw type fasteners if they are of a captive type.
 - d. Provide lifting angles on top of each motor control center shipping section.
 - e. Provide a metal protective pouch, in each compartment, to hold wiring diagrams and equipment information.
 - 2. Enclosures
 - a. Outdoor Locations: Motor Control Center located outdoors shall be housed in an outer weatherproof, NEMA 3R, 316 stainless steel enclosure constructed as follows:
 - 1) Steel support frame with body stiffeners for added strength and minimum 12 gauge 316 stainless steel panels all around.
 - 2) Steel panels shall have seams that are continuously welded and ground smooth with no holes or knockouts.

- 3) The outer door shall provide two-door protection, isolation of electrical equipment and easy access to the interior section doors and devices.
 - 4) Provide rolled lip around three sides of each outer door and along the top of enclosure opening to channel away liquids and contaminants.
 - 5) Provide oil-resistant door gasket attached with oil resistant adhesive and held in place with steel retaining strips.
 - 6) Provide heavy gauge steel continuous piano hinged, 3-point latch, hasp and staple for pad-locking.
 - 7) Provide continuous external support channels for floor mounting, leveling and anchoring the assembly.
 - 8) Provide heavy duty removable lifting angles and/or lugs.
 - 9) Provide suitable grounding stud on door and body.
 - 10) Provide adequate cable entry space and conduit fittings approved for NEMA Type 3R enclosure for top or bottom conduit entry as indicated on the drawings.
 - 11) Provide space heaters with thermostat control in each section to prevent condensation.
3. Wire Troughs. Horizontal wire troughs shall be located at the top and bottom of each section, aligned and located to provide a continuous wire way of the same cross-sectional dimensions throughout the length of the assembled motor control center. A vertical wire trough equipped with wire ties shall extend the full height of each section.
 4. Compartments. Each motor control section shall accommodate not more than six NEMA Size 1 or Size 2 combination magnetic starters. All individual units shall be isolated from each other by metal barriers when the units are assembled in the operating position and when the units are removed or replaced in the section structure. All section compartments shall be front accessible only.
 5. Doors. Provide gasketed and full length piano hinged doors on the front of each starter unit and each feeder tap unit. Doors shall be designed to allow easy maintenance or replacement of all removable starters, disconnecting and branch circuit overcurrent protective devices and similar devices from the front. A separate hinged and gasketed full-height door shall be furnished on the front of each section to allow access to the vertical wire trough without opening any starter unit or feeder tap unit door.
 6. Equipped Spare. A space designated as "Spare" shall be furnished complete with stab-ins, guide rails, guide rail supports, starter unit or feeder tap unit, doors and all control devices and other hardware to permit connection of a load.

7. Space. Blank unassigned spaces shall be complete with vertical bus and removable covers over all openings between the unit compartment and the bus, but shall not include stab-ins, guide rails, guide rail supports, etc.
 8. Future Additions and Modifications. The ends of each end vertical section shall be arranged to allow the future installation of similar sections. Each section shall be arranged to allow the removal, addition, interchange, or replacement of individual units as may be required.
- D. Circuit Breakers. Each compartment not designated as "Space" shall include a circuit breaker with RMS symmetrical interrupting rating to match MCC main bus.
1. Circuit Breaker shall be three-pole, single-throw, 600-volt, molded-case air circuit breaker with not less than 25,000 amperes RMS symmetrical interrupting rating at 480-volts. All breakers, including magnetic trip only type breakers, shall bear the UL label and shall be manually operated with quick-make, quick-break, trip-free mechanisms of the toggle type. The breakers shall be equipped with suitable arc quenching devices. Main current carrying contacts shall be silver-plated and shall be capable of carrying their rated current without exceeding the UL specified temperature rise.
 2. All circuit breakers shall be of the same manufacture throughout the composite motor control center assembly.
 3. Manual operating handles shall be furnished on the access doors of the compartment to operate the circuit breaker. Provisions shall be made for padlocking each handle in the open position. Each operating handle shall indicate when the breaker has tripped automatically.
 4. Access doors shall be interlocked with the operating handles to prevent opening the doors normally when the circuit breakers are in the CLOSED position. Provisions shall be made for overriding this interlock.
- E. Bussing
1. Main and Neutral Bus. The motor control center main horizontal and vertical busses shall be insulated copper designed to continuously carry the full load rated current as specified, without exceeding temperature rise requirements.
 - a. Main Horizontal Busses: Ampere rating equal to the Main circuit breaker frame size rating
 - b. Vertical Busses: Ampere rating equal to the sum of connected load on that buss but not less than 300-amperes.
 - 1) The bus shall be installed with rigid, non-tracking, fire-resistant, and non-hygroscopic molded insulating supports with high dielectric strength and high

- creepage surface capable of withstanding the mechanical forces imposed by short-circuit currents of the magnitude specified on the drawings.
- 2) Bus shall be silver-plated for the entire length of the bus.
 - 3) All joints shall have silver-plated contact surfaces with minimum contact resistance.
2. Ground Bus. An un-insulated copper bar ground bus with a continuous current rating of 50 percent of the horizontal main bus shall be furnished through the entire length of the motor control center. All motor control center equipment requiring grounding shall be connected to this ground bus.
- F. Cable Entry and Termination
1. External Connections. Facilities for the entrance, support, termination, and connection of power, control, and ground conductors shall be furnished in accordance with NEMA requirements for Class I, Type B motor control centers, and in accordance with the following requirements.
 - a. An incoming line termination compartment shall be provided for entry cables. The manufacturer shall extend the main bus into a compartment of the vertical section for termination of the incoming line. Each incoming line termination compartment shall be not less than 18 inches high, and shall be located at the top or bottom of the vertical section to coordinate with the direction of incoming line cable entrance specified.
 - b. Adequate openings shall be furnished for all power cable and control cable entering the motor control center from both top and bottom as indicated on the drawings.
- G. Integrated Short Circuit Rating. The integrated short circuit rating of the motor control center shall be as indicated on the drawings, but no less than 22,000 amperes RMS symmetrical at 480-volts, 60 Hertz nominal, and minimum 80 percent power factor.
- H. Terminals. Provide terminals for all power, control, and ground conductors entering the motor control centers. Terminal connectors shall be furnished for all incoming line cables and shall be as listed in the following table or acceptable equal. Solder-type terminals are not acceptable.
1. Terminal connectors shall be furnished for all load and control conductors of combination motor starter and feeder tap units as part of the manufactured assembly.
 2. Each combination motor starter unit shall be furnished with terminal blocks located adjacent to the vertical wire way for termination of control cable. Terminal blocks shall be manufacturer's standard

side-mounted, pressure pull-apart type control terminal blocks rated 480-volt AC. Control cable terminal blocks for combination motor starter units shall be furnished with not less than 18 terminals, with provisions for future terminal blocks.

3. Connectors for attachment of ground busses to the external equipment grounding conductor system shall be suitable for copper conductors, sized to connect to the installed equipment grounding conductor. One connector shall be provided at each end of each motor control center ground bus. A load ground connector shall be furnished by the Contractor, on the ground bus, for each combination starter unit and each feeder tap unit.
 - I. Phase Monitor. Provide a fused phase monitor on the load side of the Automatic Transfer Switch for interlocking of the pumps. The phase monitor shall be a Diversified Systems SLA-440 ALE as shown on the drawings.
 - J. Nameplates. An engraved nameplate shall be furnished for the motor control center, each starter unit door, and each feeder tap unit door. In accordance with the requirements of Section 16195 – Electrical Equipment Identification. Nameplate inscriptions will be as indicated on the drawings or as provided by the Owner during shop drawing review.

2.2 SOLID-STATE REDUCED-VOLTAGE MOTOR CONTROL

- A. The solid-state reduced-voltage starter shall be UL and CSA listed. The solid-state reduced-voltage starter shall be an integrated unit with power SCRs, logic board, paralleling bypass contactor, and electronic overload relay enclosed in a single molded housing. The controller shall be sized for the driven equipment.
- B. The SCR-based power section shall consist of six (6) back-to-back SCRs and shall be rated for a minimum peak inverse voltage rating of 1500 volts PIV.
- C. Units using triacs or SCR/diode combinations shall not be acceptable.
- D. Resistor/capacitor snubber networks shall be used to prevent false firing of SCRs due to dV/dT effects.
- E. The logic board shall be mounted for ease of testing, service and replacement. It shall have quick disconnect plug-in connectors for current transformer inputs, line and load voltage inputs and SCR gate firing output circuits.

- F. The logic board shall be identical for all ampere ratings and voltage classes and shall be conformally coated to protect environmental concerns.
- G. The paralleling run bypass contactor shall energize when the motor reaches 90 of full speed and close/open under one (1) times motor current.
- H. The paralleling run bypass contactor shall utilize an intelligent coil controller to limit contact bounce and optimize coil voltage during varying system conditions.
- I. Starter shall be provided with electronic overload protection as standard and shall be based on inverse time-current algorithm. Overload protection shall be capable of being disabled during ramp start for long acceleration loads via a DIP switch setting on the device keypad.
- J. Overload protection shall be adjusted via the device keypad and shall have a motor full load ampere adjustment from 30 to 100% of the maximum continuous ampere rating of the starter.
- K. Starter shall have selectable overload class setting of 5, 10, 20 or 30 via a DIP switch setting on the device keypad.
- L. Starter shall be capable of either an electronic or mechanical reset after a fault.
- M. Units using bimetal overload relays are not acceptable.
- N. Overtemperature protection (on heat sink) shall be standard.
- O. Starters shall provide protection against improper line-side phase rotation as standard. Starter will shut down if a line-side phase rotation other than A-B-C exists. This feature can be disabled via a DIP switch on the device keypad.
- P. Starters shall provide protection against a phase loss or unbalance condition as standard. Starter will shut down if a 50% current differential between any two phases is encountered. This feature can be disabled via a DIP switch on the device keypad.
- Q. Start shall provide protection against a motor stall condition as standard. This feature can be disabled via a DIP switch on the device keypad.
- R. Starter shall provide protection against a motor jam condition as standard. This feature can be disabled via a DIP switch on the device keypad.

- S. Starter shall be provided with a Form C normally open (NO), normally closed (NC) contact that shall change state when a fault condition exists. Contacts shall be rated 60 VA (resistive load) and 20 VA (inductive load). In addition, an LED display on the device keypad shall indicate type of fault (Overtemperature, Phase Loss, Jam, Stall, Phase Reversal and Overload).
- T. The following control function adjustments on the device keypad are required:
 - 1. Selectable Torque Ramp Start or Current Limit Start
 - 2. Adjustable Kick Start Time: 0–2 seconds
 - 3. Adjustable Kick Start Torque: 0–85%
 - 4. Adjustable Ramp Start Time: 0.5–180 seconds
 - 5. Adjustable Initial Starting Ramp Torque: 0–85%
 - 6. Adjustable Smooth Stop Ramp Time: 0–60 seconds.
- U. Units enclosed in motor control centers shall be of the same manufacturer as that of the circuit breaker and motor control center for coordination and design issues.
- V. Maximum continuous operation shall be at 115% of continuous ampere rating.

2.3 CONTROL RELAYS AND PILOT DEVICES

- A. Solid State and Magnetic Control Relays
 - 1. Description: NEMA ICS 5, solid state relay or Class A300 magnetic control relay.
 - 2. Contacts: Form A or B (or both) as required.
 - 3. Contact Ratings: 10 amperes continuous, minimum.
 - 4. Coil Voltage: 120-volts, 60 Hz.
 - 5. Enclosure: NEMA ICS 6, Type 1.
- B. Time Delay Control Relays (On-Time Delay and Off-Time Delay)
 - 1. Description: NEMA ICS 5, solid-state time delay relay – time delay after energization or after de-energization as indicated on drawings.
 - 2. Contacts: Form A or B (or both) as required.
 - 3. Contact Ratings: 10 amperes continuous, minimum.
 - 4. Coil Voltage: 120-volts, 60 Hz.
 - 5. Enclosure: NEMA ICS 6, Type 1.
- C. Plug-in Control Relays
 - 1. Description: NEMA ICS 5, miniature, hermetically sealed relay.
 - 2. Contacts: 4 pole double throw (4PDT) Form A or B.
 - 3. Contact Ratings: 5 amperes continuous, minimum.
 - 4. Coil Voltage: 120-volts, 60 Hz.

5. Enclosure: Hermetically sealed, suitable for Class 1, Division 1 and 2 installations.
 6. Socket: To match relay and meet conditions of installation.
- D. Switches and Push Buttons:
1. Product Description: NEMA ICS 5, heavy-duty oil-tight.
 2. Contact Ratings: 10 amperes continuous, minimum.
 3. Selector Switches: Rotary type.
 4. Toggle Switches: Honeywell Micro Switch Type TL or approved equal.
 5. Each switch shall have a legend plate – “Hand-Off-Auto”, “Local-Remote”, “Start-Stop”, etc. as required to describe the control mode or function.
- E. Terminal Blocks
1. Description: NEMA ICS 4 terminal blocks.
 2. A Power Terminal is defined as any terminal that is required to carry a current greater than 1 amp or a voltage in excess of 50-volts. Power terminals shall be of the unit construction type with closed back and tubular pressure screw connectors, rated 600 volts minimum, and with a continuous current carrying capacity of 15-amp minimum.
 3. A Signal and/or Control Terminal is defined as any terminal that is required to carry a current that may not exceed 1,000 mA instantaneous and a voltage that is not to exceed 50-volt instantaneous. Signal and/or control terminals may be of the modular construction type, suitable for channel mounting, with tubular pressure screw connectors, rated 300-volts minimum.
 4. Terminal connections shall be made using solid copper conductor. If stranded conductor is to be used, it must be terminated with a “spade” type lug. Stranded wire may not be directly landed on terminal blocks.

2.4 CORROSION PROTECTION

- A. All iron and steel components of the motor control center shall be protected against corrosion by one of the methods specified in UL 845, Paragraphs 57 and 58.
- B. Prepare surfaces for painting. The shop drawings shall include a complete description of motor control center prime and finish painting, including paint manufacturers and types, paint colors, painting processes, and dry film thicknesses.

2.5 SOURCE QUALITY CONTROL

- A. The motor control centers shall be factory-tested in accordance with NEMA standards and ANSI C37.17, together with any additional tests which may be required to ensure that the wiring is correct and that all equipment is in a satisfactory operating condition.

PART 3 INSTALLATION

3.1 INSTALLATION

- A. Motor control center shall be assembled and installed in the location indicated on the drawings in conformance to applicable requirements of the NFPA 70, NECA Standard of Installation and manufacturer's instructions for assembly, leveling and alignment.
- B. All power and control circuits shall be connected to the motor control center as indicated on the drawings. The motor control center shall be grounded in conformance with the requirements of Section 16050 – Basic Electrical Materials and Methods.
- C. Tightening of Connections:
 - 1. The Contractor shall obtain from the manufacturer complete information for tightening of all electrical connections secured with bolts or studs. The information furnished shall include torque wrench settings or complete details of other tightening procedures recommended for bus joints, connector attachments, and contact attachments. Provide this information with the submittals and in the Operation and Maintenance manuals provided to the Owner upon project completion.
 - 2. All electrical connections secured with bolts or studs shall be tightened using a torque wrench or other tightening procedures recommended by the manufacturer for tightening bus joints, connector attachments, and contact attachments.

3.2 COMMISSIONING AND PERFORMANCE TESTING

- A. Commission the equipment and conduct operational tests:
 - 1. Check motor control center electrical circuits for continuity and for short circuits.
 - 2. Check all control devices including interlocks, indicating lights, control relays, timers, time delay relays, and push buttons for correct operation.
 - 3. Verify that all thermal overload heater elements are installed in each motor starter and properly sized for the actual motor full load current.

4. Subsequent to power hookup, energize motor control center and demonstrate functioning of each system in accordance with requirements for the project.

END OF SECTION

SECTION 16500

LUMINAIRES

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes luminaires and accessories.
- B. Related Sections:
 - 1. Section 16050 – Basic Electrical Materials and Methods.
 - 2. Section 16123 – 600-Volt Wire and Cable

1.2 REFERENCES

- A. Illuminating Engineering Society of North America (IESNA)
 - 1. LM-79 – Electrical and Photometric Measurements of Solid State Lighting Products.
 - 2. LM-80 – Measuring Lumen Maintenance of LED Light Sources.
- B. International Organization for Standardization (ISO)
 - 1. 9001 – Quality Management Systems.
- C. National Electrical Manufacturer’s Association (NEMA)
 - 1. SSL-1 – Electronic Drivers for LED Devices, Arrays, or Systems.
- D. Underwriters Laboratories, Inc. (UL)
 - 1. 8750 – Light Emitting Diode (LED) Light Sources for Use in Lighting Products

1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit dimensions, ratings, and performance data.

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.5 MAINTENANCE MATERIALS

- A. In accordance with Division 1 requirements.

PART 2 PRODUCTS

2.1 LED LIGHT FIXTURES

A. General:

1. LED light fixtures shall be in accordance with IES, NFPA, UL, as shown on the drawings, and as specified.
2. LED light fixtures shall be a factory assembled luminaire including all required driver and light engine modules integral to and within a single housing. Lead lengths between driver and light engine shall not exceed 3 feet. Remote luminaire/driver installations are not acceptable.
3. LED light fixtures shall be Reduction of Hazardous Substances (RoHS) compliant.

B. LED Driver Modules

1. Description: Universal voltage switching-mode LED driver module with a rated lifetime of not less than 50,000 hours when operated at an ambient temperature of less than 60-degrees C.
2. Minimum efficiency: 85% at full load.
3. Minimum Operating Ambient Temperature: -20° C (-4° F).
4. Input Voltage: 120V to 277V (±10%) AC at 60Hz. Drivers that require DC input shall include an integral converter that accepts standard line voltage AC.
5. Power Factor: ≥ 0.95.
6. Total Harmonic Distortion: ≤ 20% and meet ANSI C82.11 maximum allowable THD requirements
7. Designed and tested to withstand electrostatic discharges up to 15,000 V without impairment per IEC 801-2.
8. Electrolytic capacitors to operate at least 20 degrees C below the capacitor's maximum temperature rating when the driver is under fully-loaded conditions and case temperature is 62 degrees C.
9. Maximum inrush current of 2 amperes for 120-Volt and 277-Volt drivers.
10. Withstand up to a 4,000 volt surge without impairment of performance as defined by ANSI C62.41 Category A.
11. Inaudible in a 27 dBA ambient.

C. LED Light Engine Modules:

1. Minimum CRI: 70.
2. Color Temperature: 4000K, unless otherwise noted.
3. Minimum Rated Life: 50,000 hours as per LM79.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install surface mounted luminaires plumb and adjust to align with site requirements and with each other. Secure to prevent movement.
- B. Install accessories furnished with each luminaire.
- C. Make wiring connections to branch circuit using wire with insulation suitable for temperature conditions within luminaire.
- D. Ground and bond luminaires in accordance with Section 16050.

3.2 FIELD QUALITY CONTROL

- A. In accordance with Division 1 requirements.
- B. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

3.3 CLEANING

- A. In accordance with Division 1 requirements.
- B. Remove dirt and debris from enclosures and clean photometric control surfaces as recommended by manufacturer.
- C. Clean finishes and touch up damage.

3.4 PROTECTION OF FINISHED WORK

- A. In accordance with Division 1 requirements.

END OF SECTION