

PROJECT MANUAL

FOR

REPLACEMENT OF
LOS VENADOS STANDPIPE

FOR THE

CITY OF EDINBURG



2019

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City of Edinburg
415 W. University Drive
Edinburg, Texas 78539
(956) 388-8211

Document 00001

TITLE SHEET

PROJECT MANUAL
FOR
CITY OF EDINBURG
REPLACEMENT OF
LOS VENADOS STANDPIPE
FOR

EDINBURG, TEXAS

CITY ENGINEER

DATE

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Document 00003

TABLE OF CONTENTS

<u>Document</u>	<u>Title</u>	<u>No. of Pages</u>
INTRODUCTORY INFORMATION		
00001	Title Sheet.....	2
00003	Table of Contents.....	4
00004	List of Drawings	30
00010	Request For Bids	2
00020	Notice to Bidders.....	4
00100	Instruction to Bidders	10
BIDDING REQUIREMENTS		
BID FORMS		
00300	Intent to Respond.....	2
00310	Form of Proposal.....	4
SUPPLEMENTS TO BID FORMS		
00405	Schedule of Unit Price Work	2
00411	Bid Bond	4
00420	Statement of Bidders Qualifications.....	15
00423	Certificate of Bidder's Experience & Qualifications	2
00425	Equipment & Material Suppliers List	4
00429	Non-Bribery Model Form.....	3
POST-BID PROCEDURES		
00450	Post Bid Procedures	2
00460	Noncollusion Affidavit.....	2
CONTRACT FORMS		
00500	Agreement.....	10
00510	Notice of Award.....	3
00550	Notice to Proceed	2
00610	Performance Bond	4
00620	Payment Bond	4
00625	Affidavit of Insurance	2
00630	Forms of Business	2
00631	Resolution of Corporation	2
00632	Contractor's Resolution on Authorized Representative	2
00635	Contractor's Act of Assurance	2
00640	Certification Regarding Department Suspension and Other Responsibility Matters.....	2
CONDITIONS OF THE CONTRACT		
GENERAL		
00700	Standard General Conditions of Construction Contract.....	78
SUPPLEMENTARY CONDITIONS		
00800	Supplementary Conditions of the Construction Contract	13
00811	Wage Rates	2

00830	Warranty.....	4
-------	---------------	---

ADDENDA

00900	Addenda (For filing)	4
00910	Modifications	2

(For filing) Documents listed "for filing" are to be provided by the Bidder and are not included in this Project Manual unless indicated for example only. The Document numbers and titles hold places for actual documents to be submitted by the Contractor during the bid, post-bid, or construction phase of the Project.

*1 For newspaper publication; not included as part of Project Manual.

SPECIFICATIONS**DIVISION 1 – GENERAL REQUIREMENTS**

01010	Summary of Work	1
01060	Regulatory Requirements	3
01152	Applications for Payment	2
01153	Change Order Procedures	2
01200	Project Meetings	2
01300	Submittals and Substitutions.....	5
01310	Construction Schedule	1
01320	Daily Construction Progress Report.....	1
01380	Construction Photographs	1
01400	Testing Laboratory Services	2
01530	Barriers.....	1
01700	Contract Closeout	3
01710	Cleaning	2
01720	Project Record Documents	2
01730	Operating and Maintenance Data	3
01740	Warranties and Bonds	1
01 57 13	Temporary Erosion and Sediment Control.....	2
01 73 29	Cutting and Patching.....	2

DIVISION 2 – EXISTING CONDITIONS

02220	Demolition	5
02 41 19	Selective Site Demolition	4

DIVISION 3 – CONCRETE

03 10 00	Concrete Forming and Accessories.....	4
03 20 00	Concrete Reinforcing	2
03 30 00	Cast in Place Concrete	14
03 39 00	Concrete Curing.....	2

DIVISION 5 – METALS

05 12 00	Structural Steel	10
05 50 00	Miscellaneous Metals.....	6

DIVISION 22 – PLUMBING

22 12 19	Facility Ground- Mounted, Potable-Water Storage Tanks	11
----------	---	----

DIVISION 31 – EARTHWORK

31 00 00	Earthwork	4
31 10 00	Site Cleaning.....	3
31 11 00	Cleaning and Grubbing	2
31 14 11	Earthwork and Related Work	6

31 23 00 Excavation and Fill	6
31 23 16 Excavation	2
31 31 16 Termite Control	2

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 11 00 Base Courses	3
32 13 13 Concrete Paving	5
32 16 12.01 Surface Preparation	2

DIVISION 34 – TRANSPORTATION

34 41 16 Traffic Control Equipment	1
--	---

TCEQ

Texas Commission on Environmental Quality Water Distribution System General Construction Notes	4
Texas omission on Environmental Quality Water Storage Tank General Construction Notes	2

DIVISION 26 – ELECTRICAL

26 02 00 Basic Materials and Methods	18
26 03 00 Demolition Work	3
26 05 19 Wire, Cable and Related Materials	5
26 05 26 Grounding	3
26 05 33 Raceways	7
26 27 26 Wiring Devices	6
26 28 16 Safety and Disconnect Switch	3
26 51 00 Lighting Fixtures	4

DIVISION 33 – UTILITIES

33 12 23 Pumps and Controls and Package Systems	13
---	----

END OF DOCUMENT

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Document 00004

LIST OF DRAWINGS

The list of Drawings is provided on the Sheet Index page for Replacement of Los Venados Standpipe

CS	Cover Sheet
C1	Civil General Notes
C2	Existing Conditions Layout
C3	Demolition Plan Layout
C4	New Site Plan Layout
C5	New Utilities Plan Layout
C6	Paving & Grading Plan
S1	Structural General Notes
S2	Ground Storage Tank Elevation
ES1.0	Existing Electrical Site Plan
ES2.0	New Electrical Plan
E3.0	Electrical Riser & Load Schedule
E4.0	One-Line & Panel
E4.1	Electrical Schematics
E5.0	Details

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REQUEST FOR BIDS

The City of Edinburg is soliciting sealed Request for Bids; hereinafter referred to as RFB, to be received by the City Secretary's Office located at 415 W. University Drive, Edinburg, Texas 78539. City of Edinburg normal business days are Monday through Friday between the hours of 8:00 a.m. to 5:00 p.m. and shall be closed on recognized holidays. A **pre-proposal conference** will be conducted by the Owner /Engineer on August 12, 2019 at 10:30 a.m. The pre-bid proposal conference shall be conducted at the City of Edinburg Engineering Conference Room: located at 415 W. University Drive Edinburg, Texas 78539. Attendance by prospective Bidders is recommended for all general contractors submitting bids. Sub-contractors, suppliers, and equipment suppliers may attend.

RFP'S will be received until 3:00 p.m. Central Time, on Monday, August 19, 2019, shortly thereafter all submitted RFP'S will be gathered and taken to the Edinburg City Hall Community Room, 1st Floor, to be publicly opened and read aloud. Any RFP received after the closing time will not be accepted and will be returned to the submitter unopened. It is the responsibility of the submitter to see that any RFP submitted shall have sufficient time to be received by the City Secretary's Office prior to the RFP opening date and time. The receiving time in the City Secretary's Office will be the governing time for acceptability of the RFP's. RFP's will not be accepted by telephone or facsimile machine. All RFP'S must bear original signatures and figures. The RFP shall be for:

RFB # 2019-82 REPLACEMENT OF LOS VENADOS STANDPIPE

Bidders receiving a "NOTICE TO BIDDERS" and/or "REQUEST FOR BIDS" notice in the mail or reading same in the newspaper are advised that the bidding documents may be obtained from the City of Edinburg web page address: www.cityofedinburg.com, or may obtain copies by contacting the office of: LORENA FUENTES, PURCHASING AGENT, LOCATED AT 415 W. UNIVERSITY DRIVE, EDINBURG, TEXAS 78539 by calling (956) 388-1895 or by emailing your request to the following address: lfuentes@cityofedinburg.com. General and/or Prime Contractors submitting bids and/or proposals to the City of Edinburg shall be non-refundable.

Plans, proposal forms, specifications, and contract documents may be purchased from the Engineering Department, Engineer of Record or are available for printing at http://cityofedinburg.com/departments/finance/open_bid_notices.php. Copies of the plans and specifications may be examined without charge at the following location:

City of Edinburg
Engineering Department – 2nd Floor
415 W. University Drive
Edinburg, Texas 78539

Hand Delivered RFB'S:

415 W. University Drive
C/o City Secretary Department (1st Floor)

If using Land Courier (i.e. FedEx, UPS):

City of Edinburg
C/o City Secretary
415 W. University Drive
Edinburg, Texas 78539

If Mailing Proposals:

City of Edinburg
C/o City Secretary
P.O. Box 1079
Edinburg, Texas 78540-1079

The City of Edinburg reserves the right to refuse and reject any or all RFP's and to waive any or all formalities or technicalities and to accept the RFP deemed most advantageous to the City, and hold the RFP's for a period of 90 days without taking action.

RFP's must be submitted in an envelope sealed with tape and prominently marked on the lower left hand corner of the envelope with corresponding RFP number and title.

Please read your requirements thoroughly and be sure that the RFP offered complies with all requirements/specifications noted. Any variation from the solicitation requirements/specifications must be clearly indicated by letter, on a point by point basis, attached to and made a part of your RFP. If no exceptions are noted, and you are the successful respondent, it will be required that the service(s) be provided as specified.

PURPOSE

(1) The purpose of these solicitation documents is to provide a proposal for drainage improvements consisting of drainage pipe, inlets and manholes installation for:

REPLACEMENT OF LOS VENADOS STANDPIPE

INTENT

(2) The services to be provided under this RFP shall be in accordance with and shall meet all specifications and/or requirements as shown in this solicitation for RFP. There is no intention to disqualify any respondent who can meet the requirements.

SUBMITTAL OF RFP

(3) RFPs shall be submitted in sealed envelopes as referenced on the attached solicitation. Five (5) complete sets of the response, one (1) original marked "**ORIGINAL**," and four (4) copies marked "**COPY**". RFPs submitted by facsimile (fax) or electronically shall **NOT** be accepted. Submittal of an RFP in response to this solicitation constitutes an offer by the respondent. Once submitted, RFP's become the property of the City of Edinburg and as such the City reserves the right to use any ideas contained in any RFP regardless of whether that respondent/firm is selected. Submission of a RFP in response to this solicitation, by any respondent, shall indicate that the respondent(s) has/have accepted the conditions contained in the RFP, unless clearly and specifically noted in the RFP submitted and confirmed in the contract between the City and the successful respondent otherwise. RFPs which do not comply with these requirements may be rejected at the option of the City. RFPs must be filed with the City of Edinburg before the deadline day and hour. No late RFPs will be accepted. They will be returned to respondent unopened (if properly identified). Failure to meet RFP requirements may be grounds for disqualification.

Hand Delivered RFP'S:

415 W. University Drive
c/o City Secretary Department (1st Floor)

If using Land Courier (i.e. FedEx, UPS):

City of Edinburg

c/o City Secretary
415 W. University Drive
Edinburg, Texas 78541

If Mailing RFP's:

City of Edinburg
c/o City Secretary
P.O. Box 1079
Edinburg, Texas 78540-1079

RFP DOCUMENTS: Copies of the RFP Documents, including Drawings, Contract Documents and Technical Specifications may be obtained at Hinojosa Engineering, Inc. at 108 W. 18th Street, Mission, Texas 78572 office for a ***non-refundable*** deposit of \$100.00 payable to Hinojosa Engineering, Inc.

TIME ALLOWED FOR ACTION TAKEN

(4) The City of Edinburg may hold RFP/s 90 days after deadline without taking action. Respondents are required to hold their RFP/s firm for same period of time.

RIGHT TO REJECT/AWARD

(5) The City of Edinburg reserves the right to reject any or all RFPs, to waive any or all formalities or technicalities, and to make such awards of contract as may be deemed to be the best and most advantageous to the City of Edinburg.

ASSIGNMENT

(6) Respondents are advised that the City of Edinburg shall not allow the successful respondent to sell, assign, transfer, or convey any part of any contract resulting from this RFP in whole or in part, to a third party without the written approval of the City of Edinburg.

AWARD

(7) Respondents are advised that the City of Edinburg is soliciting RFPs and award shall be made to the respondent that in the opinion of the City of Edinburg is the best qualified.

NUMBER OF CONTRACTS

(8) THE CITY reserves the right to award one or no contract in response to this RFP.

STATUTORY REQUIREMENTS

(9) It shall be the responsibility of the successful respondent to comply with all applicable State & Federal laws, Executive Orders and Municipal Ordinances, and the Rules and Regulations of all authorities having jurisdiction over the work to be performed hereunder and such shall apply to the contract throughout, and that they will be deemed to be included in the contract as though written out in full in the contract documents.

ALTERATIONS/AMENDMENTS TO RFP

(10) RFP **CANNOT** be altered or amended after opening time. Alterations made before opening time must be initialed by respondent guaranteeing authenticity. No RFP may be withdrawn after opening time without acceptable reason in writing and only after approval by the City of Edinburg.

NO RESPONSE TO RFP

(11) If unable to submit a RFP, respondent should return inquiry giving reasons.

LIST OF EXCEPTIONS

(12) The respondent shall attach to his/her RFP a list of any exceptions to the specifications/requirements.

PAYMENT

(13) The City of Edinburg will execute payment by mail in accordance with the State of Texas Pay Law after SERVICES have been completed, introduced to the City, and found to meet City of Edinburg specifications/requirements. No other method of payment will be considered.

SYNONYM

(14) Where in this solicitation package SERVICES is used, its meaning shall refer to the request for the South East Original Drainage Improvements as specified.

RESPONDENT'S EMPLOYEES

(15) Neither the Respondent nor his/her employees engaged in fulfilling the terms and conditions of this Service Contract shall be considered employees of the City. The method and manner of performance of such undertakings shall be under the exclusive control of the vendor on contract. The City shall have the right of inspection of said undertakings at any time.

INDEMNIFICATION CLAUSE

(16) The Respondent agrees to indemnify and save harmless the City, from all suits and actions of every nature and description brought against them or any of them, for or on account of the use of patented appliances, products or processes, and he shall pay all royalties and charges which are legal and equitable. Evidence of such payment or satisfaction shall be submitted upon request of the Purchasing Agent, as a necessary requirement in connection with the final estimate for payment in which such patented appliance, products or processes are used

INTERPRETATIONS

(17) Any questions concerning the project and/or specifications/requirements with regards to this solicitation for statement(s) of qualifications shall be directed to the designated individuals as outlined in the RFP. Such interpretations, which may affect the eventual outcome of this request for statements of qualifications, shall be furnished in writing to all prospective Respondents via Addendum. No interpretation shall be considered binding unless provided in writing by the City of Edinburg in accordance with paragraph entitled "Addenda and Modifications".

VERBAL THREATS AND OFFICIAL CONTACT

(18) Any threats made to any employee of the City, be it verbal or written, to discontinue the providing of item/material/services for whatever reason and/or reasons shall be considered a breach of contract and the City will immediately sever the contract with the Respondent/Consultant on contract.

Respondents shall not offer gratuities, favors or any monetary value to any official or employee of the City for purpose of influencing the selection. Any attempt by any Respondent to influence the selection process by any means, other than disclosure of qualifications and credentials through the proper channels, shall be grounds from exclusion from the selection process. Once the project is

advertised, there shall be no contact with any city official or employee unless using the formal process through the Purchasing Department. Failure to comply will result in the firm being disqualified from the process.

Questions and answers that change or substantially clarify the Request for Proposals will be affirmed in writing and copies will be provided to all firms on record responding to RFP. Any inquiries to this RFP must be submitted Ms. Lorena Fuentes, Purchasing Agent, at (956) 388-1895 or at the following e-mail address: lfuentes@cityofedinburg.com no later than **August 14, 2019 by 5:00 pm.**

CONFIDENTIAL INFORMATION

(19) Any information deemed to be confidential by the respondent should be clearly noted on the pages where confidential information is contained; however, the City cannot guarantee that it will not be compelled to disclose all or part of any public record under Texas Public Information Act, since information deemed to be confidential by the respondent may not be considered confidential under Texas Law, or pursuant to a Court order.

PAST PERFORMANCE

(20) Respondent's past performance shall be taken into consideration in the evaluation of RFP submittal.

JURISDICTION

(21) Contract(s) executed as part of this solicitation shall be subject to and governed under the laws of the State of Texas. Any and all obligations and payments are due and performable and payable in Hidalgo County, Texas.

RIGHT TO AUDIT

(22) The City of Edinburg reserves the right to audit the vendor's books and records relating to the performance of this contract. The City of Edinburg, at its own expense, shall have the right at all reasonable times during normal business hours and upon at least twenty-four (24) hours' advance notice, to audit, to examine, and to make copies of or extracts from the books of account and records maintained by the vendor(s) with respect to the Supply/Service and/or Purchase Contract. If such audit shall disclose overpayment by City to vendor, written notice of such overpayment shall be provided to the vendor and the amount of overpayment shall be promptly reimbursed by vendor to the City. In the event any such overpayment is not paid within ten (10) business days after receipt of such notice, the unpaid amount of such overpayment shall bear interest at the rate of one percent (1%) per month from the date of such notice until paid.

VENUE

(23) The parties agree that venue for purposes of any and all lawsuits, cause of action, and/or any other dispute(s) shall be in Hidalgo County, Texas.

IF YOU HAVE ANY QUESTIONS ABOUT COMPLIANCE, PLEASE CONSULT YOUR OWN LEGAL COUNSEL. COMPLIANCE IS THE INDIVIDUAL RESPONSIBILITY OF EACH PERSON OR AGENT OF A PERSON WHO IS SUBJECT TO THE FILING REQUIREMENT. AN OFFENSE UNDER CHAPTER 176 IS A CLASS "C" MISDEMEANOR.

CONFLICT OF INTEREST

(24) CHAPTER 176 OF THE TEXAS LOCAL GOVERNMENT CODE

Effective January 1, 2006, Chapter 176 of the Texas Local Government Code requires that any vendor or person considering doing business with a local government entity disclose in the Questionnaire Form CIQ, the vendor or person's affiliation or business relationship that might cause a conflict of interest with a local government entity. By law, this questionnaire must be filed with the records administrator of the City of Edinburg not later than the 7th business day after the date the person becomes aware of facts that require the statement be filed. See Section 176.006, Local Government Code. A person commits an offense if the person violates Section 176.006, Local Government Code. An offense under this section is a Class C misdemeanor. For more information or to obtain Questionnaire CIQ go to the Texas Ethics Commission web page at www.ethics.state.tx.us/forms/CIQ.pdf.

CERTIFICATE OF INTERESTED PARTIES (Form 1295)

(25) In 2015, the Texas Legislature adopted [House Bill 1295](#), which added section 2252.908 of the Government Code. The law states that a governmental entity or state agency may not enter into certain contracts with a business entity unless the business entity submits a disclosure of interested parties to the governmental entity or state agency at the time the business entity submits the signed contract to the governmental entity or state agency. The law applies only to a contract of a governmental entity or state agency that either (1) requires an action or vote by the governing body of the entity or agency before the contract may be signed or (2) has a value of at least \$1 million. The disclosure requirement applies to a contract entered into on or after January 1, 2016. For more information go to the Texas Ethics Commission web page at www.ethics.state.tx.us/forms/CIQ.pdf.

CONFIDENTIALITY OF INFORMATION AND SECURITY

(26) Should the successful respondent become the holder of and have access to confidential information in the process of fulfilling its responsibilities in connection with an awarded contract the successful respondent agrees that it shall keep such information confidential and will comply fully with the laws and regulations of the State of Texas, ordinances and regulations of the City, and any applicable federal laws and regulations relating to confidentiality.

TERMINATION OF CONTRACT

(27) The City of Edinburg reserves the right to terminate the contract if, in the opinion of the City of Edinburg, the successful vendor's performance is not acceptable, no funds are available, or if the City wishes, without cause, to discontinue this contract. Termination will be in written form allowing a 30-day notice.

RESPONSE DEADLINE

(28) Responses to the RFP must be addressed to City Secretary, City of Edinburg, 415 W. University Drive by **Monday, August 19, 2019 until 3:00 p.m.** for consideration. **An (1) original and four (4) copies** of complete sets of the response must be submitted no later than this date and time in a sealed envelope indicating that its contents are in response to the RFP for the "Replacement of Los Venados Standpipe". Respondents are advised that all confidential records must be submitted in a separate sealed envelope and marked accordingly.

Hand Delivered RFP's:

415 W. University Drive

c/o City Secretary Department (1st Floor)

If using Land Courier (i.e. FedEx, UPS):

City of Edinburg
c/o City Secretary
415 W. University Drive
Edinburg, Texas 78541

If Mailing RFPs:

City of Edinburg
c/o City Secretary
P.O. Box 1079
Edinburg, Texas 78540-1079

ADDENDA AND MODIFICATIONS

(29) Any changes, additions, or clarifications to the RFP are made by amendments (addenda). Any respondent in doubt as to the true meaning of any part of the RFP or other documents may request an interpretation from the Purchasing Division. At the request of the respondent, or in the event the Purchasing Division deems the interpretation to be substantive, the interpretation will be made by written addendum. Said Addenda shall be mailed, e-mailed, hand delivered and/or faxed, to all prospective respondents. All Addenda issued in respect to this RFP shall be considered official changes to the original documents. Verbal statements in response to inquiries and/or requests for explanations shall not be authoritative or binding. It shall be the respondent's responsibility to ensure that they have received all Addenda in respect to this project. Furthermore, respondents are advised that they must recognize, comply with, and attach a signed copy of each Addendum which shall be made part of their RFP Submittal. Respondent(s) signature on Addenda shall be interpreted as the respondent's "recognition and compliance to" official changes as outlined by the City of Edinburg and as such are made part of the original solicitation documents. Failure of any respondent to receive any such addendum or interpretation shall not relieve such respondent from its terms and requirements. The City may issue a written addendum no later than five calendar days prior to the date bids must be received. Addendums are available online at www.cityofedinburg.com.

RFP PREPARATION COSTS

(30) The City of Edinburg shall not be held liable for any costs incurred by any respondent for work performed in the preparation of and production of a RFP or for any work performed prior to execution of contract.

EQUAL EMPLOYMENT OPPORTUNITY

(31) Respondent agrees that they will not discriminate in hiring, promotion, treatment, or other terms and conditions of employment based on race, sex, national origin, age, disability, or in any way violate Title VII of 1964 Civil Rights Act and amendments, except as permitted by said laws.

AUTHORIZATION TO BIND RESPONDENT TO RFP

(32) RFPs MUST give full firm name and address of respondent, and be manually signed. Failure to do so will disqualify your RFP. Person signing bid must show title or AUTHORITY TO BIND HIS/HER FIRM IN A CONTRACT. Firm name and authorized signature must appear on each page that calls for this information. The legal status of the Respondent whether corporation, partnership,

or individual, shall also be stated in the RFP. A corporation shall execute the RFP by its duly authorized officers in accordance with its corporate by-laws and shall also list the state in which it is incorporated. A partnership Respondent shall give full names and addresses of all partners. All partners shall execute the RFP. Partnership and Individual Respondent shall state in the proposal the names and addresses of all persons with a vested interest therein. The place of residence of each Respondent, or the office address in the case of a firm or company, with county and state and telephone number, shall be given after the signature.

BRAND OR MANUFACTURER REFERENCE

(33) Unless otherwise specified, any catalog or manufacturer's reference or brand name used in describing an item is merely descriptive, and not restrictive, and is used only to indicate type and style of product desired. Proposals on alternate brands will be considered if they meet specification requirements. If a bidder quotes on equipment other than the one(s) specified in the bid, sufficient specifications and descriptive (pictured literature) data must accompany same to permit thorough evaluation. In the absence of these qualifications, he/she will be expected to furnish the product called for.

COOPERATIVE PRICING

(34) Bidders are advised that in addition to responding to our "local" solicitation for bids/Bids with Dealer pricing, vendors/contractors are encouraged to provide pricing on the below referenced items/products/services based on BuyBoard, TX-MAS, H-GAC and/or any other State of Texas recognized and approved cooperative which has complied with the bidding requirements for the State of Texas. If bidding other than or in addition to "dealer" pricing, kindly duplicate the bid forms for each bid being provided from a cooperative contract. Any and all applicable fees must be included. All cooperative pricing must be submitted on or before bid opening date and hour.

HB 89

(35) The 85th Texas Legislature approved new legislation, effective Sept. 1, 2017, which amends Texas Local Government Code Section 1. Subtitle F, Title 10, Government Code by adding Chapter 2270 which states that a governmental entity may not enter into a contract with a company for goods or services unless the contract contains a written verification from the company that it:

- 1) does not boycott Israel; and
- 2) will not boycott Israel during the term of the contract

Confidential Information Respondents are advised that all confidential records must be submitted in a separate sealed envelope and marked accordingly.

SECTION I SCOPE OF THE PROPOSAL

INTRODUCTION

The purpose of the RFP is to solicit and obtain from interested parties (also referred to herein as "Vendor" or "Vendors") the best possible proposal for the REPLACEMENT OF LOS VENADOS STANDPIPE. The City of Edinburg intends to select the most competitive proposal that meets the City's requirements and specifications listed within the proposal and then enter into negotiations with the Vendor/s for purposes of reaching a satisfactory agreement for the City for the REPLACEMENT OF LOS VENADOS STANDPIPE.

BACKGROUND

The City of Edinburg REPLACEMENT OF LOS VENADOS STANDPIPE project will mitigate drainage issues occurring within the project area.

SCOPE OF WORK

The City is soliciting competitive proposals from experienced and qualified companies for the REPLACEMENT OF LOS VENADOS STANDPIPE. The project will improve the drainage in the area.

ADDITIONAL INFORMATION

The City of Edinburg is requesting that RFP's (Request for Proposal) be routed to: The CITY Secretary, at 415 West University, Edinburg, Texas 78541.

NON-COLLUSION

Submitters, by submitting a signed submission, certify that the accompanying submission is not the result of, or affected by, any unlawful act of collusion with any other person or company engaged in the same line of business or commerce, or any other fraudulent act punishable under Texas or United States law.

NON-DISCRIMINATION

Submitters, during the performance of this contract, will not discriminate against any employee or applicant for employment because of race, religion, sex, national origin or disability except where religion, sex, national origin or disability is a bona fide occupational qualification reasonably necessary to the normal operation of the contractor.

PROCESSING TIME FOR PAYMENT

Submitters are advised that a minimum of thirty (30) days is required to process invoices for payment.

ELECTRONIC SUBMISSION OF BIDS

The City of Edinburg's City Secretary Department will not accept telegraphic or electronically transmitted submissions.

PROOF OF FINANCIAL AND BUSINESS CAPABILITY

Submitters must, upon request, furnish satisfactory evidence of their ability to furnish products or services in accordance with the terms and conditions of these requirements. The CITY will make the final determination as to the submitter's ability.

SUBMITTER DEFAULT

The City of Edinburg reserves the right, in case of submitter default, to procure the articles or services from other sources and hold the defaulting submitter responsible for any excess costs occasioned thereby.

RESTRICTIVE OR AMBIGUOUS REQUIREMENTS

It is the responsibility of the submitter to review the Request for Proposals (RFP) packet and to notify the City Engineering Department if the requirements are formulated in a manner that would unnecessarily restrict competition. Any such protest or question regarding the requirements or bidding procedures must be received in the City Secretary Department not less than seventy-two hours prior to the time set for the opening. These criteria also apply to requirements that are ambiguous.

RFP DELIVERY

The City of Edinburg requires submitters, when hand-delivering proposals by **3:00 pm on August 19, 2019**, to have a City Secretary Department representative time/date stamp and initial the envelope.

SIGNING OF PROPOSALS

In order to be considered, all submittals **must** be signed.

WAIVING OF INFORMALITIES

THE CITY reserves the right to waive minor informalities or technicalities when it is in the best interest of THE CITY.

SUBCONTRACTING

The successful submitter may not subcontract the award without the written consent of the City.

BIDDER RESPONSIBILITY

It is the responsibility of each vendor before submitting a proposal:

- To examine thoroughly the contract documents and other related data identified in the proposal documents.
- To visit the site to become familiar with and satisfy vendor as to the general, local, and site conditions that may affect cost, progress, performance, etc.
- To consider federal, state, and local laws and regulations that may affect costs, progress, performance or furnishing of the work.
- To study and carefully correlate vendor's knowledge and observations with the contract documents and such other related data.
- To promptly notify THE CITY Purchasing of all conflicts, errors, ambiguities, or discrepancies which vendor has discovered in or between the contract documents and such

other related documents.

TERMINATION

THE CITY has the authority and express right to terminate any Agreement awarded under this RFP or any Work Order resulting from the Agreement at any time for any reason, including but not limited to, instances where THE CITY finds that the Contractor's work is negligent, not satisfactory, or not in accordance with the Agreement requirements.

SECTION II RFP REQUIREMENTS

PURPOSE

The intent of this Request for Proposal and resulting contract is to obtain proposals to REPLACEMENT OF LOS VENADOS STANDPIPE.

REQUEST FOR PROPOSALS

The required contents and limitations for the preparation of the RFP are described in this section. Failure to provide the requested information or adhere to any of The CITY limitations will result in disqualification of the submitted RFP. A total of **one (1) original and four (4) copies** of the RFP shall be submitted to the address on the cover letter. Letter of Intent from Surety Company to provide Payment and Performance Bonds shall also be required from the proposer as part of RFP.

SUBMITTAL

For proper comparison and evaluation, THE CITY requests that proposals address, at a minimum, the following format.

- 1) **Cover Letter** - A brief introductory letter of representation.
- 2) **Executive Summary** - A brief summary highlighting the most important points of the proposal. If used, the Summary should not exceed five pages.
- 3) **Degree of Compliance** - A statement that all products and services quoted in proposal is in full accord with the specifications or a brief listing of all those specification sections to which the Proposer takes exception. All explanations, exceptions, comments, etc., pertaining to the specific sections of the specifications shall be listed and numbered in order of the respective article of the specification.

CONTENTS

The required contents for the RFP are presented below in the order they should be incorporated into the submitted document.

- 1) **UNDERSTANDING OF THE PROJECT:** This section should demonstrate the submitter's understanding of the project's needs, the work required, and any local issues or concerns. This description should be concise, candid, and limited to 2 pages in length.
- 2) **FIRM QUALIFICATIONS, PERSONNEL AND STAFFING (00420 Statement of Bidder's Qualifications):** The CITY is seeking a contract with a competent firm(s); with a minimum of 5 years' experience of installation of the REPLACEMENT OF LOS VENADOS STANDPIPE
 - a) **Qualifications:**
 - i) List Firm's qualifications and ability to perform the service requirements.
 - ii) List qualifications of key personnel to be assigned to this project, including but not limited to education, training, registrations, certifications and licenses.

b) Experience:

- i) Number of years of experience as a General Contractor.
- ii) Relevant experience with projects of similar size and scope performed over the past five (5) years. For each project listed, date services provided and name, titles, and telephone numbers of each client or client's representative.
- iii) Specific experience with public entity clients, especially large municipalities. If company submitting proposal for new construction has provided services to the CITY in the past, identify the name of the project and the department for which services were provided.
- iv) If company submitting proposal for this project is submitting as a team or joint venture, provide the same information for each member of the team or joint venture.
- v) Provide the following information for key personnel to be assigned to this project:
 - (1) Total years' experience.
 - (2) Primary work assignment for the projects outlined in this RFP.
 - (3) Relevant experience with projects of similar size and scope.

c) Previous Project Performance:

- i) Provide evidence of satisfactory performance on past projects
- ii) List past assignments over the past five (5) years
- iii) Provide copies of outstanding service letters, letters of commendation, service awards, etc.
- iv) Provide five recent references who may be contacted to verify performance of similar services. For each reference, provide a current phone number and e-mail address. References may not be present or former CITY employees.

d) Quality of Service:

- i) Company submitting proposal for the REPLACEMENT OF LOS VENADOS STANDPIPE – Availability: Identify any concurrent or near future commitment that would impede the firm's ability to perform this contract.
- ii) Describe company submitting proposal for the REPLACEMENT OF LOS VENADOS STANDPIPE policies, procedures and plans to ensure quality services (continuing education, on-going training, internal quality practices, etc.)
- iii) If company submitting proposal for the REPLACEMENT OF LOS VENADOS STANDPIPE has ever had a contract terminated or has been dismissed due to alleged unsatisfactory performance, state when, where and why the contract was terminated and/or Security Consultant dismissed, the client's name, and the contact person's phone number.

- 3) **Proposal Pricing/Delivery** - Pricing shall be inclusive for all items requested in this proposal. Brief notes referencing specific line items may be included, if necessary, for explanation. Proposal shall state all labor, materials and equipment necessary to complete the project as stated in the SCOPE OF WORK (Page 2).
- 4) **Contractor Background Information** - This section should include a description of the Proposer experience with other services similar to the one described herein. This information should include scope of several similar jobs including magnitude and cost, customer contacts and other information that THE CITY can use as a basis for performance evaluation. This section should also include information on your organization and staff assigned to the project.
- 5) **References** - Proposer shall submit with this proposal a list of at least three (3) references where like services or similar projects have been performed by their firm. Include name of firm, address, telephone number and name of representative.
- 6) **Schedule** – Proposer shall submit the amount of working days that will take company to complete project.

SECTION III SELECTION AND SCHEDULES

SELECTION PROCEDURES

The RFP shall be submitted according to the schedule below.

PROPOSAL RANKING

A selection committee will evaluate and rank the written RFPs on a per project basis. After the RFPs have been ranked, the committee will make a recommendation to the CITY Council.

RFP SUBMITTED TO

An original and four (4) copies of RFPs should be submitted to:

City of Edinburg
c/o City Secretary
415 West University
P.O. Box 1079
Edinburg, Texas 78541

RFPs must be submitted by no later than 3:00 p.m. on Monday August 19, 2019.

SECTION IV FIRM and RFP EVALUATION

RFP – EVALUATION

The evaluation system consists of a 100 Point system. The RFP will be ranked after evaluation. All RFP's submitted will be ranked and evaluated based on specified RFP criteria. The submittal evaluation will be based on the following criteria.

- **40 Points: Proposer's itemized and total proposed price**
 - Total estimated cost for base bid submitted*

*Alternates might be included based on what is most advantageous to City.
- **40 Points: Proposer's qualifications/experience and performance/references**
 - Demonstrated prior experience for similar projects (20 points)
 - Number of years in business (5 points)
 - Litigation History/Lawsuit History (5 points)
 - References (10 points)
- **10 Points: The Proposer's Team and Subcontractors.**
 - Resumes for Key Individuals (5 points)
 - Project Superintendent
 - Project Manager
 - List of Subcontractors (5 points)
- **10 Points: Schedule.**
 - Lowest total days (10 points)
 - Within 30 days of lowest (8 points)
 - Within 60 days of lowest (6 points)
 - More than 60 days from lowest (5 points)

Proposed Price (40 points):

The price will be evaluated and scored based on the main proposal cost. The City reserves the right to include any and all alternate price proposals in the price evaluation process. The established budget will determine which, if any, alternates will be recommended and accepted as part of the overall price ranking evaluation. After the highest ranked firm is selected, negotiations on price and changes on the scope of work may occur with the firm that provides the best value to the City.

Points will be awarded based upon the total number of offers submitted. The lowest offeror will receive the maximum number of points and the highest offeror will receive the minimum number of points. A point spread system will be established once all the offers are tabulated. The closer the prices of the offers, the larger the point spread will be.

SAMPLE: Utilizing the 80% Spread Formula

Contractor	Price	Points
Offeror No. 01	\$1,000,000.00	40.0
Offeror No. 02	\$1,050,000.00	37.33
Offeror No. 03	\$1,100,000.00	34.67
Offeror No. 04	\$1,150,000.00	32.0

70% spread: $40 \times 70\% = 28.0$ points Results: 12 points spread
75% spread: $40 \times 75\% = 30.0$ points Results: 10 points spread
80% spread: $40 \times 80\% = 32.0$ points Results: 8 points spread
85% spread: $40 \times 85\% = 34.0$ points Results: 6 points spread
90% spread: $40 \times 90\% = 36.0$ points Results: 4 points spread
95% spread: $40 \times 95\% = 38.0$ points Results: 2 points spread

If the committee decided to utilize the 90% spread formula, Offeror No. 04 is only 4 points away from Offeror No. 1. The committee may feel that a 4 point difference is too close, and is unfair to the lowest price offeror. A 70% spread, or 12 point difference, may be too far spread out and may be considered unfair to the highest price offer. Especially since the prices are not too far apart on a \$1 Million project. The point spread could be very different on a \$300,000.00 project budget versus a \$30 million project budget.

After the percentage spread is agreed upon, in this case the 80% formula, the lowest offeror gets the maximum 40 points and the highest offeror gets 32 points. Everyone else in the middle will get their points scored proportionately (extrapolated). This is the scoring system which will be utilized by the ranking committee on the price category for all construction projects. The point system will vary from project to project depending on the project budget ranges, on the number of offers submitted, and on the price spread differences between all offerors.

RESPONDENT – EVALUATION

The evaluation system consists of a 100-point system. The firms will be ranked after evaluation. Categories under the 100-point system include response to RFP. RFP submittal evaluation will be based on the following criteria.

STAFFING OF PROJECT TEAM

The firms should provide information on their proposed professional team members, i.e., applicable certifications/registrations and other pertinent information that demonstrates their qualifications to perform the contract. The professional team members shall have experience in performing similar contracts for counties, cities, irrigation districts, TX DOT or other clients as stated in the Request for Proposals (RFP). Similar experience gained through other clients should be substantiated by reference. A list and scope of the various projects for comparative purposes shall be included in an appendix.

EXPERIENCE OF PROJECT TEAM/ABILITY TO COMMIT RESOURCES

The provider shall designate experienced staff to completely and efficiently perform the work. Also, in this section, outline the firm's contingency plans for servicing the project in the event that one or more key personnel are not available for any reason during the period of performance.

METHODOLOGY

The RFP should provide a description of the firm's approach to the methodology and management to the scope of services for the project.

UNDERSTANDING OF PROJECT/SIMILAR PROJECTS

The proposal shall include the following:

1. Address appropriate Federal/State/Local regulations and policies
2. Identify information to be gathered or obtained

The respondents should provide as much background information as to its experience in providing similar services to State, CITY, County or any other governmental agencies. Reference information should be as current as possible, especially contact persons and telephone numbers.

FAMILIARITY WITH APPLICABLE RULES AND REGULATIONS

The RFP should indicate, through past experience of the proposed Team, that they possess sufficient knowledge of governmental regulations, appropriate codes, guidelines, professional standards and policies (as required).

SECTION V

AWARD OF CONTRACT, RESERVATION OF RIGHTS

Number of Contracts

The CITY reserves the right to award one or no contract(s) in response to this RFP.

Advantageous Contract

The Contract/s, if awarded, will be awarded to the vendor/s submitting proposal for the REPLACEMENT OF LOS VENADOS STANDPIPE whose Submittal(s) is/are deemed most advantageous to the CITY and, as determined by the selection committee, upon approval of the CITY Council.

Final Selection and City Council Approval

The CITY may accept any Submittal in whole or in part. If subsequent negotiations are conducted, they shall not constitute a rejection or alternate RFP on the part of THE CITY. However, final selection of a company submitting proposal for the REPLACEMENT OF LOS VENADOS STANDPIPE is subject to City Council approval.

Remedy of Technical Errors

The CITY reserves the right to accept one or more submittals or reject any or all submittals received in response to this RFP, and to waive informalities and irregularities in the submittals received. The CITY also reserves the right to terminate this RFP, and reissue a subsequent solicitation, and/or remedy technical errors in the RFP process.

Preparation Costs

This RFP does not commit the CITY to enter into a Contract, award any services related to this RFP, nor does it obligate the CITY to pay any costs incurred in preparation or submission of a submittal or in anticipation of a contract.

Insurance and Indemnity

If selected, vendor/s submitting proposal for REPLACEMENT OF LOS VENADOS STANDPIPE will be required to comply with the Insurance and Indemnity Requirements established herein.

Independent Contractor

The company/s submitting proposal for the REPLACEMENT OF LOS VENADOS STANDPIPE agrees and understands that, if selected, it and all persons designated by it to provide services in connection with a contract, is (are) and shall be deemed to be (an) independent contractor(s), responsible for its (their) respective acts or omissions, and that THE CITY shall in no way be responsible for company submitting proposal for the REPLACEMENT OF LOS VENADOS STANDPIPE actions, and that none of the parties hereto will have authority to bind the other or to hold out to third parties.

Purchase Orders, As Needed

Execution of a contract does not obligate the CITY to engage any delivery orders, Purchase Orders, or other commitments for services. Service delivery shall be at the CITY's discretion, as needed, and will be communicated to the company submitting proposal for the REPLACEMENT OF LOS VENADOS STANDPIPE through individual Purchase Orders.

ATTACHMENT I

Insurance Requirements

The Respondent awarded the contract shall furnish proof of insurance, which will also include any subcontractor that is subcontracted by the bidder in at least the following limits, to be in place prior to providing any services under this Contract and to continue in effect at all times during the term of this Contract:

- 1 Professional liability insurance policy with limits of at least One Million Dollars (\$1,000,000) per occurrence, or limited to claims made, include at least a five (5) year extended reporting period.
- 1 Automobile liability insurance policy with limits of at least Three Hundred Thousand Dollars (\$300,000) per person and \$500,000 per occurrence consistent with potential exposure to The CITY under the Texas Tort Claims Act. Coverage should include injury to or death of persons and property damage claims (with limits up to \$500,000) arising out of the services provided to The CITY hereunder.
- 1 Uninsured/Underinsured motorist coverage in an amount equal to the bodily injury limits set forth immediately above;
- 1 A Five Hundred Thousand Dollar (\$500,000) Comprehensive General Liability insurance policy providing additional coverage to all underlying liabilities of The CITY consistent with potential exposure of The CITY under the Texas Tort Claims Act;
- 1 Workers' compensation insurance in amounts established by Texas law, unless the Bidder is specifically exempted from the Texas Workers' Compensation Act, Texas Labor Code Chapter 401, et. Seq.

Certificates of insurance naming The CITY as an additional insured shall be submitted to The CITY for approval prior to any services being performed by Contractor. Each policy of insurance required hereunder shall extend for a period equivalent to, or longer than the term of the Contract, and any insurer hereunder shall be required to give at least thirty (30) days written notice to The CITY prior to the cancellation of any such coverage on the termination date, or otherwise. This Contract shall be automatically suspended upon the cancellation, or other termination, of any required policy of insurance hereunder, and such suspension shall continue until evidence that adequate replacement coverage is provided to The CITY. If replacement coverage is not provided within thirty (30) days following suspension of the Contract, the Contract shall automatically terminate.

ATTACHMENT II
Insurance Requirement Acknowledgement

I, _____, authorized representative for
_____,

Company/Vendor

Hereby acknowledge the receipt of The CITY's required insurance limits. Said requirements:

- ☐ Will be acquired within 10 working days after notification from the Engineering Department of proposal awarded by The CITY of Edinburg; (*An insurance certificate for the required insurance limits shall be provided to the City Engineer in order to qualify for award of bid and to execute a contract between the Company and The CITY.)
- ☐ Will acquire additional amount needed to meet The CITY's requirements within 10 working days after notification from the Engineering Department of bid awarded by The CITY of Edinburg; currently carry the following:

Professional Liability (Errors & Omissions):
\$ _____

Automobile Liability: \$ _____ General Liability:
\$ _____

(* An insurance certificate for the required insurance limits shall be provided to the City Engineer in order to qualify for award of bid and to execute a contract between the Company and The CITY.) **OR**

- ☐ Have already been met (see attached copy of insurance certificate).

Authorized Representative

Date

Notice to Bidder: Failure to provide Certificates of Insurance to the City Engineer will cause the bid award to be rescinded and then awarded to next lowest bidder. Certificates of Insurance will be monitored/verified on a **quarterly basis** to ensure that coverage policy is in place. It is the Company's obligation to maintain the appropriate insurance coverage throughout the term of the contract.

THIS FORM MUST ACCOMPANY BID PACKET

ATTACHMENT III

Project Requirements Acknowledgement

This is to certify that I, _____, possess all of the
APPLICABLE:

1. Licenses:

2. Bonds:

3. Certificates:

4. Permits:

5. Other:

necessary to carry out the required project. Furthermore, I am providing copies of the required documentation, so that if my company is awarded the bid, I may be eligible to enter a contract with the CITY and proceed to complete the project in a timely manner.

*** Any license, bonds, certificates, permits, etc. which are required must be presented as part of the bid packet in order to expedite the bid evaluation process. Failure to provide said documentation will result in the disqualification of your bid.**

Authorized Signature

Date

Company

Address

City, State, Zip

ATTACHMENT IV

LITIGATION DISCLOSURE FORM

Failure to fully and truthfully disclose the information required by this Litigation Disclosure form may result in the disqualification of your submittal from consideration or termination of the contract, once awarded.

1. Have you or any member of your Firm or Team to be assigned to this engagement ever been indicted or convicted of a felony or misdemeanor greater than a Class C in the last five (5) years?

Circle One

YES

NO

2. Have you or any member of your Firm or Team to be assigned to this engagement ever been terminated (for cause or otherwise) from any work being performed for the CITY or any other Federal, State or Local Government, or Private Entity?

Circle One

YES

NO

3. Have you or any member of your Firm or Team to be assigned to this engagement ever been involved in any claim or litigation with the CITY or any other Federal, State or Local Government, or Private Entity during the last ten (10) years?

Circle One

YES

NO

If you have answered "Yes" to any of the above questions, please indicate the name(s) of the person(s), the nature, and the status and/or outcome of the information, indictment, conviction, termination, claim or litigation, as applicable. Any such information should be provided on a separate page, attached to this form and submitted with your submittal.

ATTACHMENT V

**VENDOR/S PROVIDING PROPOSAL FOR REPLACEMENT OF LOS
VENADOS STANDPIPE QUALIFICATIONS
GENERAL QUESTIONNAIRE**

- 1 Name/Name of Agency/Company: _____

(Full, correct legal name)
- 2 Address: _____

3. Telephone/Fax: _____

4. Does your Company anticipate any mergers, transfer of organization ownership, management reorganization, or departure of key personnel within the next twelve (12) months that may affect the organization's ability to carry out its submittal?
- Yes____ No____
5. Is your Company authorized and/or licensed to do business in Texas?
Yes____ No____
6. Where is the Company's corporate headquarters located? _____

7. a. Does the Company have an office located in Edinburg, Texas?
- Yes____ No____
- b. If the answer to the previous question is "yes", how long has the Company conducted business from its Edinburg office?
- ____ (years) ____ (months)
- c. State the number of full-time employees at the Edinburg office. _____
8. a. If the Company does not have an Edinburg office, does the Company have an office located in Hidalgo County, Texas?
- Yes____ No____

b. If the answer to the previous question is yes, how long has the Company conducted business from its Hidalgo County office?

_____ (years) _____ (months)

c. State the number of full-time employees at the Hidalgo County office. _____

9. Has the Company or any of its principals been debarred or suspended from contracting with any public entity? Yes_____ No_____

If yes, identify the public entity and the name and current phone number of a representative of the public entity familiar with the debarment or suspension, and state the reason for or circumstances surrounding the debarment or suspension, including but not limited to the period of time for such debarment or suspension. _____

10. Indicate person whom The CITY may contact concerning your submittal or setting dates for meetings.

Name: _____

Address: _____

Telephone: _____

Fax: _____

Email: _____

11. Surety Information

Have you or the Company ever had a bond or surety instrument "called," canceled, or forfeited?

Yes () No ().

If yes, state the name of the bonding company, date, amount of bond and reason for such bond being "called," or its cancellation or forfeiture. _____

12. Bankruptcy Information

Have you or the Company ever been declared bankrupt or filed for protection from creditors under state or federal proceedings? Yes () No ()

If yes, state the date, court, jurisdiction, cause number, amount of liabilities and amount of assets. _____

13. Provide any other names under which your business has operated within the last 10 years.

ATTACHMENT VI
HOUSE BILL 89 VERIFICATION

I, _____, the undersigned representative
of _____,

_____, (Company or Business name)
(hereafter referred to as company) being an adult over the age of eighteen (18) years of age,
verify that the company named-above, under the provisions of Subtitle F, Title 10,
Government Code Chapter 2270:

1. Does not boycott Israel currently; and
2. Will not boycott Israel during the term of the contract.
- 3) Is not currently listed on the State of Texas Comptroller's Companies that Boycott
Israel _____ List _____ located _____ at
<https://comptroller.texas.gov/purchasing/publications/divestment.php>

Pursuant to Section 2270.001, Texas Government Code:

1. "Boycott Israel" means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes; and

2. "Company" means a for-profit sole proprietorship, organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or any limited liability company, including a wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of those entities or business associations that exist to make a profit.

SIGNATURE OF COMPANY REPRESENTATIVE:

TYPE/PRINT NAME AND TITLE:

DATE:

ATTACHMENT VII

SUBMITTAL CHECKLIST

This checklist is to help the company submitting proposal for REPLACEMENT OF LOS VENADOS STANDPIPE ensure that all required documents have been included in its submittal.

Document and Location in Submittal	Check or Initial to Indicate Document is Attached to Submittal
Tab A – Interest Statement	
Tab B – Company submitting proposal for the REPLACEMENT OF LOS VENADOS STANDPIPE Qualification General Questionnaire (Attachment VI in RFP)	
Tab C – *Project Requirements Acknowledgement (Attachment V in RFP)	
Tab D – Litigation Disclosure (Attachment IV in RFP)	
Tab E – Proof of Insurability (Letter from Insurance Provider and copy of current Insurance Certificate)	
Tab F – *Insurance Requirement Acknowledgement (Attachment II in RFP)	
Tab G – Letter of Intent from Surety Company to provide Payment and Performance Bonds. (Section II in RFP Requirements)	
Tab H – Submittal Checklist (Attachment VI in RFP)	
Tab I - *House Bill 89 Verification (Attachment VI)	
Tab J- *Formal Proposal for the REPLACEMENT OF LOS VENADOS STANDPIPE	
1 Original* and 4 Copies of Submittal	

***Documents marked with an asterisk on this checklist require a signature. Be sure they are signed prior to submittal.**

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Document 00020

NOTICE TO BIDDERS

Owner: City of Edinburg
415 W. University Drive
Edinburg, Texas 78539
Phone: (956) 388-8211
Fax: (956) 383-7111

Engineer: Hinojosa engineering, Inc.
108 W. 18th St.
Mission, TEXAS 78572
Phone: (956) 581-0143
Fax: (956) 581-2074

1.00 INVITATION

- A. Bidders are invited to submit an offer for performance of a Contract to the City of Edinburg located at the above address, for the following construction Project:
Project: Replacement of Los Venados Standpipe
Located: 2286 N. Highway 281 Edinburg, TX. 78542
- B. Work of the Project consists of Replacement of Existing Standpipe Structure & Pumps.
- C. The Contract Documents are identified Replacement of Los Venados Standpipe listed in the Project Manual, issued by the City of Edinburg/Hinojosa Engineering, Inc.
- D. The bidder shall bear all costs associated with the preparation and submission of its bid, and the Owner will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.
- E. When requested, the successful Bidder shall present satisfactory evidence that Bidder has regularly engaged in furnishing products and performing construction work as proposed, and has the capital, labor, equipment, and material to execute the Work required by Contract Documents.

2.00 BID SUBMISSION

- A. Bids signed by an officer of the company and dated will be received at the City Secretary's Office, at 415 W. University Drive, Edinburg, TX 78539 until (3:00 p.m.) local time, on August 19, 2019.
- B. Bids submitted after the above time will be returned to the Bidder unopened.
- C. Bids shall be submitted in United States Currency and the English language on the Bid Forms and Supplements to Bid Forms provided with this Project Manual.
- D. Oral, telephonic, facsimile, or telegraphic bids are invalid and will not receive consideration.
- E. Bids will be opened and publicly read in the City of Edinburg City Hall Community Room at 415 W. University Drive, Edinburg, TX 78539 on the same date bids are received.
- F. Bids will be irrevocable for 90 **days** from the bid date. Bidder may withdraw after 90 days without penalty if no mutual agreement can be reached.

3.00 MODIFICATION OR WITHDRAWAL

- A. Bids submitted early may be modified or withdrawn by notice to the City of Edinburg at the place and prior to the time designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder and shall be so worded as not to reveal the amount of the original Bid.
- B. Oral, telephonic, facsimile, or telegraphic modification of Bids will not receive consideration.
- C. Withdrawn Bids may be resubmitted up to the time designated for receipt of Bids.

4.00 CONTRACT TIME

- A. The Work shall be performed within the date established in the Notice to Proceed.
- B. Contractor shall pay liquidated damages in the amounts stated in Document 00500 - Agreement for failure to complete the Work within the Contract Time.
- C. The work is to be performed only during weekdays 8:00 AM to 5:00 PM (Monday to Friday). City recognized holidays are recommended to be avoided. Work performed during weekends (Saturday-Sunday) and holidays will incur a Contractor payment of **\$50** per hour to Owner for onsite inspection.

5.00 SECURITY DEPOSIT REQUIREMENTS

- A. Bids shall be accompanied by a security deposit as stated in Document 00100 - Instructions to Bidders.

6.00 EXAMINATION

- A. Bid Documents are on display on the City of Edinburg website, may be examined at the location below or purchased from the Engineer of Record:

**City of Edinburg
Engineering Department – 2nd Floor
415 W. University Drive
Edinburg, Texas 78539**

7.00 AVAILABILITY

- A. Bid Documents may be purchased from the Engineering Department, Engineer of Record or are available for printing at http://cityofedinburg.com/departments/finance/open_bid_notices.php.
- B. All official notifications, addenda, and other Bidding Documents will be offered only through the designated website. Neither Owner nor Engineer will be responsible for Bidding Documents, including addenda, if any, obtained from sources other than the designated website.
- C. Bid Documents may be purchased by bidders upon receipt of a cashier's check, certified check, money order, company check, or personal check in the amount established by the City of Edinburg or Engineer of Record. The cost includes the Project Manual w/ Specifications and one full sized set of Drawings. They can also be downloaded at no cost, as specified on 7(A).
- D. **The cost for the bid documents will not be refunded.**
- E. Bid Documents are made available only for the purpose of obtaining offers for this Project. Purchase of Bid Documents does not grant a license for other purposes.

On receipt of Bid Documents, verify that documents are legible and complete. Compare contents of Project Manual with Table of Contents; see that all drawings listed in the List of Drawings are included. Notify City of Edinburg should the documents be incomplete as issued.

8.00 QUESTIONS AND INTERPRETATIONS

- A. Bidder is required to study Bid Documents, the site, and conditions affecting the Work, and submit written questions on interpretation of those documents and conditions, or other factors affecting the Work, to the City of Edinburg.
- B. Written questions may be submitted by facsimile or email, addressed to the Engineer. **No questions will be accepted after 5:00 PM, August 14, 2019.** All facsimile communications shall be confirmed by mailing the original correspondence to the City of Edinburg Purchasing Department, if applicable.
- C. Immediately notify the Engineer upon finding discrepancies or omissions in the Bid Documents.

9.00 ACCEPTANCE/REJECTION OF BIDS

- A. The Owner reserves the right to reject or accept any bids as stated in Document 00100 - Instructions to Bidders.

10.00 PRE-BID CONFERENCE

- A. One (1) pre-bid conference will be conducted by the Owner on August 12, 2019 at 10:30 A.M. The pre-bid conference shall be conducted at the City of Edinburg Engineering Conference Room: located at 415 W. University Drive Edinburg, Texas 78539.
- B. **Attendance by prospective Bidders is highly recommended.** Sub-contractors, suppliers, and equipment suppliers may attend.
- C. Recognizing that free and open communication will benefit all participants, the Owner does not intend to limit or curtail the exchange of information between the Engineer and the prospective Bidders. However, the pre-bid conference is conducted primarily for the benefit of prospective Bidders. As such, a specific procedure will be followed during the conference:
 - a. All attendees will sign-in, indicating their role with the project: contractor, supplier, manufacturer, etc.
 - b. Seating priority will be given to Prospective Bidders. Sub-contractors, suppliers, and manufacturer's representatives shall remain behind the contractor area.
 - c. The Owner will make introductions of his staff and consultants.
 - d. The Owner and consultants will give a brief description of the project.
 - e. Only Contracting firms (Prospective Bidders) are permitted to ask questions. Sub-contractors suppliers, and manufacturer's shall deliver their questions to the Contractor they are working with for presentation.
 - f. Questions and answers will be recorded and developed into Meeting Minutes. Meeting Minutes will be distributed to meeting attendees. The Owner reserves the right to use electronic recording, or some other method to record the meeting.
- D. The meeting will be conducted in English. Translators will not be provided.
- E. If necessary, written clarifications or instructions will be issued in the form of an Addendum. Refer to Section 00100 – Instructions to Bidders for specific information concerning Addendums.

END OF DOCUMENT

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Document 00100

INSTRUCTIONS TO BIDDERS**1.00 SUMMARY****1.01 DOCUMENT INCLUDES**

- A. Bid Documents and Contract Documents.
- B. Site Assessment.
- C. Subcontractors/Suppliers/Others.
- D. Bid Submission.
- E. Bid Enclosure Requirements.
- F. Offer, Acceptance, Rejection.

1.02 RELATED DOCUMENTS

- A. Document 00020 - Notice to Bidders: Date, time and place for receipt of bids; Contract Time.
- B. Document 00310 - Form of Proposal.
- C. Document 00405 - Schedule of Unit Price Work.
- D. Document 00450 - Post Bid Procedures.
- E. Document 00500 - Agreement.
- F. Document 00700 - General Conditions.
- G. Document 00800 - Supplementary Conditions.

2.00 BID DOCUMENTS AND CONTRACT DOCUMENTS**2.01 DEFINITIONS**

- A. Definitions set forth in Document 00700 – General Conditions and in other Contract Documents, are applicable to the Bid Documents.
- B. Addenda: Written or graphic instruments issued prior to the opening of Bids, which clarify, modify, correct, or change the Bid Documents.
- C. Alternate Bid: The total amount bid for additions to the Work, as described in the Bid Documents. Each Alternate Bid shall include the cost of effects on adjacent or related components, and the Contractor's overhead and profit.
- D. Bid Documents: The Project Manual and Drawings, including Addenda, plus Notice to Bidders, Instructions to Bidders, and Supplements to Bid Forms identified in Document 00310 - Form of Proposal.
- E. Bidder: A person or entity who submits a Bid.
- F. Low Bidder: The apparent successful Bidder who qualifies as a responsible Bidder and who submits the Bid with the lowest Total Bid Price.

00100- 1 of 10

- G. Bid, Offer, Bidding: The act of submitting a complete and properly signed offer in accordance with these Instructions to Bidders. The Bid will be in the English language.
- H. Total Bid Price: The monetary amount for performing the Work as identified by the Bidder in Document 00310 - Form of Proposal, which amount includes Cash Allowances and Alternate Bids, if any. Bid Price(s) will be in United States.
- I. Security Deposit: A certified check, cashiers check or bid bond in at least the sum of 5 percent of the Total Bid Price which includes Cash Allowances and Alternate Bids, if any.

2.02 QUESTIONS, INTERPRETATIONS

- A. Bidder shall: 1) carefully study the Bid Documents and compare them with each other, 2) examine the site, conditions thereon, and local conditions, and 3) report at once to the Engineer any errors, inconsistencies or ambiguities discovered.
- B. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.
- C. Direct questions to Engineer.
- D. Verbal discussions and answers are not binding. Requests from Bidders for clarifications and interpretations of content of documents must be in writing (mail or facsimile transmission only), and must be received not less than 5 business days before the date set for receipt of Bids.
- E. The reply will be by Addendum.

2.03 ADDENDA

- A. Addenda issued to Bidding Requirements are applicable only during the bidding period. Addenda to the Post-Bid Procedures are applicable only through the issuance of the Notice to Proceed. Any Addenda issued to Contract Forms, Conditions of the Contract, Specifications or Drawings become a part of the Contract Documents. Include resultant costs in the Total Bid Price.
- B. Addenda will be issued by the Engineer to Bidders of record by email. Addenda will also be posted on the City website.
- C. Each Bidder shall ascertain, prior to submitting a Bid that the Bidder has received all Addenda issued. The Bidder shall acknowledge their receipt in the place indicated in Document 00310 - Form of Proposal.

2.04 SUBSTITUTIONS OF MATERIALS/EQUIPMENT

- A. No substitutions will be considered on this Project during the bidding period.
- B. Voluntary substitutions by the Bidder will not be considered.

3.00 SITE ASSESSMENT

- A. Bidders shall examine the Project site before submitting a Bid, become familiar with local conditions under which the Work will be performed, conduct appropriate explorations, and correlate personal observations with requirements of the Bid Documents. Work will be

performed in public right-of-way and City property. The site may be examined at any time during daylight hours.

- B. Bidder shall make site investigations to the extent Bidder deems necessary to ascertain the extent of subsurface conditions and variations thereof.
- C. Failure to perform such investigations during the bid period shall not relieve Bidder from responsibility for investigations, interpretations and proper use of available information in preparation of Bidder's proposal.
- D. Publications by the United States Department of Agriculture, Soil Conservation Service and others may be helpful to the bidder in his subsurface site investigation.
- E. Geotechnical investigation reports for the proposed project site may also be helpful to the bidder in his subsurface site investigation.

4.00 SUBCONTRACTORS/SUPPLIERS/OTHERS

- A. The Owner reserves the right to reject a proposed Subcontractor or Supplier for reasonable cause.

5.00 BID SUBMISSION

5.01 SUBMISSION PROCEDURES

- A. Bidders shall be solely responsible for the delivery of their Bids in the manner and time prescribed in Document 00020 - Notice to Bidders.
- B. Submit **one copy of the original executed offer** on the bid forms provided, properly signed, with required Security Deposit, and other Supplements to Bid Forms, in a sealed, opaque envelope. On the outside of the envelope, clearly indicate that it is a sealed bid and include the Bidder's name, Project name and Owner name. Bids submitted by mail shall be enclosed in a separate envelope addressed for mailing, and identifying the enclosure as a bid. In addition, **four copies must also be submitted.**
- C. Fill in all blanks in the Bid forms. Acknowledge receipt of Addenda. Bid all Alternate Bids required by Bid Documents.
- D. A summary of submitted Bids will be made available to Bidders following the Bid opening.
- E. All costs and expenses incurred by the Bidder that are associated with preparation of the Bid shall be paid by and be the sole responsibility of the Bidder.

5.02 BID INELIGIBILITY

- A. Failure to provide required Security Deposit in the proper amount will be cause to declare the Bid invalid.
- B. Improperly completed information may be cause for declaring the Bid invalid.
- C. Bids that are unsigned, improperly signed, illegible, obscure, altered, or which contain qualifications or irregularities of any kind, may be declared invalid. Document 00310 - Form of Proposal, Supplements to the Bid Forms identified in the Form of Proposal, or enclosures which are improperly prepared, may be declared invalid.

6.00 BID ENCLOSURE REQUIREMENTS**6.01 SUPPLEMENTS TO BID FORMS**

- A. Bid submittals shall include any other documents specified in Document 00310 - Form of Proposal.

6.02 SECURITY DEPOSIT

- A. Bids shall be accompanied by a Security Deposit.
- B. The Security Deposit of the Bidders will be retained until after the Contract is executed.
- C. After execution of the Contract, Security Deposits will be returned to the Bidders.
- D. If no Contract is awarded, all Security Deposits will be returned to the respective Bidders.

6.03 CERTIFIED CHECK/CASHIER'S CHECK

- A. Make certified check or cashier's check (security checks) payable to the Owner.
- B. The security checks are submitted on the condition that if the Bidder is named apparent Low Bidder and then fails either to timely execute the Agreement or to timely provide any required bonds, or to do both, then in that event the Owner will cash the security check.
- C. The Owner will retain an amount equal to the difference between the Bid of the Bidder providing the security check and the Bid of the Bidder who is finally awarded the Contract and who executes the Agreement and provides the required bonds.
- D. Any balance remaining will be reimbursed by the Owner to the Bidder who provided the security check.

6.04 BID BOND

- A. The bid bond must be a valid and enforceable bond, executed by a corporate Surety authorized by the Texas State Board of Insurance to conduct insurance business in the State of Texas and shall comply with other requirements set out by law or included in the Bid Documents.
- B. Endorse the bid bond in the name of the Owner as obligee, signed by the Contractor as principal and executed, signed and sealed by the Surety.
- C. The bid bond must be conditioned such that if the Bidder is named apparent Low Bidder and then fails either to execute the Agreement timely or to provide any required bonds timely, or to do both, then in that event the Surety will be obligated to pay to the Owner an amount equal to the difference between the Bid of the Bidder on whom the bond was written and the Bid of the Bidder who is finally awarded the Contract and who executes the Agreement and provides the required bonds, up to the penal sum of the Bond.
- D. In addition, the Owner expressly reserves the right to reject any Bid if the Bid Bond (or Bid Bond rider) conditions the Bid in a way inconsistent with the Bid Documents. Examples include but are not limited to:
 - 1. a condition prohibiting the Owner from making a Claim against the Performance Bond Surety that would be allowable under the Contract and Performance Bond form published in the Bid Documents;

2. a condition that provides that the Performance Bond Surety cannot be held liable for completing the Contract in case of default; or
 3. a condition limiting the Performance Bond Surety's liability for damages inconsistent with the Contract and Performance Bond form published in the Bid Documents.
- E. On all contracts that will equal to or exceed \$100,000, the performance bond and the payment bond must be provided by a surety that has a rating of "A" from AM BEST, MOODY'S or STANDARD & POORS.

In the event that the total bid amount is \$50,000 or less, the successful contractor has the option to enter into a single payment contract with the City of Edinburg in lieu of a Performance Bond, provided that no money shall be paid to the contractor until completion of the work by the contractor and accepted of same by the City of Edinburg. In the event that the total bid amount is \$25,000 or less, the successful contractor has the option to enter into a single payment contract with the City of Edinburg in lieu of a Payment and Performance Bond.

6.05 BID FORM SIGNATURE

- A. Document 00310 - Form of Proposal shall be signed by the Bidder as follows:
1. Sole Proprietorship: Full name, address, and signature of sole proprietor, signed in the presence of a witness who will also sign. Insert the words "Sole Proprietor" under the signature.
 2. Partnership: Name and address of the firm, signature of each partner in the presence of a witness who will also sign. The full name and address of each partner shall be given.
 3. Corporation: Signature of duly authorized officer.
 4. Joint Venture: Each party of the joint venture shall execute Document 00310 - Form of Proposal under their respective seals in a manner appropriate to such party as described above, similar to the requirements of a Partnership.

7.00 DETERMINING LOWEST RESPONSIVE, RESPONSIBLE BIDDER

7.01 BIDDERS QUALIFICATIONS

- A. Bids must contain evidence of Bidder's qualifications to do business in the state of Texas. To demonstrate that the Bidder is responsible and able to perform the Work, funding policies dictate each Bidder must submit, as a part of the Bidding Documents, all of the items listed below:

00310 Form of Proposal
00405 Schedule of Unit Price Work
00411 Bid Bond
00420 Statement of Bidder's Qualifications
00423 Certification of Bidder's Qualifications
00425 Equipment & Material Suppliers List
00460 Non-Collusion Affidavit
00429 Non-Bribery Model Form

00100- 5 of 10

- B. Only the above data/information provided with the Bidding Documents may be used for evaluation and developing the Recommendation to Award by the Engineer. Bidders will not be allowed to substitute any "Key Personnel" other than alternates presented in the bid or examples of previous projects submitted in the bid package. Minor clarifications of submitted materials will be permitted after bid opening. Such request for clarifications will only be initiated by the Engineer in writing and only written responses will be accepted.
- C. In determining the lowest responsible, responsive Bidder, in addition to price, the following elements will be considered:
1. The quality, availability, and adaptability of the supplies, materials, equipment, or contractual services, to the particular use required;
 2. The ability, capacity and skill of the bidder to perform the contract or to provide the service required;
 3. Whether the bidder can perform the contract and provide the service promptly, or within the time required, without delay or interference;
 4. The character, responsibility, integrity, reputation, and experience of the bidder;
 5. The quality of performance of previous services, or contracts;
 6. The previous and existing compliance by the bidder with laws relating to the contract or service;
 7. Any previous or existing noncompliance by the bidder with specifications, or requirements relating to time of submission of specified data such as samples, models, drawings, certificates, or other information;
 8. The sufficiency of the financial resources and ability of the bidder to perform the contract or to provide the service; and
 9. The ability of the bidder to provide competent personnel for the job, as demonstrated by the submitted listing of the names and the skills of experienced personnel, including potential alternates, whom the bidder currently employs and who will be available for performing this work;
 10. The experience of the bidder in performing work similar in type, size and complexity to this project, as demonstrated by a listing of projects, with verifiable references (names, addresses, phone numbers, etc.), successfully completed.
 11. Bidder shall provide with the Bid an experience statement with pertinent information regarding similar projects and other evidence of qualifications for each such Subcontractor, Supplier, person, or organization.

7.02 BIDDER MUST MEET THE FOLLOWING MINIMUM CRITERIA:

- (A) The Bidder must demonstrate **Successful Completion during the last five (5) years of at least one project comparable in nature and scope to this project. The comparable scope shall be at least 1/4 the size of the proposed project.
- (B) At least two *Key Personnel, and their potential alternate, employed by the Bidder must have a minimum of five (5) years experience in similar construction projects.

- (C) The Bidder must have an employee, to be dedicated to this project, who is experienced in scheduling, with demonstrated ability in employing scheduling techniques similar to those to be used for this project.
- (D) Bidder may, at its discretion, include resumes of alternates for Key Personnel, and if in the process of bid evaluation, the Owner rejects any Key Personnel, the Owner will consider the alternates.

* **KEY PERSONNEL:** Individuals who will be directly assigned to this project. Resumes of Key Personnel must be submitted with the Bid (include in Document 00420) and accepted by the Owner in order for Bidder to receive the Award. At the minimum, the resumes for the following personnel that are to be assigned to this Project are to be submitted.

- (a) Owner or Principals of the Bidder
- (b) The Project Manager
- (c) The Project Superintendent
- (d) The Project Scheduler
- (e) Minimum of two Foremen

****SUCCESSFUL COMPLETION:** Defined as completion of a project on time, no more than thirty (30) days later than the original contract time, and within budget, within 5% of the original contract price. If there is any project submitted by the Bidder as qualifying, but which does not meet these requirements, in order to be fully responsible, the Bidder is required to submit detailed information on that project demonstrating what caused the increases to cost or time. The name and telephone numbers of the Design Engineer and the Client are to be provided for evaluation as to whether the project may be considered "successful". For any project where liquidated damages were assessed, the Bidder will not be considered to have been on time.

7.03 BIDDERS ARE REQUIRED TO SUBMIT WITH THEIR BID:

00310 Form of Proposal

00405 Schedule of Unit Price Work

00411 Bid Bond

00420 Statement of Bidder's Qualifications

00423 Certification of Bidder's Qualifications

00425 Equipment & Material Suppliers List

00429 Non-Bribery Model Form

00460 Non-Collusion Affidavit

- (A) Failure to submit these items with the bid will result in a finding that the bid is non-responsive and the bid will be disqualified.

7.04 The Owner will evaluate and compare only the bids determined to be responsive in accordance with the following:

- (a) Is the bid complete (all Bidding Documents submitted);
- (b) Have documents been properly signed;
- (c) Are the required bid securities part of the bid package; and

(d) Are there any computational errors present?

7.05 The Owner reserves the right to accept or reject any variation, deviation, or alternative offer which is not submitted in accordance with the bidding documents. Variations, deviations, alternative offers, and other factors that are in excess of the requirements of the bidding documents or which otherwise result in unsolicited benefits for the Owner, shall not be taken into account in bid evaluation.

7.06 In evaluating the bids, the Owner will determine for each bid, the evaluated bid price by adjusting the bid price as follows:

- A. Making any correction for errors;
- B. Excluding provisional sums and the provision, if any, for contingencies in the price schedules;
- C. Taking an appropriate adjustment for any other quantifiable acceptable non-material variations, deviations or alternative offers; and
- D. Making appropriate adjustments to reflect additional factors in the manner and to the extent indicated in the Bidding Documents.

7.07 The Owner will award the contract to the bidder whose bid has been determined to be substantially responsive to the bidding documents and who has offered the lowest evaluated bid price provided that such bidder has been determined to be qualified to perform the contract satisfactorily in accordance with the provisions of the Bidding Documents.

8.00 OFFER ACCEPTANCE, REJECTION

8.01 ACCEPTANCE

- A. The Owner will give notice of intent to award the Contract to the Low Bidder. Acceptance by the Owner is conditioned upon Bidder's submission of information for establishing satisfactory qualifications, if required; and execution of submittals required in Document 00450 - Post-Bid Procedures.
- B. The Bid shall remain open to acceptance and shall be irrevocable for the Period for Bid Acceptance stated in Document 00020 – Notice to Bidders.
- C. Additional time taken by Contractor to fulfill requirements for submittals, including review and re-submittal, shall be added to the acceptance period.

8.02 REJECTION

- A. The Owner reserves the right to reject any and all Bids or to accept any Bid deemed advantageous to it.

8.03 BID TABULATION

- A. The Engineer will tabulate, record, and evaluate the Bids of all responsible Bidders after the Bid opening.
- B. In tabulating Bids, the amount written for a unit price governs over the total amount calculated. Therefore, the Engineer may correct any mathematical errors in the extension of the total amount based on the unit price given by a Bidder and adjust their Total Bid Price.

9.00 APPROVAL BY THE FUNDING AGENCIES

- A. All addenda, contracts, work directives, change orders, time extensions, and other matters specified in the Contract Documents are not valid until approved in accordance with the City of Edinburg's Purchasing Policies and Procedures Manual.

END OF DOCUMENT

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Document 00300

CONTRACTOR NOTICE OF INTENT TO RESPOND

Firms interested in submitting a bid on the project as outlined in the specifications, should indicate their intention by signing, dating and returning the form to the address below prior to August 14, 2019, so that they may receive any addendums to the specifications should the need arise.

Owner: City of Edinburg
Attn: Finance Department
415 W. University Drive
Edinburg, Texas 78539

Engineer: Hinojosa Engineering, Inc.
Attn: Ricardo Hinojosa, P.E.
108 W. 18th St.
Mission, Texas 78572

Bidder: _____
[Please print or type the full name of your proprietorship, partnership, corporation, or joint venture.*)

Contact Name: _____
[Please print or type name] [Title]

Address: _____
[Mailing]

[Street, if different]

Telephone: _____
[Print or type telephone number]

Fax: _____
[Print or type telephone number]

Email: _____
[Print or type telephone number]

END OF DOCUMENT

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Document 00310

FORM OF PROPOSALTo: CITY OF EDINBURG

Project No.: 2019-82

Project: Replacement of Los Venados Standpipe

Bidder: _____

[Print or type full name of proprietorship, partnership, corporation, or joint venture]

1.0 OFFER

Having examined the place of the Work and all matters referred to in the Bid Documents, and the Contract Documents prepared by or approved by the Engineer for the named Project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Total Bid Price of:

_____(Dollars)
[Print or type in words, Bidder's Total Bid Price]

(\$ _____)
[Print or type in figures, Bidder's Total Bid Price]

Unit Price or Combination Stipulated Price and Unit Price Contract. If the Bid is for a Unit Price Contract or a combination of Stipulated Price and Unit Price Contract, the Total Bid Price, including Cash Allowances, if any, is tabulated in: Document 00405 - Schedule of Unit Price Work for a Project with no Alternate Bids, or Document 00407 - Schedule of Alternates for a Project with Alternate Bids.

Cash Allowances. All Cash Allowances, totaled in either Document 00405 - Schedule of Unit Price Work, as applicable, and described in the Bid Documents are included in the Total Bid Price.

Changes in Contract Price Due to Variations in Actual Quantities. For items quoted in Document 00405 - Schedule of Unit Price Work, the Total Bid Price is based in whole or in part on the Unit Price multiplied by the quantity for each of the items listed. The Contract Price is subject to change due to variation in the actual quantities of each item in the completed Work in accordance with the Contract Documents.

Alternate Bids. Alternate Bid work, as described in the Bid Documents, will be performed for an amount added or deducted to the Total Bid Price for each Alternate Bid that is accepted by the Owner. The Owner may accept or reject any or all Alternate Bids.

Security Deposit. Included herewith is a Security Deposit in the amount of 5 percent of the greatest amount of the Total Bid Price, or Total Alternate Bid Price(s).

Period for Bid Acceptance. This offer shall be open to acceptance and is irrevocable for 90 days from the Bid date. That period may be extended by mutual written agreement of the Owner and the Bidder. After 90 days, the Bidder may withdraw without penalty if no mutual agreement can be reached.

2.0 CONTRACT TIME

If this offer is accepted, Substantial Completion of the Work will be achieved within the time stated in Document 00020 - Notice to Bidders. The Date of Commencement will be established by the Notice to Proceed.

3.0 ADDENDA

The following Addenda have been received. The modifications to the Bid Documents noted therein have been considered and all costs relating thereto are included in the Bid Price:

Addendum No. _____, dated _____

Addendum No. _____, dated _____

Addendum No. _____, dated _____

Addendum No. _____, dated _____

Addendum No. _____, dated _____

Addendum No. _____, dated _____

4.0 SUPPLEMENTS TO THIS BID:

The following Supplements are attached as an integral part of this Bid:

- [] Document 00405 - Schedule of Unit Price Work, if applicable
- [] Document 00411 – Bid Bond (*Form supplied by Bidder*)
- [] Document 00420 – Statement of Bidder's Qualifications
- [] Document 00423 – Certification to Bidder's Experience & Qualifications
- [] Document 00425 – Equipment & Material Suppliers List

5.0 SIGNATURES:

Bidder: _____
[Please print or type the full name of your proprietorship, partnership, corporation, or joint venture.*)

By: _____
[Signature]** [Date]

Name: _____
[Please print or type name] [Title]

Address: _____
[Mailing]

[Street, if different]

Telephone: _____
[Print or type telephone number]

* *If the Bid is a joint venture, add additional Bid form signature sheets for each member of the joint venture.*

** *The undersigned, as bidder, certifies that the only person or parties interested in this proposal as principals are those named herein; that the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with the Contract for the Project.*

Note: This document constitutes a government record, as defined by § 37.01 of the Texas Penal Code. Submission of a false government record is punishable as provided in § 37.10 of the Texas Penal Code.

END OF DOCUMENT

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Document 00405

SCHEDULE OF UNIT PRICE WORK

This Document, constitutes a Supplement to Document 00310 - Form of Proposal.

When a Contract is awarded, this Document becomes a supplement to Document 00500 - Form of Agreement Between Owner and Contractor.

Base Bid					
CIVIL SITE SPEC NO.	DEMOLITION WORK DESCRIPTION	QTY	UNIT	UNIT PRICE (in figures)	UNIT TOTAL (in figures)
02220	Remove and discard existing water storage tank and its components in its entirety	1	LS	\$	\$
	Remove and discard existing water storage tank foundation and its components in its entirety	1	LS		
02 41 19	Remove and discard existing concrete spillway in its entirety	90	SF	\$	\$
	Remove and discard existing pipe and valve support concrete pedestals and base	72	SF	\$	\$
	Remove and discard existing concrete slab foundation in its entirety	480	SF	\$	\$
	Install new steel storage tank foundation and accessories	1	LS	\$	\$
	Install new steel storage tank and accessories	1	LS	\$	\$
				\$	\$
				\$	\$
				\$	\$
				\$	\$
				\$	\$
				\$	\$
				\$	\$
				\$	\$
				\$	\$
				\$	\$
Total					\$
In case of DISCREPANCIES, Unit Price RULES OVER Unit Total and Total Amounts.					

TOTAL BID PRICE (Total Unit Prices)

\$ _____

Notes:

(1) United States Dollars. In the event of a discrepancy, this column shall govern.

Project: _____

Project No. _____ Bidder's Signature: _____

Company: _____ Name: _____

Date: _____ Title: _____

END OF DOCUMENT

Document 00411

BID BOND**PART 1 - GENERAL****1.01 SECTION INCLUDES**

This section describes the standardized bid bond form to be submitted with the bid on the project.

1.02 REFERENCES – Not Used**1.03 DEFINITIONS – Section 0700****1.04 BID BOND FORMS**

Bidder is to inset an original bid bond or a copy of cashiers check provided for bid bond Purposes. Original check is to be submitted along with bid.

PART 2 - PRODUCT – Not Used**PART 3 - EXECUTION**

STANDARIZED FORMS FOLLOW

BID BOND (PENAL SUM FORM)

Bidder Name: [Full formal name of Bidder] Address <i>(principal place of business)</i> : [Address of Bidder's principal place of business]	Surety Name: [Full formal name of Surety] Address <i>(principal place of business)</i> : [Address of Surety's principal place of business]
Owner Name: [Full formal name of Owner] Address <i>(principal place of business)</i> : [Address of Owner's principal place of business]	Bid Project <i>(name and location)</i> : [Owner project/contract name, and location of the project] Bid Due Date: [Enter date bid is due]
Bond Penal Sum: [Amount] Date of Bond: [Date]	
Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.	
Bidder	Surety
<i>(Full formal name of Bidder)</i>	<i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature) (Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
<i>Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.</i>	

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder occurs 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 will 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 of 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 does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action will 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 the Bid due date.
7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder must 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 Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will 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 will 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 governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.

11. The term “Bid” as used herein includes a Bid, offer, or proposal as applicable.

END OF SECTION

DOCUMENT 00420

STATEMENT OF BIDDER'S QUALIFICATIONS**ARTICLE 1—GENERAL INFORMATION****1.01 Provide contact information for the Business:**

Legal Name of Business:			
Corporate Office			
Name:		Phone number:	
Title:		Email address:	
Business address of corporate office:			
Local Office			
Name:		Phone number:	
Title:		Email address:	
Business address of local office:			

1.02 Provide information on the Business's organizational structure:

Form of Business:	<input type="checkbox"/> Sole Proprietorship <input type="checkbox"/> Partnership <input type="checkbox"/> Corporation		
<input type="checkbox"/> Limited Liability Company <input type="checkbox"/> Joint Venture comprised of the following companies:			
1.			
2.			
3.			
Provide a separate Qualification Statement for each Joint Venturer.			
Date Business was formed:		State in which Business was formed:	
Is this Business authorized to operate in the Project location?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Pending	

- 1.03 Identify all businesses that own Business in whole or in part (25% or greater), or that are wholly or partly (25% or greater) owned by Business:

Name of business:		Affiliation:	
Address:			
Name of business:		Affiliation:	
Address:			
Name of business:		Affiliation:	
Address:			

- 1.04 Provide information regarding the Business's officers, partners, and limits of authority.

Name:		Title:	
Authorized to sign contracts: <input type="checkbox"/> Yes <input type="checkbox"/> No		Limit of Authority:	\$
Name:		Title:	
Authorized to sign contracts: <input type="checkbox"/> Yes <input type="checkbox"/> No		Limit of Authority:	\$
Name:		Title:	
Authorized to sign contracts: <input type="checkbox"/> Yes <input type="checkbox"/> No		Limit of Authority:	\$
Name:		Title:	

ARTICLE 2—LICENSING

- 2.01 Provide information regarding licensure for Business, if applicable:

Name of License:			
Licensing Agency:			
License No:		Expiration Date:	
Name of License:			
Licensing Agency:			
License No:		Expiration Date:	

ARTICLE 3—DIVERSE BUSINESS CERTIFICATIONS

- 3.01 Provide information regarding Business's Diverse Business Certification, if any. Provide evidence of current certification.

Certification	Certifying Agency	Certification Date
<input type="checkbox"/> Disadvantaged Business Enterprise		
<input type="checkbox"/> Minority Business Enterprise		
<input type="checkbox"/> Woman-Owned Business Enterprise		
<input type="checkbox"/> Small Business Enterprise		
<input type="checkbox"/> Disabled Business Enterprise		
<input type="checkbox"/> Veteran-Owned Business Enterprise		
<input type="checkbox"/> Service-Disabled Veteran-Owned Business		
<input type="checkbox"/> HUBZone Business (Historically Underutilized) Business		
<input type="checkbox"/> Other		
<input type="checkbox"/> None		

ARTICLE 4—SAFETY

- 4.01 Provide information regarding Business's safety organization and safety performance.

Name of Business's Safety Officer:		
Safety Certifications		
Certification Name	Issuing Agency	Expiration

- 4.02 Provide Worker's Compensation Insurance Experience Modification Rate (EMR), Total Recordable Frequency Rate (TRFR) for incidents, and Total Number of Recorded Manhours (MH) for the last 3 years and the EMR, TRFR, and MH history for the last 3 years of any proposed Subcontractor(s) that will provide Work valued at 10% or more of the Contract Price. Provide documentation of the EMR history for Business and Subcontractor(s).

Year									
Company	EMR	TRFR	MH	EMR	TRFR	MH	EMR	TRFR	MH

ARTICLE 5—FINANCIAL

- 5.01 Provide information regarding the Business's financial stability. Provide the most recent audited financial statement, and if such audited financial statement is not current, also provide the most current financial statement.

Financial Institution:			
Business address:			
Date of Business's most recent financial statement:		<input type="checkbox"/> Attached	
Date of Business's most recent audited financial statement:		<input type="checkbox"/> Attached	
Financial indicators from the most recent financial statement			
Contractor's Current Ratio (Current Assets ÷ Current Liabilities)			
Contractor's Quick Ratio ((Cash and Cash Equivalents + Accounts Receivable + Short Term Investments) ÷ Current Liabilities)			

ARTICLE 6—SURETY INFORMATION

- 6.01 Provide information regarding the surety company that will issue required bonds on behalf of the Business, including but not limited to performance and payment bonds.

Surety Name:			
Surety is a corporation organized and existing under the laws of the state of:			
Is surety authorized to provide surety bonds in the Project location?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Is surety listed in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" published in Department Circular 570 (as amended) by the Bureau of the Fiscal Service, U.S. Department of the Treasury? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Mailing Address (principal place of business):			
Physical Address (principal place of business):			
Phone (main):		Phone (claims):	

ARTICLE 7—INSURANCE

- 7.01 Provide information regarding Business's insurance company(s), including but not limited to its Commercial General Liability carrier. Provide information for each provider.

Name of insurance provider, and type of policy (CLE, auto, etc.):			
Insurance Provider		Type of Policy (Coverage Provided)	
Are providers licensed or authorized to issue policies in the Project location?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Does provider have an A.M. Best Rating of A-VII or better?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mailing Address (principal place of business):			
Physical Address (principal place of business):			
Phone (main):		Phone (claims):	

ARTICLE 8—CONSTRUCTION EXPERIENCE

- 8.01 Provide information that will identify the overall size and capacity of the Business.

Average number of current full-time employees:	
Estimate of revenue for the current year:	
Estimate of revenue for the previous year:	

- 8.02 Provide information regarding the Business's previous contracting experience.

Years of experience with projects like the proposed project:			
As a general contractor:		As a joint venturer:	
Has Business, or a predecessor in interest, or an affiliate identified in Paragraph 1.03:			
Been disqualified as a bidder by any local, state, or federal agency within the last 5 years? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Been barred from contracting by any local, state, or federal agency within the last 5 years? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Been released from a bid in the past 5 years? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Defaulted on a project or failed to complete any contract awarded to it? <input type="checkbox"/> Yes <input type="checkbox"/> No			

Refused to construct or refused to provide materials defined in the contract documents or in a change order? <input type="checkbox"/> Yes <input type="checkbox"/> No
Been a party to any currently pending litigation or arbitration? <input type="checkbox"/> Yes <input type="checkbox"/> No
Provide full details in a separate attachment if the response to any of these questions is Yes.

- 8.03 List all projects currently under contract in Schedule A and provide indicated information.
- 8.04 List a minimum of three and a maximum of six projects completed in the last 5 years in Schedule B and provide indicated information to demonstrate the Business's experience with projects similar in type and cost of construction.
- 8.05 In Schedule C, provide information on key individuals whom Business intends to assign to the Project. Provide resumes for those individuals included in Schedule C. Key individuals include the Project Manager, Project Superintendent, Quality Manager, and Safety Manager. Resumes may be provided for Business's key leaders as well.

ARTICLE 9—REQUIRED ATTACHMENTS

- 9.01 Provide the following information with the Statement of Qualifications:
- A. If Business is a Joint Venture, separate Qualifications Statements for each Joint Venturer, as required in Paragraph 1.02.
 - B. Diverse Business Certifications if required by Paragraph 3.01.
 - C. Certification of Business's safety performance if required by Paragraph 4.02.
 - D. Financial statements as required by Paragraph 5.01.
 - E. Attachments providing additional information as required by Paragraph 8.02.
 - F. Schedule A (Current Projects) as required by Paragraph 8.03.
 - G. Schedule B (Previous Experience with Similar Projects) as required by Paragraph 8.04.
 - H. Schedule C (Key Individuals) and resumes for the key individuals listed, as required by Paragraph 8.05.
 - I. Additional items as pertinent.

This Statement of Qualifications is offered by:

Business:

(typed or printed name of organization)

By:

(individual's signature)

Name:

(typed or printed)

Title:

(typed or printed)

Date:

(date signed)

(If Business is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:

(individual's signature)

Name:

(typed or printed)

Title:

(typed or printed)

Address for giving notices:

Designated Representative:

Name:

(typed or printed)

Title:

(typed or printed)

Address:

Phone:

Email:

Schedule A—Current Projects

Name of Organization					
Project Owner		Project Name			
General Description of Project					
Project Cost		Date Project			
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name			
General Description of Project					
Project Cost		Date Project			
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name			
General Description of Project					
Project Cost		Date Project			
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					

Construction Manager					
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Schedule B—Previous Experience with Similar Projects

Name of Organization					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email

Owner					
Designer					
Construction Manager					

Schedule B—Previous Experience with Similar Projects

Name of Organization					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					

Construction Manager					
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Schedule C—Key Individuals

Project Manager			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	
Project Superintendent			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

Safety Manager			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	
Quality Control Manager			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	

Candidate's role on project		Candidate's role on project	
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END OF DOCUMENT

DOCUMENT 00423

**CERTIFICATE OF BIDDER'S
EXPERIENCE & QUALIFICATIONS**

The undersigned bidder certifies that he is, at the time of bidding, and shall be, throughout the period of the contract, licensed by the State of Texas to do the type of work required under terms of the contract documents. Bidder further certifies that he is skilled and regularly engaged in the general class and type of work called for in the contract documents.

The bidder represents that he is competent, knowledgeable and has special skills on the nature, extent and inherent conditions of the work to be performed. Bidder further acknowledges that there are certain peculiar and inherent conditions existent in the construction of the particular facilities which may create, during the construction program, unusual or peculiar unsafe conditions hazardous to persons and property. Bidder expressly acknowledges that he is aware of such peculiar risks and that he has the skill and experience to foresee and to adopt protective measures to adequately and safely perform the construction work with respect to such hazards.

Signed this ____ day of _____, 20____.

Name of Bidder

Signature of Bidder

Title of Signatory**END OF SECTION**

00423 - 1 of 2

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DOCUMENT 00425

EQUIPMENT & MATERIAL SUPPLIERS LIST

PURPOSE: To assist the Owner in determining the ability of each Bidder to properly fulfill the requirements of this proposed contract, the Bidder shall complete the following items. All questions must be answered and the data given must be clear and comprehensive. If necessary, questions may be answered on separate attached sheets as specified by 00420 Statement of Bidder's Qualifications. If, in the course of evaluating the bids, the Owner discovers that answers to these questions are false or misleading then the Owner reserves the right to reject the bid based on non-responsiveness. **This statement must be notarized.**

The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the Owner in verification of the recitals comprising this Statement of Bidder's Qualifications.

A. EQUIPMENT AVAILABLE FOR THIS CONTRACT: The Bidder shall provide below a list of equipment available for use on this contract:

EQUIPMENT	OWN	RENT/LEASE (Supplier & Phone #)

B. MATERIALS AND MAJOR EQUIPMENT: The Bidder shall provide below a list of manufacturers and suppliers of major equipment and materials proposed on this contract:

[illegible]

BIDDER

Executed this: _____ Day of : _____ 20. _____

By: _____
BIDDER

Title: _____

NOTARY PUBLIC

State of Texas

County of:

Subscribed and sworn to before me this: _____

NOTARY PUBLIC

END OF SECTION

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DOCUMENT 00429

CITY OF EDINBURG NON-BRIBERY MODEL FORM

[*Bidder's letterhead*][*Date*][*Name and address*]Dear [*Name of Owner*] :

The undersigned party certifies that [*Name of bidding company*] complies with the following criteria:

1. They have not engaged and will not engage in bribery of officials related to potential or active City of Edinburg projects.
2. Respondents shall not offer gratuities, favors or any monetary value to any official or employee of the City for purpose of influencing the selection. Any attempt by any Respondent to influence the selection process by any means, other than disclosure of qualifications and credentials through the proper channels, shall be grounds from exclusion from the selection process. Once the project is advertised, there shall be no contact with any city official or employee unless using the formal process through the Purchasing Department. Failure to comply will result in the firm being disqualified from the process.
3. They have corporate policies that clearly prohibit the use of any bribery in a corporate activity.
4. They have neither been convicted of (nor found by a civil judgment to have committed) bribery of domestic officials, fraud, embezzlement, theft, forgery, destruction of records, making false statements to government officials, receiving stolen property, or any other offense indicating a lack of business integrity or business honesty, within five years of the date of this certification.

5.

Printed name

Signature

Position in bidding company

Date

END OF SECTION

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Document 00450

POST-BID PROCEDURES**1.0 DOCUMENT INCLUDES**

- A. Notice of Intent to Award.
- B. Agreement.
- C. Requirements of Bidder.
- D. Failure of Bidder to comply with requirements.
- E. Notice to Proceed.
- F. Pre-construction Conference.
- G. Starting the Project.

2.0 NOTICE OF INTENT TO AWARD

- A. Owner will provide written Notice of Intent to Award (the Contract) to the selected bid or proposal, stating that upon compliance with the conditions listed herein within 14 days after receipt of the notice, and on approval by Owner, Owner will execute and deliver the Agreement.

3.0 FORM OF AGREEMENT

- A. The Agreement shall be Document 00500 - Agreement between the Owner and Contractor, together with Supplements enumerated in and attached thereto.

4.0 REQUIREMENTS OF BIDDER

- A. Within 14 days of receipt of the Notice of Intent to Award, the selected bidder or proposal shall execute and deliver to the Engineer for the Owner's approval those documents indicated by an "X" below:

- ☒ Document 00500 - Agreement Between the Owner and Contractor
- ☒ Document 00610 - Performance Bond (100% of the Contract Amount)
- ☒ Document 00620 - Payment Bond (100% of the Contract Amount)
- ☒ Document 00625 - Affidavit of Insurance (*with Certificate of Insurance attached*)

5.0 FAILURE OF BIDDER TO COMPLY WITH REQUIREMENTS

- A. Should the Bidder on receipt of the Notice of Intent to Award fail to comply with requirements of this Document 00450 within the stated time, the Owner may declare the award in default and require forfeiture of the Security Deposit.
- B. After Owner's written notice of default to the Bidder or proposal, Owner may award the Contract to the responsible Bidder whose offer is the next advantageous bid or proposal, and the Security Deposit of

the Bidder in default shall be forfeited to the Owner in accordance with the provisions of Document 00100 - Instructions to Bidders.

6.0 NOTICE TO PROCEED

- A. Upon Owner's execution of the Agreement and delivery to Contractor, the Engineer shall give the Contractor Notice to Proceed within 30 days after the Effective Date of the Agreement, which notice shall establish the Date of Commencement of the Work.

7.0 PRE-CONSTRUCTION CONFERENCE

- A. Not later than 10 days after the date of Notice to Proceed, but before Contractor starts work at the site, Owner will convene a Pre-construction Conference as specified in Section 01312 - Coordination and Meetings.

8.0 STARTING THE PROJECT

- A. Contractor shall start performance of the Work at the site on the Date of the Commencement of the Work, but no Work shall be done at the site prior to that date.
- B. As Contractor, verify that you and all Subcontractors pay the Prevailing Wage.

END OF DOCUMENT

SECTION 00460

NONCOLLUSION AFFIDAVIT**PART 1 - GENERAL****1.01 SECTION INCLUDES**

This section describes the standardized forms for use in Bidder and Contractor representations and certifications for the project.

1.02 REFERENCES – Not Used**1.03 DEFINITIONS – Section 0700****1.04 REPRESENTATIONS AND CERTIFICATIONS**

- A. Affidavit of Non-collusion
- B. Historically Underutilized Business (HUB) Certification (Bidder to insert appropriate certification notice at the end of this Section).

PART 2 - PRODUCT – Not Used**PART 3 - EXECUTION – Not Used**

STANDARDIZED FORMS FOLLOW

NONCOLLUSION AFFIDAVIT OF PRIME BIDDER

STATE OF TEXAS
COUNTY OF HIDALGO

_____, being first duly sworn, deposes and says that:

(Name)

- (1) He is President of _____, the Bidder that has submitted the attached Bid;
(Company)
- (2) He is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;
- (3) Such Bid is genuine and is not a collusive or sham Bid.
- (4) Neither said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed directly or indirectly with another Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from bidding in connection with such contract, or has in any manner, directly or indirectly sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix an overhead, profit or cost element of the Bid price or the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the **CITY OF EDINBURG**, or any person interested in the proposed Contract; and
- (5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including affiant.

Sign _____

Title _____

Subscribed and sworn to me this _____ day of _____, 20____.

By:

Notary Public
My commission expires

END OF SECTION

Document 00500

AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT

This Agreement is by and between CITY OF EDINBURG ("Owner") and (Contractor Name) ("Contractor").

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

Owner and Contractor hereby agree as follows:

WORK

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

THE PROJECT

- 2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: (Project Number and Name)

ENGINEER

- 3.01 The Owner has retained (Engineer Name) ("Engineer") to act as Owner's representative, assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.
- 3.02 The part of the Project that pertains to the Work has been designed by (Engineer Name).

CONTRACT TIMES

- 4.01 *Time is 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 *Contract Times: Dates*
- A. The Work will be substantially complete on or before (Date), and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before (Date).
- 4.03 *Milestones*
- A. Parts of the Work must be substantially completed on or before the following Milestone(s):

1. Milestone 1 **Substantial Completion / (Date)**
2. Milestone 2 **Final Completion / (Date)**

4.04 *Liquidated Damages*

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the Contract Times, as duly modified. The parties also recognize the delays, expense, and difficulties involved in proving, in a legal proceeding, the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):
1. *Substantial Completion*: Contractor shall pay Owner **based on fees below** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.

For Contract of Amount			Cost Per Day
\$5,000.00	To	\$25,000.00	\$100.00
\$25,000.01	To	\$100,000.00	\$200.00
\$100,000.01	To	\$500,000.00	\$250.00
\$500,000.01	To	\$1,000,000.00	\$300.00
\$1,000,000.01	To	\$2,000,000.00	\$400.00
\$2,000,000.01	To	\$3,000,000.00	\$500.00
\$3,000,000.01	To	\$4,000,000.00	\$600.00
\$4,000,000.01	To	\$5,000,000.00	\$700.00
\$5,000,000.01	And	Over	\$800.00

2. *Completion of Remaining Work*: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner **\$XX** for each day that expires after such time until the Work is completed and ready for final payment.
3. *Milestones*: Contractor shall pay Owner **\$XX** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for achievement of Milestone 1, until Milestone 1 is achieved, or until the time

specified for Substantial Completion is reached, at which time the rate indicated in Paragraph 4.05.A.1 will apply, rather than the Milestone rate.

4. Liquidated damages for failing to timely attain Milestones, Substantial Completion, and final completion are not additive, and will not be imposed concurrently.

- B. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.

4.06 *Special Damages*

- A. Contractor shall reimburse Owner (1) for any fines or penalties imposed on Owner as a direct result of the Contractor's failure to attain Substantial Completion according to the Contract Times, and (2) for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Substantial Completion (as duly adjusted pursuant to the Contract), until the Work is substantially complete.
- B. After Contractor achieves Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times, Contractor shall reimburse Owner for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Work to be completed and ready for final payment (as duly adjusted pursuant to the Contract), until the Work is completed and ready for final payment.
- C. The special damages imposed in this paragraph are supplemental to any liquidated damages for delayed completion established in this Agreement.

CONTRACT PRICE

- 5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents, the amounts that follow, subject to adjustment under the Contract:

- A. For all Work other than Unit Price Work, a lump sum of **\$XX for Alternate 2 and \$XX for Alternate 3 (If applicable).**

All specific cash allowances are included in the above price in accordance with Paragraph 13.02 of the General Conditions.

- B. For all Unit Price Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item).

Unit Price Work (Base Bid)					
Item No.	Description	Unit	Estimated Quantity	Unit Price	Extended Price

00500- 3

Unit Price Work (Base Bid)					
Item No.	Description	Unit	Estimated Quantity	Unit Price	Extended Price
1	24" H.P. DRAIN PIPE (Example)	LF	740	\$46.51	\$34,417.40
Total of all Extended Prices for Unit Price Work (subject to final adjustment based on actual quantities)					\$XX

The extended prices for Unit Price Work set forth as of the Effective Date of the Contract are based on estimated quantities. As provided in Paragraph 13.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer.

- C. Total of Lump Sum Amount and Unit Price Work (subject to final Unit Price adjustment) \$XX.
- D. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

PAYMENT PROCEDURES

6.01 Submittal and Processing of Payments

- A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 Progress Payments; Retainage

- A. Owner shall make progress payments on the basis of Contractor's Applications for Payment on or about the 25th day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in 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 elsewhere in the Contract.

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 Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.

- a. 95 percent of the value of the Work completed (with the balance being retainage).

If 50 percent or more of the Work has been completed, as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and

- b. 95 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

- B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 100 percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 200 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 Final Payment

- A. Upon final completion and acceptance of the Work, Owner shall pay the remainder of the Contract Price in accordance with Paragraph 15.06 of the General Conditions.

6.04 Consent of Surety

- A. Owner will not make final payment, or return or release retainage at Substantial Completion or any other time, unless Contractor submits written consent of the surety to such payment, return, or release.

6.05 Interest

- A. All amounts not paid when due will bear interest at the rate of [number] percent per annum.

CONTRACT DOCUMENTS

7.01 Contents

- A. The Contract Documents consist of all of the following:
 1. This Agreement.
 2. Bonds:
 - a. Performance bond (together with power of attorney).

- b. Payment bond (together with power of attorney).
3. General Conditions.
4. Supplementary Conditions.
5. Specifications as listed in the table of contents of the project manual (copy of list attached).
6. Drawings (not attached but incorporated by reference) consisting of **(Number of Sheets)** sheets with each sheet bearing the following general title: **(Project Name)**.
7. **Addenda (numbers 1 to 2, inclusive).**
8. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
 - a. Notice to Proceed.
 - b. Work Change Directives.
 - c. Change Orders.
 - d. Field Orders.
 - e. Warranty Bond, if any.
- B. The Contract Documents listed in Paragraph 7.01.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 7.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the Contract.

REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

8.01 Contractor's Representations

- A. In order to induce Owner to enter into this Contract, Contractor makes the following representations:
 1. Contractor has examined and carefully studied the Contract Documents, including Addenda.
 2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 3. Contractor is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
 4. Contractor has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.

5. Contractor has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
6. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (c) Contractor's safety precautions and programs.
7. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no 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.
8. 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.
9. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
10. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
11. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

8.02 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.02:
 1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-

competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

8.03 *Standard General Conditions*

- A. Owner stipulates that if the General Conditions that are made a part of this Contract are EJCDC® C-700, Standard General Conditions for the Construction Contract (2018), published by the Engineers Joint Contract Documents Committee, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on **(Month) (Date), (Year)** (which is the Effective Date of the Contract).

Owner:

City of Edinburg

(typed or printed name of organization)

By:

(individual's signature)

Date:

(date signed)

Name:

(typed or printed)

Title:

(typed or printed)

Attest:

(individual's signature)

Title:

(typed or printed)

Address for giving notices:

City of Edinburg

415 W. University Drive

Edinburg, TX 78539

Designated Representative:

Name:

(typed or printed)

Title:

(typed or printed)

Address:

Phone:

Email:

(If City of Edinburg is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

Contractor:

(typed or printed name of organization)

By:

(individual's signature)

Date:

(date signed)

Name:

(typed or printed)

Title:

(typed or printed)

*(If **(Contractor Name)** is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)*

Attest:

(individual's signature)

Title:

(typed or printed)

Address for giving notices:

Designated Representative:

Name:

(typed or printed)

Title:

(typed or printed)

Address:

Phone:

Email:

License No.:

(where applicable)

State:

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SECTION 00510

NOTICE OF AWARD**PART 1 - GENERAL****1.01 SECTION INCLUDES**

This section describes the standardized Notice of Award form for use in the project.

1.02 REFERENCES – Not Used**1.03 DEFINITIONS – Section 0700****PART 2 - PRODUCT – Not Used****PART 3 - EXECUTION (FORMS ON FOLLOWING PAGES)**

STANDARDIZED FORM FOLLOWS

NOTICE OF AWARD

Date

Owner: City of Edinburg

Owner's Project No.: 2019-82

Engineer: Ricardo Hinojosa, P.E.

Project: Replacement of Los Venados Standpipe

Bidder: Name

Bidder's Address: Address

You are notified that Owner has accepted your Proposal dated **(Date)** for the above Contract, and that you are the Successful Proposal and are awarded a Contract for:

Base Proposal

The Contract Price of the awarded Contract is **(Contract Amount)**. Contract Price is subject to adjustment based on the provisions of the Contract, including but not limited to those governing changes, Unit Price Work, and Work performed on a cost-plus-fee basis, as applicable.

Four (4) unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award, or has been transmitted or made available to Bidder electronically.

☒ Drawings will be delivered separately from the other Contract Documents by Engineer of Record.

You must comply with the following conditions precedent within 15 days of the date of receipt of this Notice of Award:

1. Deliver to Owner **four (4)** counterparts of the Agreement, signed by Bidder (as Contractor).
2. Deliver with the signed Agreement(s) the Contract security (such as required performance and payment bonds) and insurance documentation, as specified in the Instructions to Bidders and in the General Conditions, Articles 2 and 6.

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 10 days after you comply with the above conditions, Owner will return to you one fully signed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner: **City of Edinburg**

By *(signature)*: _____

Name *(printed)*: Mardoqueo Hinojosa, P.E., CFM, CPM

Title: City Engineer

Cc: Hinojosa Engineering, Inc.

END OF SECTION

SECTION 00550

NOTICE TO PROCEED**PART 1 - GENERAL****1.01 SECTION INCLUDES**

This section describes the standardized Notice to Proceed form for use in the project.

1.02 REFERENCES – Not Used**1.03 DEFINITIONS – Section 0700****PART 2 - PRODUCT – Not Used****PART 3 - EXECUTION**

TO BE ISSUED BY ENGINEER

NOTICE TO PROCEED**Date:****To:****Project No.:** 2019-82**Project:** Replacement of Los Venados Standpipe

You are notified that the Contract Time under the above contract will commence to run on _____. By this date you are to start performing your obligations under the Contract Documents.

In accordance with the Agreement the date of Substantial Completion is _____ and Final Completion is _____, respectively.

Before you may start any Work at the site, the General Conditions and Contract Documents provides that you and Owner must each deliver to the other (with copies to ENGINEER) 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

1. Notify the City 48 hours prior to beginning construction.
2. Setup construction barricades.
3. Setup erosion control measures.
4. _____
5. _____

Copy to ENGINEER:

ENGINEER: Hinojosa Engineering, Inc.

OWNER: City of Edinburg

By _____
Ricardo Hinojosa, P.E.

By _____
Juan G. Guerra

President
Title

City Manager
Title

ACCEPTANCE OF NOTICE BY BIDDER

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by _____,
this the _____ day of _____, 20____. (Contractor)

BY: _____

TITLE: _____

END OF SECTION

PERFORMANCE BOND

Contractor Name: [Full formal name of Contractor] Address <i>(principal place of business)</i> : [Address of Contractor's principal place of business]	Surety Name: [Full formal name of Surety] Address <i>(principal place of business)</i> : [Address of Surety's principal place of business]
Owner Name: City of Edinburg Mailing address <i>(principal place of business)</i> : 415 W. University Drive Edinburg, TX. 78539	Contract Description <i>(name and location)</i> : 2019-82 / Replacement of Los Venados Standpipe 22860 N. Highway 281 Edinburg, TX. 78542 Contract Price: [Amount from Contract] Effective Date of [Date from Contract: Contract]
Bond Bond [Amount] Date of Bond: [Date] <i>(Date of Bond cannot be earlier than Effective Date of Contract)</i> Modifications to this Bond form: <input type="checkbox"/> None <input type="checkbox"/> See Paragraph 16	
Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Performance Bond, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.	
Contractor as Principal	Surety
<i>(Full formal name of Contractor)</i>	<i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature)(Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
<i>Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.</i>	

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.
2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond will arise after:
 - 3.1. The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice may indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 will be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement does not waive the Owner's right, if any, subsequently to declare a Contractor Default;
 - 3.2. The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
 - 3.3. The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.
4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 does not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.
5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
 - 5.1. Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;
 - 5.2. Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;
 - 5.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to

- the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or
- 5.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
 - 5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
 - 5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.
 6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment, or the Surety has denied liability, in whole or in part, without further notice, the Owner shall be entitled to enforce any remedy available to the Owner.
 7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner will not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety will not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:
 - 7.1. the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
 - 7.2. additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and
 - 7.3. liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.
 8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.
 9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price will not be reduced or set off on account of any such unrelated obligations. No right of action will accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.
 10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
 11. Any proceeding, legal or equitable, under this Bond must be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and must be instituted within two years after a declaration of Contractor Default or within two

years after the Contractor ceased working or within two years after the 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 periods of limitations available to sureties as a defense in the jurisdiction of the suit will be applicable.

12. Notice to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears.
13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted therefrom and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.
14. Definitions
 - 14.1. *Balance of the Contract Price*—The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.
 - 14.2. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.
 - 14.3. *Contractor Default*—Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.
 - 14.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
 - 14.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.
15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.
16. Modifications to this Bond are as follows: **[None]**

PAYMENT BOND

Contractor Name: [Full formal name of Contractor] Address <i>(principal place of business)</i> : [Address of Contractor's principal place of business]	Surety Name: [Full formal name of Surety] Address <i>(principal place of business)</i> : [Address of Surety's principal place of business]
Owner Name: City of Edinburg Mailing address <i>(principal place of business)</i> : 415 W. University Drive Edinburg, TX. 78539	Contract Description <i>(name and location)</i> : 2019-82/Replacement of Los Venados Standpipe 22860 N. Highway 281 Edinburg, TX. 78542 Contract Price: [Amount, from Contract] Effective Date of Contract: [Date, from Contract]
Bond Bond [Amount] Date of Bond: [Date] <i>(Date of Bond cannot be earlier than Effective Date of Contract)</i> Modifications to this Bond form: <input type="checkbox"/> None <input type="checkbox"/> See Paragraph 18	
Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Payment Bond, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.	
Contractor as Principal	Surety
_____ <i>(Full formal name of Contractor)</i>	_____ <i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <div style="text-align: center;"><i>(Signature)</i></div>	By: _____ <div style="text-align: center;"><i>(Signature)(Attach Power of Attorney)</i></div>
Name: _____ <div style="text-align: center;"><i>(Printed or typed)</i></div>	Name: _____ <div style="text-align: center;"><i>(Printed or typed)</i></div>
Title: _____	Title: _____
Attest: _____ <div style="text-align: center;"><i>(Signature)</i></div>	Attest: _____ <div style="text-align: center;"><i>(Signature)</i></div>
Name: _____ <div style="text-align: center;"><i>(Printed or typed)</i></div>	Name: _____ <div style="text-align: center;"><i>(Printed or typed)</i></div>
Title: _____	Title: _____
<i>Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.</i>	

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond will arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond will arise after the following:
 - 5.1. Claimants who do not have a direct contract with the Contractor
 - 5.1.1. have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - 5.1.2. have sent a Claim to the Surety (at the address described in Paragraph 13).
 - 5.2. Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
 - 7.1. Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
 - 7.2. Pay or arrange for payment of any undisputed amounts.
 - 7.3. The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 will not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire

as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation will not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond will be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract will be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfying obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
12. No suit or action will be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, 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 will be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted here from and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. Definitions

16.1. *Claim*—A written statement by the Claimant including at a minimum:

16.1.1. The name of the Claimant;

16.1.2. The name of the person for whom the labor was done, or materials or equipment furnished;

16.1.3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;

16.1.4. A brief description of the labor, materials, or equipment furnished;

16.1.5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;

16.1.6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;

16.1.7. The total amount of previous payments received by the Claimant; and

16.1.8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2. *Claimant*—An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond is to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the 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.

16.3. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

16.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.

Modifications to this Bond are as follows: **[None]**

Document 00625

AFFIDAVIT OF INSURANCE

THE STATE OF TEXAS

§
§ KNOW ALL MEN BY THESE PRESENTS:

THE COUNTY OF _____

BEFORE ME, the undersigned authority, on this day personally appeared_____, who
[Affiant]being by me duly sworn on his oath stated that he is _____, of
[Title]_____
[Contractor's Company Name]

the Contractor named and referred to within the Contract Documents; that he is fully competent and authorized to give this affidavit and that the attached original insurance certificate truly and accurately reflects the insurance coverage that is now available and will be available during the term of the Agreement.

[Affiant's Signature]SWORN AND SUBSCRIBED before me on _____.
[Date]_____
Notary Public in and for the State of TEXAS_____
[Print or type Notary Public name]

[Notary Seal]

My Commission Expires: _____
[Expiration Date]

END OF DOCUMENT

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Document 00630

FORM OF BUSINESS

Please, fill in the appropriate area describing your firm's form of business and include the relevant attachments.

Corporation:

Corporate Name: _____

State of Incorporation: _____

Mailing Address: _____

- Certificate of Assumed Name, if operating under a name different than that on the corporate charter (the Certificate must have been issued within the past ten years to be valid)
- Certificate of Good Standing*
- Certificate of Existence (if non-Texas corporation, Certificate of Authority) *

Partnership/Joint Venture:

Partnership/Joint Venture Name: _____

Mailing Address: _____

- Copy of the Partnership or Joint Venture Agreement, or Affidavit with the name of the partnership or joint venture, the names of the individual partners or participants in the joint venture, and a statement that the partnership or joint venture is in existence
- Certificate of Assumed Name, (the Certificate must have been issued within the past ten years to be valid)
- If firm is a limited partnership, the Certificate of Limited Partnership
- If any partner or joint venturer is a corporation, the above information relating to corporation must be included as to each sum partner or joint venturer.

Sole Proprietorship

Name: _____

Mailing Address: _____

- Certificate of Assumed Name, if operating under a name different than that of the sole proprietor (the Certificate must have been issued within the past ten years to be valid)

* *Must be furnished upon request of the Owner and must be less than 90 days old.*

[Typed Name and Title of Authorized Representative]_____
[Signature of Authorized Representative]_____
[Typed Date]**END OF DOCUMENT**

00630- 1 of 2

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Document 00631

RESOLUTION OF CORPORATION

I hereby certify that it was RESOLVED by a quorum of the directors of

[Name of Corporation / Contractor]

meeting on this _____ day of _____, 20____, that _____,
[Corporate Representative]

be, and hereby is, authorized to act on behalf of the Corporation, as its representative, in all business transactions conducted in the State of Texas, and that the above resolution was unanimously ratified by the Board of Directors at said meeting and that the resolution has not been rescinded or amended and is now in full force and effect; and in authentication of the adoption of this resolution, I subscribe my name and affix the seal of the Corporation on this

_____ day of, _____, 20____.

Secretary/Assistant Secretary

[Seal]

END OF DOCUMENT

00631- 1 of 2

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**CONTRACTOR'S RESOLUTION
ON
AUTHORIZED REPRESENTATIVE (ED-104)**

Name or Names

I hereby certify that it was RESOLVED by a quorum of the directors of the

_____, meeting
name of corporation

on the day of _____, 20__, that _____,

_____, and _____, be, and hereby is,

authorized to act on behalf of _____, as its
name of corporation

representative, in all business transactions conducted in the State of Texas, and;

That all above resolution was unanimously ratified by the Board of Directors at said

meeting and that the resolution has not been rescinded or amended and is now in full forces

and effect; and;

In authentication of the adoption of this resolution, I subscribe my name and

affix the seal of the corporation this _____ day of _____, 20__.

Secretary

(seal)

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Document 00635

CONTRACTOR'S ACT OF ASSURANCE

THE STATE OF TEXAS

KNOW ALL MEN BY THESE PRESENTS:

THE COUNTY OF _____

BEFORE ME, the undersigned authority, a Notary Public in and for the State of Texas,

on this day personally appeared _____, Affiant,
[Affiant]who being by me duly sworn on his oath stated that he is _____, of
[Title]the _____, Contractor, that he is authorized to represent Contractor
[Contractor]pursuant to provisions of a resolution adopted on this _____ day of _____, 20____. A duly
certified copy of such resolution is attached to and is hereby made a part of this document.Affiant, in such capacity declares and assures the City of Edinburg that Contractor will construct the Project
in accordance with sound construction practice and all laws of the State of Texas._____
[Affiant]

SWORN AND SUBSCRIBED before me on this _____ day of _____, 20____.

Notary Public in and for the State of TEXAS_____
[Print or Type Notary Public Name]My Commission Expires: _____
[Expiration Date]_____
[Seal]**END OF DOCUMENT**

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Document 00640

**CERTIFICATION REGARDING DEPARTMENT,
SUSPENSION AND OTHER RESPONSIBILITY MATTERS**

The prospective participant certifies to the best of its knowledge and belief that it and its principals:

- (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal, State, or local department or agency;
- (b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction: violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- (c) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (b) of this certification; and
- (d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

I understand that a false statement on this certification may be grounds for rejection of this proposal or termination of the award. In addition, under 18 USC Section 1001, a false statement may result in a fine of up to \$10,000 or imprisonment for up to 5 years, or both.

[Typed Name of Company:]

[Typed Name & Title of Authorized Representative]

[Signature of Authorized Representative]

[Date]

If unable certify the above statements, explanation is attached.

END OF DOCUMENT

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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 Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared By



Endorsed By



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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

TABLE OF CONTENTS

	Page
Article 1—Definitions and Terminology.....	1
1.01 Defined Terms.....	1
1.02 Terminology	6
Article 2—Preliminary Matters	7
2.01 Delivery of Performance and Payment Bonds; Evidence of Insurance.....	7
2.02 Copies of Documents	7
2.03 Before Starting Construction	8
2.04 Preconstruction Conference; Designation of Authorized Representatives.....	8
2.05 Acceptance of Schedules	8
2.06 Electronic Transmittals	9
Article 3—Contract Documents: Intent, Requirements, Reuse.....	9
3.01 Intent.....	9
3.02 Reference Standards	10
3.03 Reporting and Resolving Discrepancies	10
3.04 Requirements of the Contract Documents.....	11
3.05 Reuse of Documents	11
Article 4—Commencement and Progress of the Work	12
4.01 Commencement of Contract Times; Notice to Proceed.....	12
4.02 Starting the Work.....	12
4.03 Reference Points	12
4.04 Progress Schedule	12
4.05 Delays in Contractor’s Progress	12
Article 5—Site; Subsurface and Physical Conditions; Hazardous Environmental Conditions	14
5.01 Availability of Lands	14
5.02 Use of Site and Other Areas.....	14
5.03 Subsurface and Physical Conditions.....	15
5.04 Differing Subsurface or Physical Conditions	16

5.05	Underground Facilities	18
5.06	Hazardous Environmental Conditions at Site	19
Article 6—Bonds and Insurance.....		22
6.01	Performance, Payment, and Other Bonds	22
6.02	Insurance—General Provisions	22
6.03	Contractor’s Insurance	24
6.04	Builder’s Risk and Other Property Insurance	25
6.05	Property Losses; Subrogation	26
6.06	Receipt and Application of Property Insurance Proceeds	27
Article 7—Contractor’s Responsibilities		27
7.01	Contractor’s Means and Methods of Construction	27
7.02	Supervision and Superintendence	28
7.03	Labor; Working Hours	28
7.04	Services, Materials, and Equipment	28
7.05	“Or Equals”	29
7.06	Substitutes	30
7.07	Concerning Subcontractors and Suppliers	31
7.08	Patent Fees and Royalties	32
7.09	Permits	33
7.10	Taxes	33
7.11	Laws and Regulations.....	33
7.12	Record Documents.....	34
7.13	Safety and Protection.....	34
7.14	Hazard Communication Programs	35
7.15	Emergencies	35
7.16	Submittals	36
7.17	Contractor’s General Warranty and Guarantee	38
7.18	Indemnification	39
7.19	Delegation of Professional Design Services	40
Article 8—Other Work at the Site		41
8.01	Other Work	41
8.02	Coordination	41
8.03	Legal Relationships.....	42

Article 9—Owner’s Responsibilities	43
9.01 Communications to Contractor	43
9.02 Replacement of Engineer	43
9.03 Furnish Data	43
9.04 Pay When Due	43
9.05 Lands and Easements; Reports, Tests, and Drawings	43
9.06 Insurance	43
9.07 Change Orders	43
9.08 Inspections, Tests, and Approvals	44
9.09 Limitations on Owner’s Responsibilities	44
9.10 Undisclosed Hazardous Environmental Condition	44
9.11 Evidence of Financial Arrangements	44
9.12 Safety Programs	44
Article 10—Engineer’s Status During Construction	44
10.01 Owner’s Representative	44
10.02 Visits to Site	44
10.03 Resident Project Representative	45
10.04 Engineer’s Authority	45
10.05 Determinations for Unit Price Work	45
10.06 Decisions on Requirements of Contract Documents and Acceptability of Work	45
10.07 Limitations on Engineer’s Authority and Responsibilities	45
10.08 Compliance with Safety Program	46
Article 11—Changes to the Contract	46
11.01 Amending and Supplementing the Contract	46
11.02 Change Orders	46
11.03 Work Change Directives	47
11.04 Field Orders	47
11.05 Owner-Authorized Changes in the Work	47
11.06 Unauthorized Changes in the Work	48
11.07 Change of Contract Price	48
11.08 Change of Contract Times	49
11.09 Change Proposals	49
11.10 Notification to Surety	51

Article 12—Claims.....	51
12.01 Claims.....	51
Article 13—Cost of the Work; Allowances; Unit Price Work	52
13.01 Cost of the Work	52
13.02 Allowances	56
13.03 Unit Price Work.....	56
Article 14—Tests and Inspections; Correction, Removal, or Acceptance of Defective Work	57
14.01 Access to Work.....	57
14.02 Tests, Inspections, and Approvals.....	57
14.03 Defective Work	58
14.04 Acceptance of Defective Work.....	58
14.05 Uncovering Work	59
14.06 Owner May Stop the Work	59
14.07 Owner May Correct Defective Work.....	59
Article 15—Payments to Contractor; Set-Offs; Completion; Correction Period	60
15.01 Progress Payments.....	60
15.02 Contractor’s Warranty of Title	63
15.03 Substantial Completion.....	63
15.04 Partial Use or Occupancy	64
15.05 Final Inspection	65
15.06 Final Payment.....	65
15.07 Waiver of Claims	66
15.08 Correction Period	67
Article 16—Suspension of Work and Termination	68
16.01 Owner May Suspend Work	68
16.02 Owner May Terminate for Cause.....	68
16.03 Owner May Terminate for Convenience.....	69
16.04 Contractor May Stop Work or Terminate	69
Article 17—Final Resolution of Disputes	70
17.01 Methods and Procedures.....	70
Article 18—Miscellaneous	70
18.01 Giving Notice	70
18.02 Computation of Times	70

18.03	Cumulative Remedies	70
18.04	Limitation of Damages	71
18.05	No Waiver	71
18.06	Survival of Obligations	71
18.07	Controlling Law	71
18.08	Assignment of Contract	71
18.09	Successors and Assigns	71
18.10	Headings.....	71

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. 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, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 8. *Change Order*—A document 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, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 10. *Claim*
 - a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract Price or Contract Times; contesting an initial decision by

Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.

- b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.
 - c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.
 - d. A demand for money or services by a third party is not a Claim.
11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.
13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.
15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
17. *Cost of the Work*—See Paragraph 13.01 for definition.
18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.
21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or

communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.
23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.
 - a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.
 - b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.
 - c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.
25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.
28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
29. *Notice to Proceed*—A written notice 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.
30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.

32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.
34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals.
36. *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.
37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
38. *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, and such other lands or areas furnished by Owner which are designated for the use of Contractor.
39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
40. *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.
41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers' instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.
42. *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 of such Work.

43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.
44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
45. *Supplier*—A manufacturer, fabricator, supplier, distributor, 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 a Subcontractor.
46. *Technical Data*
- a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.
 - b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.
 - c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.
47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.
48. *Unit Price Work*—Work to be paid for on the basis of unit prices.
49. *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; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives*: 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 information in the Contract Documents and with the design concept of the 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 Article 10 or any other provision of the Contract Documents.
- C. *Day*: The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective*: The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - 1. does not conform to the Contract Documents;
 - 2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - 3. 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 15.03 or Paragraph 15.04).
- E. *Furnish, Install, Perform, Provide*
 - 1. The word “furnish,” when used in connection with services, materials, or equipment, means 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, means 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, means to furnish and install said services, materials, or equipment complete and ready for intended use.

- 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.
- F. *Contract Price or Contract Times*: References to a change in “Contract Price or Contract Times” or “Contract Times or Contract Price” or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term “or both” is not expressed.
- G. Unless stated otherwise in the Contract Documents, words or phrases that 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 Performance and Payment Bonds; Evidence of Insurance*

- A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.
- C. *Evidence of Owner’s Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), 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;
 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.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- 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 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *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 the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will 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 the component parts of the Work.
 4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.
- B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one Contract Document 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.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.
- F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will 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.
- G. Nothing in the Contract Documents creates:
 - 1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or
 - 2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

3.02 *Reference Standards*

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

1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract 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, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer 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 part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then 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 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
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 had actual knowledge thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer take

precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:

- a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); 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 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.
- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers 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 its consultants, including electronic media versions, or reuse any 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 adaptation by Engineer; or
 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein precludes Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract 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 Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

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

4.03 *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.

4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 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 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, 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 Contract Price or Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 2. Abnormal weather conditions;
 3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and
 4. Acts of war or terrorism.
- D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:
1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.
 2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.
 3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.
- E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:
1. The circumstances that form the basis for the requested adjustment;
 2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;
 3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;
 4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and
 5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.

Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the

effect of the delay, disruption, or interference on the critical path to completion of the Work.

- F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.
- G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor in writing 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.
- 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 permanent improvements are to be made 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.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

- 1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
- 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise;

(b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all 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 directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will 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 and adjacent areas 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 of 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 structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
 - 1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;
 - 2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and
 - 3. Technical Data contained in such reports and drawings.
- B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.
- C. *Reliance by Contractor on Technical Data:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

- D. *Limitations of Other Data and Documents:* Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, 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;
 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;
 3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or
 4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;
 2. is of such a nature as to require a change in the Drawings or Specifications;
 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 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement

to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

- D. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

E. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, 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 fall within any one or more of the categories described in Paragraph 5.04.A;
 - 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 Paragraph 13.03; and,
 - c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a 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 otherwise;
 - b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice required by Paragraph 5.04.A.
3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

- F. *Underground Facilities; Hazardous Environmental Conditions*: Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities.

Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:
1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 2. complying with applicable state and local utility damage prevention Laws and Regulations;
 3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;
 4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then 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 7.15), notify Owner and Engineer in writing regarding such Underground Facility.
- C. *Engineer's Review:* Engineer will:
1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;
 2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;
 3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and
 4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written

statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.

- E. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

F. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. 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 Paragraph 13.03;
 - b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and
 - c. Contractor gave the notice required in Paragraph 5.05.B.
2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.
4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

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

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;

2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
 3. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, 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;
 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 removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) 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. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. 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, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.
- H. 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, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, 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, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, 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 failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.
- B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.
- C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or Regulations, and must be issued and signed by a surety named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.
- E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.
- F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.
- H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the

required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

- C. Alternative forms of insurance coverage, including but not limited to self-insurance and "Occupational Accident and Excess Employer's Indemnity Policies," are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.
- D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.
- E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.
- F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.
- H. Contractor shall require:
 - 1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and

2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.
- I. If either party does not purchase or maintain the insurance required of such party by the Contract, 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.
- J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.
- K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.
- L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.
- M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.
- N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 *Contractor's Insurance*

- A. *Required Insurance:* Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.
- B. *General Provisions:* The policies of insurance required by this Paragraph 6.03 as supplemented must:
 1. include at least the specific coverages required;
 2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;
 3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;

4. apply with respect to the performance of the Work, whether such performance is 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; and
 5. include all necessary endorsements to support the stated requirements.
- C. *Additional Insureds*: The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:
1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;
 2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;
 3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);
 4. not seek contribution from insurance maintained by the additional insured; and
 5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

- A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.
- B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.
- C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.

- D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.
- E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

- A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.
 - 1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, 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, risks, 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 Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.
 - 2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.

1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, 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 fire or any of the perils, risks, or causes of loss covered by such policies.
- C. The waivers in this Paragraph 6.05 include the waiver of rights 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 insured peril, risk, or cause of loss.
- D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, 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 fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

- A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at

Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *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.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *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 maintain good discipline and order at the Site.
- B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.
- C. 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 will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.04 *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, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will 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 must 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.

7.05 “Or Equals”

- A. *Contractor’s Request; Governing Criteria:* Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item 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 is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.
1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an “or equal” item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that the proposed item:
 - 1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) 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) has a proven record of performance and availability of responsive service; and
 - 4) is not objectionable to Owner.
 - b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor’s Expense:* Contractor shall provide all data in support of any proposed “or equal” item at Contractor’s expense.
- C. *Engineer’s Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each “or-equal” request. Engineer may require Contractor to furnish additional data about the proposed “or-equal” item. Engineer will be the sole judge of acceptability. No “or-equal” item will be ordered, furnished, installed, or utilized until Engineer’s review is complete and Engineer determines that the proposed item is an “or-equal,” which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
- D. *Effect of Engineer’s Determination:* Neither approval nor denial of an “or-equal” request will result in any change in Contract Price. The Engineer’s denial of an “or-equal” request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.

- E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an “or-equal” item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 *Substitutes*

- A. *Contractor’s Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.
1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.
 2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
 3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:
 - a. will certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design;
 - 2) be similar in substance to the item specified; and
 - 3) be suited to the same use as the item specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;
 - 2) whether 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
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from the item specified; and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in

Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

- B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable 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.
- E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.
- B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or

otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.

- E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.
- F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.
- J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.
- K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.
- L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.
- M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *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 an 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 will be disclosed in the Contract Documents.

- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors, 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 specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, 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.

7.09 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. 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 the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.10 *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.

7.11 *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. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, 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

such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.

- C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

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

7.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.
- B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.
- C. 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, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.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 at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer 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).

- E. 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.
- F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
- G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.
- H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).
- J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as 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.

7.15 *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 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 by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 Submittals

A. Shop Drawing and Sample Requirements

1. Before submitting a Shop Drawing or Sample, Contractor shall:
 - a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determine and verify:
 - 1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;
 - 2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - 3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;
 - c. confirm that the Submittal is complete with respect to all related data included in the Submittal.
2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.
3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.

B. Submittal Procedures for Shop Drawings and Samples: Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.

1. Shop Drawings

- a. Contractor shall submit the number of copies required in the Specifications.
- b. Data shown on the Shop Drawings must 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 7.16.C.

2. Samples

- a. Contractor shall submit the number of Samples required in the Specifications.
- b. Contractor shall 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 7.16.C.

3. 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. Engineer's Review of Shop Drawings and Samples

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. 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, comply with the requirements of 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, or to safety precautions or programs incident thereto.
3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.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 will document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.
5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.
8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

D. Resubmittal Procedures for Shop Drawings and Samples

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.
2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two

resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. *Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs*

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:
 - a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.
 - b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.
 - c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.
 - d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.
2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03, 2.04, and 2.05.

- F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 *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 is entitled to rely on Contractor's warranty and guarantee.
- B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:
 1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and

2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.
- C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
1. abuse, or improper modification, 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.
- D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:
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;
 6. The issuance of a notice of acceptability by Engineer;
 7. The end of the correction period established in Paragraph 15.08;
 8. Any inspection, test, or approval by others; or
 9. Any correction of defective Work by Owner.
- E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (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 from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage 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 officers, directors, members, partners, employees, agents, consultants, or subcontractors, 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 7.18.A will 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.

7.19 *Delegation of Professional Design Services*

- A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.
- B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.
- C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.
- D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.
- E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:
 - 1. Checking for conformance with the requirements of this Paragraph 7.19;
 - 2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and
 - 3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.
- F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.

- G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.
- D. 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 such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.
- E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, 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.
- F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be

set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 2. An itemization of the specific matters to be covered by such authority and responsibility; and
 3. The extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

- A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.
- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.
1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.
 2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.

- C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all 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 damage, delay, disruption, or interference.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

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

9.02 *Replacement of Engineer*

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents will be that of the former Engineer.

9.03 *Furnish Data*

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

9.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *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.

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *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.

10.02 *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 10.07. 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.

10.03 *Resident Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.
- B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

- A. Engineer has the authority to reject Work in accordance with Article 14.
- B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.
- C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.
- D. Engineer's authority as to changes in the Work is set forth in Article 11.
- E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

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

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.07 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, 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, will 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 Contractor under Paragraph 15.06.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 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs of which Engineer has been informed.

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

- A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
- B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.
- C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
 - 1. Changes in 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;
 - 2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;

3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and
 4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

- A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.
- B. If Owner has issued a Work Change Directive and:
1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.
 2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

- A. Engineer may authorize minor changes in the Work if the changes 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. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.
- B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-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. Changes involving

the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.

- B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.
- C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *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, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

11.07 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.
- B. 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, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);
 - 2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or
 - 3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).
- C. *Contractor's Fee:* When applicable, the Contractor's fee for overhead and profit will 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 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;
 - b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 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 Paragraphs 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;
- d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
- e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
- f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.
- B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

- A. *Purpose and Content:* Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

B. *Change Proposal Procedures*

1. *Submittal*: Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.
2. *Supporting Data*: The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.
 - a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.
 - b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

3. *Engineer's Initial Review*: Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.
 4. *Engineer's Full Review and Action on the Change Proposal*: Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.
 5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.
- D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety 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), 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.

ARTICLE 12—CLAIMS

12.01 *Claims*

- A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:
 - 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 - 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;
 - 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and
 - 4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.
- B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.
- C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation*
 - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.
 - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal

and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 Cost of the Work

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
 2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:
 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 in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe

benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will 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 accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will 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, which 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 will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.
5. Other costs consisting of 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, 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.
 - 1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.
 - c. *Construction Equipment Rental*
 - 1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment,

machinery, or parts must cease when the use thereof is no longer necessary for the Work.

- 2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.
 - 3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.
- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as 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 builder's risk or other property insurance established in accordance with Paragraph 6.04), 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 include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will 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 communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
 - i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.
- C. *Costs Excluded*: The term Cost of the Work does not include any of the following items:
1. Payroll costs and other compensation of Contractor's officers, executives, principals, general 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 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. The cost of purchasing, renting, or furnishing small tools and hand tools.
3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
5. 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.
6. Expenses incurred in preparing and advancing Claims.
7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. Contractor's Fee

1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:
 - a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.
 - b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:
 - 1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.
 - 2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.
2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

- E. Documentation and Audit:** Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 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*: Contractor agrees that:
 - 1. 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
 - 2. 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 for any of the foregoing will be valid.
- C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's 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 for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

13.03 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. Payments to Contractor for Unit Price Work will be based on actual quantities.
- 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. 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, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.
- E. *Adjustments in Unit Price*
 - 1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
 - a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

- b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

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

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.
- 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, obtaining, and paying for all inspections and tests required:
 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 3. by manufacturers of equipment furnished under the Contract Documents;
 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. 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, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved

by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

- A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then 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, and provide all necessary labor, material, and equipment.
 - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages 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 pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
 - 2. 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, 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, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *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, then 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 will 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.

14.07 *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 defective Work as required by Engineer, then

Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.

- B. In exercising the rights and remedies under this Paragraph 14.07, 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, 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 incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. 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 14.07.

ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *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.
 - 2. 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 must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
4. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. Review of Applications

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, 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 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, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and 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; or
 - b. 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;
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;

- c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; 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 15.01.C.2.
 6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
 - e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*

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

E. *Reductions in Payment by Owner*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
 - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;

- e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. The Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. The Contract Price has been reduced by Change Orders;
 - i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;
 - j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. 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; or
 - l. Other items entitle Owner to a set-off against the amount recommended.
2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, 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, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.
 3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *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 and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
- 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 preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.
- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

- 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. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.

2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work 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 15.03 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 6.04 regarding builder's risk or other property insurance.

15.05 *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, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *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, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.
2. The final Application for Payment must be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
 - d. a list of all duly pending Change Proposals and Claims; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment

bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, 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, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

- B. *Engineer's Review of Final Application and Recommendation of Payment:* 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 have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. 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. *Notice of Acceptability:* In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.
- D. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.
- E. *Final Payment Becomes Due:* Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

- A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim, appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.
- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *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 Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such adjacent areas;
 - 2. correct such defective Work;
 - 3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.
- B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.
- C. If, after receipt of a notice of defect within 60 days and within the correction period, 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. Contractor shall pay all 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). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.
- D. 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.
- E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, 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.
- F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *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 written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and 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);
 - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:
 - 1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and
 - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, 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 complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.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 the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds 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.

- F. 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, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

- A. Upon 7 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; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 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 16.03.
- 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, 7 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 are not intended to preclude Contractor from submitting a Change Proposal 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 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this article:
 - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and
 - 2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this article, Owner or Contractor may:
 - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;
 - 2. agree with the other party to submit the dispute to another dispute resolution process; or
 - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

- A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:
 - 1. in person, by a commercial courier service or otherwise, to the recipient's place of business;
 - 2. by registered or certified mail, postage prepaid, to the recipient's place of business; or
 - 3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

- A. When any period of time is referred to in the Contract 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.

18.03 *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. 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.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination of the Contract or of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is 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.

18.09 *Successors and Assigns*

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

18.10 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

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 Laws and Regulations.

SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared By



Endorsed By



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SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

TABLE OF CONTENTS

	Page
Article 1— Definitions and Terminology.....	1
Article 2— Preliminary Matters	1
Article 3— Contract Documents: Intent, Requirements, Reuse	1
Article 4— Commencement and Progress of the Work	1
Article 5— Site, Subsurface and Physical Conditions, Hazardous Environmental Conditions	2
Article 6— Bonds and Insurance	2
Article 7— Contractor’s Responsibilities	6
Article 8— Other Work at the Site	7
Article 9— Owner’s Responsibilities	7
Article 10— Engineer’s Status During Construction	7
Article 11— Changes to the Contract	8
Article 12— Claims	8
Article 13— Cost of Work; Allowances, Unit Price Work.....	8
Article 14— Tests and Inspections; Correction, Removal, or Acceptance of Defective Work.....	9
Article 15— Payments to Contractor, Set Offs; Completions; Correction Period	9
Article 16— Suspension of Work and Termination	10
Article 17— Final Resolutions of Disputes	10
Article 18— Miscellaneous	10
Exhibit A— Software Requirements for Electronic Document Exchange	Error! Bookmark not defined.
Exhibit B— Foreseeable Bad Weather Days	Error! Bookmark not defined.
Exhibit C— Geotechnical Baseline Report Supplement to the Supplementary Conditions	Error! Bookmark not defined.

SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

These Supplementary Conditions amend or supplement EJCDC® C-700, Standard General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

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.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added—for example, "Paragraph SC-4.05."

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

No suggested Supplementary Conditions in this Article.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

SC-2.01 Delete Paragraphs 2.01.B. and C. in their entirety and insert the following in their place:

- B. *Evidence of Contractor's Insurance:* When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner copies of the policies (including all endorsements, and identification of applicable self-insured retentions and deductibles) of insurance required to be provided by Contractor in this Contract. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- C. *Evidence of Owner's Insurance:* After receipt from Contractor of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor copies of the policies of insurance to be provided by Owner in this Contract (if any). Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.05 *Delays in Contractor's Progress*

SC-4.05 Amend Paragraph 4.05.C by adding the following subparagraphs:

- 5. *Weather-Related Delays*
 - a. If "abnormal weather conditions" as set forth in Paragraph 4.05.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Contract Times, such request must be documented by data substantiating each of the

following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled.

- b. The existence of abnormal weather conditions will be determined on a month-by-month basis in accordance with the following:
 - 1) Every workday on which one or more of the following conditions exist will be considered a “bad weather day”:
 - i) Total precipitation (as rain equivalent) occurring between 7:00 p.m. on the preceding day (regardless of whether such preceding day is a workday) through 7:00 p.m. on the workday in question equals or exceeds average precipitation as rain equivalent for previous 5 years, as determined by National Weather Service.
 - 2) Determination of actual bad weather days during performance of the Work will be based on the weather records measured and recorded by **National Weather Service** weather monitoring station at **Brownsville, TX**.
 - 3) Contractor shall anticipate the number of foreseeable bad weather days per month.
 - 4) In each month, every bad weather day exceeding the number of foreseeable bad weather days will be considered as “abnormal weather conditions.” The existence of abnormal weather conditions will not relieve Contractor of the obligation to demonstrate and document that delays caused by abnormal weather are specific to the planned work activities or that such activities thus delayed were on Contractor’s then-current Progress Schedule’s critical path for the Project.

ARTICLE 5—SITE, SUBSURFACE AND PHYSICAL CONDITIONS, HAZARDOUS ENVIRONMENTAL CONDITIONS

SC 5.02 Remove wording from Paragraph 5.02 A.2 “or otherwise resolve the claim by arbitration or other dispute resolution proceeding.”

5.03 *Subsurface and Physical Conditions*

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.A:

- 1. *Required Performance Bond Form:* The performance bond that Contractor furnishes will be in the form of EJCDC® C-610, Performance Bond (2010, 2013, or 2018 edition).
- 2. *Required Payment Bond Form:* The payment bond that Contractor furnishes will be in the form of EJCDC® C-615, Payment Bond (2010, 2013, or 2018 edition).

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.B:

1. After Substantial Completion, Contractor shall furnish a warranty bond issued in the form of EJCDC® C-612, Warranty Bond (2018). The warranty bond must be in a bond amount of **15** percent of the final Contract Price.
2. The warranty bond must be issued by the same surety that issues the performance bond required under Paragraph 6.01.A of the General Conditions.

6.03 *Contractor's Insurance*

SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

- E. *Workers' Compensation and Employer's Liability:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance, including, as applicable, United States Longshoreman and Harbor Workers' Compensation Act, Jones Act, stop-gap employer's liability coverage for monopolistic states, and foreign voluntary workers' compensation (from available sources, notwithstanding the jurisdictional requirement of Paragraph 6.02.B of the General Conditions).

Workers' Compensation and Related Policies	Policy limits of not less than:
Workers' Compensation	
State	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Foreign voluntary workers' compensation (employer's responsibility coverage), if applicable	Statutory
Jones Act (if applicable)	
Bodily injury by accident—each accident	\$100,000.00
Bodily injury by disease—aggregate	\$500,000.00
Employer's Liability	
Each accident	\$100,000.00
Each employee	\$100,000.00
Policy limit	\$500,000.00
Stop-gap Liability Coverage	
For work performed in monopolistic states, stop-gap liability coverage must be endorsed to either the worker's compensation or commercial general liability policy with a minimum limit of:	\$500,000.00

- F. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against claims for:
1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees,
 2. damages insured by reasonably available personal injury liability coverage, and
 3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

- G. *Commercial General Liability—Form and Content:* Contractor’s commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage.
 - a. Such insurance must be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
 2. Blanket contractual liability coverage, including but not limited to coverage of Contractor’s contractual indemnity obligations in Paragraph 7.18.
 3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
 4. Underground, explosion, and collapse coverage.
 5. Personal injury coverage.
 6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.
 7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 “Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured” or its equivalent.
- H. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:
1. Any modification of the standard definition of “insured contract” (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).
 2. Any exclusion for water intrusion or water damage.
 3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.
 4. Any exclusion of coverage relating to earth subsidence or movement.
 5. Any exclusion for the insured’s vicarious liability, strict liability, or statutory liability (other than worker’s compensation).
 6. Any limitation or exclusion based on the nature of Contractor’s work.
 7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.

I. *Commercial General Liability—Minimum Policy Limits*

Commercial General Liability	Policy limits of not less than:
General Aggregate	\$500,000.00
Products—Completed Operations Aggregate	\$100,000.00
Personal and Advertising Injury	\$250,000.00
Bodily Injury and Property Damage—Each Occurrence	\$500,000.00

- J. *Automobile Liability*: Contractor shall purchase and maintain automobile liability insurance 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. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	Policy limits of not less than:
Bodily Injury	
Each Person	\$100,000.00
Each Accident	\$500,000.00
Property Damage	
Each Accident	\$100,000.00
[or]	
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage)	\$500,000.00

- K. *Umbrella or Excess Liability*: Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the Paragraphs above. The coverage afforded must be at least as broad as that of each and every one of the underlying policies.

Excess or Umbrella Liability	Policy limits of not less than:
Each Occurrence	\$250,000.00
General Aggregate	\$500,000.00

- L. *Using Umbrella or Excess Liability Insurance to Meet CGL and Other Policy Limit Requirements*: Contractor may meet the policy limits specified for employer's liability, commercial general liability, and automobile liability through the primary policies alone, or through combinations of the primary insurance policy's policy limits and partial attribution of the policy limits of an umbrella or excess liability policy that is at least as broad in coverage as that of the underlying policy, as specified herein. If such umbrella or excess liability policy was required under this Contract, at a specified minimum policy limit, such umbrella or excess policy must retain a minimum limit of **\$500,000.00** after accounting for partial attribution of its limits to underlying policies, as allowed above.
- M. *Contractor's Pollution Liability Insurance*: Contractor shall purchase and maintain a policy covering third-party injury and property damage, including cleanup costs, as a result of

pollution conditions arising from Contractor's operations and completed operations. This insurance must be maintained for no less than three years after final completion.

Contractor's Pollution Liability	Policy limits of not less than:
Each Occurrence/Claim	\$100,000.00
General Aggregate	\$100,000.00

- N. *Contractor's Professional Liability Insurance:* If Contractor will provide or furnish professional services under this *Contract*, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance must cover negligent acts, errors, or omissions in the performance of professional design or related services by the insured or others for whom the insured is legally liable. The insurance must be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. The retroactive date on the policy must pre-date the commencement of furnishing services on the Project.

Contractor's Professional Liability	Policy limits of not less than:
Each Claim	\$500,000.00
Annual Aggregate	\$1,000,000.00

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.03 Labor; Working Hours

SC-7.03 Add the following new subparagraphs immediately after Paragraph 7.03.C:

1. Regular working hours will be **Monday-Friday 8:00 am to 5:00 pm.**
2. Owner's legal holidays are **Federal recognized holidays.**

SC-7.03 Add the following new paragraph immediately after Paragraph 7.03.C:

- D. **Contractor** shall be responsible for the cost of any overtime pay or other expense incurred by the Owner for Engineer's services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular work day. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

7.13 Safety and Protection

SC-7.13 Insert the following at the end of the last sentence of Paragraph 7.13.F:

"with at least a 48-hour notice."

SC-7.18 Delete the following from Paragraph 7.18.A:

"or arbitration"

ARTICLE 8—OTHER WORK AT THE SITE

8.03 *Legal Relationships*

SC-8.03 Delete the following from Paragraph 8.03.C:

“or otherwise resolve the claim by arbitration or other dispute resolution proceeding”

ARTICLE 9—OWNER’S RESPONSIBILITIES

ARTICLE 10—ENGINEER’S STATUS DURING CONSTRUCTION

10.03 *Resident Project Representative*

SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.B:

- C. The Resident Project Representative (RPR) will be Engineer's representative at the Site. RPR's dealings in matters pertaining to the Work in general will be with Engineer and Contractor. RPR's dealings with Subcontractors will only be through or with the full knowledge or approval of Contractor. The RPR will:
 - 1. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings (but not including Contractor's safety meetings), and as appropriate prepare and circulate copies of minutes thereof.
 - 2. *Safety Compliance:* Comply with Site safety programs, as they apply to RPR, and if required to do so by such safety programs, receive safety training specifically related to RPR's own personal safety while at the Site.
 - 3. *Liaison*
 - a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.
 - c. Assist in obtaining from Owner additional details or information, when required for Contractor's proper execution of the Work.
 - 4. *Review of Work; Defective Work*
 - a. Conduct on-Site observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02, if the Work is in general proceeding in accordance with the Contract Documents.
 - b. Observe whether any Work in place appears to be defective.
 - c. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.

5. *Inspections and Tests*
 - a. Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to those performed by public or other agencies having jurisdiction over the Work.
 - b. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.
 6. *Payment Requests: Review Applications for Payment with Contractor.*
 7. *Completion*
 - a. Participate in Engineer's visits regarding Substantial Completion.
 - b. Assist in the preparation of a punch list of items to be completed or corrected.
 - c. Participate in Engineer's visit to the Site in the company of Owner and Contractor regarding completion of the Work, and prepare a final punch list of items to be completed or corrected by Contractor.
 - d. Observe whether items on the final punch list have been completed or corrected.
- D. The RPR will not:
1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).
 2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.
 3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
 4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction.
 5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
 6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.
 7. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 11—CHANGES TO THE CONTRACT

No suggested Supplementary Conditions in this Article.

ARTICLE 12—CLAIMS

No suggested Supplementary Conditions in this Article.

ARTICLE 13—COST OF WORK; ALLOWANCES, UNIT PRICE WORK

13.01 *Cost of the Work*

SC-13.01 Supplement Paragraph 13.01.B.5.c.(2) by adding the following sentence:

The equipment rental rate book that governs the included costs for the rental of machinery and equipment owned by Contractor (or a related entity) under the Cost of the Work provisions of this Contract is the most current edition of **Rental Rate Blue Book for Construction Equipment**.

13.03 *Unit Price Work*

SC-13.03 Delete Paragraph 13.03.E in its entirety and insert the following in its place:

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
 - a. the extended price of a particular item of Unit Price Work amounts to **5** percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than **15** percent from the estimated quantity of such item indicated in the Agreement; and
 - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

No suggested Supplementary Conditions in this Article.

ARTICLE 15—PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

15.03 *Substantial Completion*

SC-15.03 Add the following new subparagraph to Paragraph 15.03.B:

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, will be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under this Article 15.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

No suggested Supplementary Conditions in this Article.

ARTICLE 17—FINAL RESOLUTIONS OF DISPUTES

SC-17.02 Add the following new paragraph immediately after Paragraph 17.01.

17.02 *Arbitration*

- A. Arbitration as a dispute resolution is deleted in its entirety in the contract, general and supplementary conditions.

ARTICLE 18—MISCELLANEOUS

Document 00811

FEDERAL WAGE RATE DECISION

1.01 In accordance with the Davis-Bacon Act (Public Law No. 403, 7th Congress), the public body awarding this Contract does hereby specify the following to be assigned minimum wage rates which will be paid by the Contractor and all Subcontractors for this Project.

1.02 This prevailing wage rate does not prohibit the payment of more than the rates stated.

1.03 The wage scale for (Specify type of work).

Note to Specifier: Davis-Bacon Wage Rates can be found at <http://www.wdol.gov/dba.aspx>. Use the Wage Rates for Hidalgo County. Select the WD Determination that is appropriate for the Project Copy the Wage Rate directly from the DOL website to this Section.

SECTION 00830

WARRANTY

PART 1 - GENERAL**1.01 SECTION INCLUDES**

This section describes the warranty. The conditions contained in this Section are specific administrative and policy requirements in addition to the general conditions and other requirements listed in the contract documents.

1.02 REFERENCES – Not Used**1.03 DEFINITIONS – Section 0700****1.04 CONTRACTOR'S WARRANTY OF TITLE**

CONTRACTOR warrants and guarantees that 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.

1.05 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. Promptly thereafter, 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 therefore. If ENGINEER considers the Work substantially complete, ENGINEER will prepare and 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 therefore. 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. 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.
- B. OWNER shall have the right to exclude CONTRACTOR from the Site after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

1.06 PARTIAL UTILIZATION

- A. Use by OWNER at OWNER's option of 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, may be accomplished prior to Substantial Completion of all the Work subject to the following conditions.
- B. OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and substantially complete. If 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. 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. 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 therefore. If ENGINEER considers that part of the Work to be substantially complete, the above provisions 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. No occupancy or separate operation of part of the Work may occur prior to compliance with the requirement of regarding property insurance.

1.07 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.

1.08 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: (i) all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required; (ii) consent of the surety, if any, to final payment; and (iii) 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 above 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. Review of Application and Acceptance

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 above provisions. 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

Thirty days after the presentation to OWNER of the Application for Payment and accompanying documentation, the amount recommended by ENGINEER will become due and, when due, will be paid by OWNER to CONTRACTOR.

D. Final Completion Delayed

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 and recommendation of ENGINEER, and without terminating the Agreement, 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 above, 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.

1.09 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 the above, 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 writing which are still unsettled.

END OF SECTION

Document 00900

ADDENDUM NO. _____
(Sample Form)

Date of Addendum: _____
[Enter date]

PROJECT NAME: Replacement of Los Venados Standpipe

PROJECT NO: Project 2019-82

BID DATE:_____. (There is no change to the Bid Date.)

FROM: City of Edinburg
Att: Lorena Fuentes, Purchasing Agent
415 W. University Drive
Edinburg, Texas 78539
Phone: (956) 388-1895

TO: Prospective Bidders

This Addendum forms a part of the Bidding Documents and will be incorporated into Contract Documents, as applicable. Insofar as the original Project Manual and Drawings are inconsistent, this Addendum governs. Acknowledge receipt of the Addendum by inserting its number in Document 00310 - Form of Proposal. **FAILURE TO DO SO MAY SUBJECT BIDDER TO DISQUALIFICATION.**

Use the following heading and select the appropriate wording for postponement of the Bid Date. Delete the statement beside Bid Date above which indicates that the Bid Date is unchanged. If change in Bid Date, issue as separate addendum. Delete this section entirely if there is no change in Bid Date.

CHANGE IN BID DATE

The bid date for this Project has been changed from _____ to _____
[Date] [Date]
[Time of day and place for submittal of bid remains the same]. [Time of submittal has been changed
from _____ to _____. The place for submittal remains the same].
[Time] [Time]

[OR]

The bid date for this project has been indefinitely postponed. Another Addendum will be issued to reset the bid date or to cancel bidding on this Project.

Delete the following paragraph if the sole purpose of the Addendum is to postpone the Bid Date.

This Addendum uses the change page method: remove and replace or add pages, or Drawing sheets, as directed in the change instructions below. Change bars (|) are provided in the right margins of pages from the Project Manual to indicate where changes have been made; no change bars are provided in added Sections. Reissued Drawing Sheets show the Addendum number above the title block and changes in the Drawing are noted by a revision mark.

Number each item of the Addendum beginning with 1 through the total number of change items in the Addendum. Sample entries are provided in brackets.

CHANGES TO PREVIOUS ADDENDA

Reference Addendum Number and item number to correct clarifications or make minor corrections of changes issued by previous Addenda.

ADDENDUM NO. _____

[1. Add item]

CHANGES TO PROJECT MANUAL

Follow this format to sequence changes to the Project Manual.

BIDDING REQUIREMENTS

Give the individual change instructions for each item of change by Document number and title. List changes in order of Document number.

[2. Add Item]

CONTRACT FORMS

[3. Add Item]

CONDITIONS OF THE CONTRACT

[4. Add Item]

SPECIFICATIONS

[5. Add Item]

CHANGES TO DRAWINGS

[6. Add Item]

CLARIFICATIONS

[7. Add Item]

MINUTES OF PRE-BID CONFERENCE

Minutes of the Pre-Bid Conference held on _____, _____, 20____, are
[Day] [Date]
attached as a record and for the Bidders information.

END OF ADDENDUM NO. _____

Name, P.E. DATED: _____

END OF DOCUMENT

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DOCUMENT 00910

MODIFICATIONS**PART 1 - GENERAL****1.01 SECTION INCLUDES**

This section contains information pertaining to modifications and changes for the Contract Documents for the Project.

1.02 REFERENCES – Not Used**1.03 DEFINITIONS - Section 0700****1.04 MODIFICATIONS OF 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 in one or more of the following ways: (i) a Written Amendment; (ii) a Change Order; or (iii) 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: (i) a Field Order; (ii) Engineer's approval of a Shop Drawing or Sample; or (iii) Engineer's written interpretation or clarification.
- C. Contractor and any Subcontractor or Supplier or other individual or entity performing or furnishing any of the Work under a direct or indirect contract with Owner: (i) shall not 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 Consultant, including electronic media editions; and (ii) shall not 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 adoption by Engineer. This prohibition will survive final payment, completion, and acceptance of the Work, or termination or completion of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

PART 2 - PRODUCT – Not Used**PART 3 - EXECUTION – Not Used****END OF SECTION**

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HINOJOSA ENGINEERING, INC.

Civil Engineering • Structural Engineering
108 West 18th Street Mission, Texas 78572
(956) 581-0143 Fax (956) 581-2074
Registration Number F-908 Expiration Date 09/30/2019

TECHNICAL SPECIFICATIONS

CITY OF EDINBURG – REPLACEMENT OF LOS VENADOS STANDPIPE

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01010	SUMMARY OF WORK
SECTION 01060	REGULATORY REQUIREMENTS
SECTION 01152	APPLICATIONS FOR PAYMENT
SECTION 01153	CHANGE ORDER PROCEDURES
SECTION 01200	PROJECT MEETINGS
SECTION 01300	SUBMITTALS AND SUBSTITUTIONS
SECTION 01310	CONSTRUCTION SCHEDULE
SECTION 01320	DAILY CONSTRUCTION PROGRESS REPORT
SECTION 01380	CONSTRUCTION PHOTOGRAPHS
SECTION 01400	TESTING LABORATORY SERVICES
SECTION 01530	BARRIERS
SECTION 01700	CONTRACT CLOSEOUT
SECTION 01710	CLEANING
SECTION 01720	PROJECT RECORD DOCUMENTS
SECTION 01730	OPERATING AND MAINTENANCE DATA
SECTION 01740	WARRANTIES AND BONDS
SECTION 01 57 13	TEMPORARY EROSION AND SEDIMENT CONTROL
SECTION 01 73 29	CUTTING AND PATCHING

DIVISION 2 - EXISTING CONDITIONS

SECTION 02220	DEMOLITION
SECTION 02 41 19	SELECTIVE SITE DEMOLITION

DIVISION 3 - CONCRETE

SECTION 03 10 00	CONCRETE FORMING & ACCESSORIES
SECTION 03 20 00	CONCRETE REINFORCING
SECTION 03 30 00	CAST IN PLACE CONCRTE
SECTION 03 39 00	CONCRETE CURING

DIVISION 5 - METALS

SECTION 05 12 00	STRUCTURAL STEEL
SECTION 05 50 00	MISCELLANEOUS METALS

DIVISION 22- PLUMBING

SECTION 22 12 19	FACILITY GROUND- MOUNTED, POTABLE-WATER STORAGE TANKS
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DIVISION 31- EARTHWORK

SECTION 31 00 00	EATHWORK
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Registration Number F-908 Expiration Date 09/30/2019

SECTION 31 10 00	SITE CLEARING
SECTION 31 11 00	CLEARING AND GRUBBING
SECTION 31 14 11	EARTHWORK AND RELATED WORK
SECTION 31 23 00	EXCAVATION AND FILL
SECTION 31 23 16	EXCAVATION
SECTION 31 31 16	TERMITE CONTROL

DIVISION 32 EXTERIOR IMPROVEMENTS

SECTION 32 11 00	BASE COURSES
SECTION 32 13 13	CONCRETE PAVING
SECTION 32 16 12.01	SURFACE PREPARATION

DIVISION 34 TRANSPORTATION

SECTION 34 41 16	TRAFFIC CONTROL EQUIPMENT
------------------	---------------------------

TCEQ

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY WATER
DISTRIBUTION SYSTEM GENERAL CONSTRUCTION NOTES

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY WATER
STORAGE TANK GENERAL CONSTRUCTION NOTES



6-05-19

SECTION 01010

SUMMARY OF WORK

Part 1 GENERAL

1.01 GENERAL:

- A. Drawings and General Provision of Contract, including General and the Supplementary Requirements and applicable portions of Division 1 are part of this Special Conditions, Supplementary Conditions and Division 01 Specification Sections, apply to this section.

1.02 WORK UNDER THIS CONTRACT:

- A. The Work covered under this Contract shall consist of all excavation, foundation construction, backfill, construction access roadway construction, fabrication, erection, painting, disinfection, site clean-up and rough grading shown on the plans and specified in these Specifications for fabrication and erection of a 132,000 gallon (Standpipe) water storage tank system including foundation piping (utilities to and from standpipe), painting, and accessories. The above description shall serve as general information only and shall not be constructed to limit the contractor's responsibility or obligation to comply with the Contract Documents and Detailed Technical Specifications.

1.03 ADDITIONAL INSURED:

- A. The CONTRACTOR shall list City of Edinburg and Hinojosa Engineering, Inc., and each of their officers, agents, and employees as additional insured on all insurance policies (except worker's compensation and employers' liability) and coverage which are required by the OWNER as specified in the Contract Documents.

Part 2 PRODUCTS

- A. All products incorporated into the work area shall be new, unused, and first quality unless otherwise specifically noted.

Part 3 EXECUTION

3.01 QUALITY OF WORK:

- A. All work shall be performed in a workmanlike manner by properly trained and qualified personnel under supervision of the CONTRACTOR'S Representative.

END OF SECTION 01060

SECTION 01060**REGULATORY REQUIREMENTS****Part 1 GENERAL****1.01 REGULATORY REQUIREMENTS:**

- A. All public works construction within the City of Edinburg and its ETJ shall be performed in accordance with the requirements of these specifications.
- B. It shall be the responsibility of the CONTRACTOR to familiarize himself/herself fully regarding the detailed needs and requirements of any and all regulatory agencies having jurisdiction over this work.
- C. Confirmed Space Entry: The CONTRACTOR shall comply with and have documented Confined Entry Space Procedures available at the standpipe site at all times as required by OSHA 29 CFR 1926 Subpart AA. The CONTRACTOR shall also comply with any state and/or local requirements which are more restrictive than federal requirements.
- D. Compliance with Environmental Regulations: Compliance with local, state and federal regulations concerning emissions or disposal of solid, particulate, liquid, or gaseous matter as a result of the cleaning, painting, or other operations under this Agreement shall be the responsibility of the CONTRACTOR. This compliance shall be accomplished without supervision from the OWNER, HINOJOSA ENGINEERING, INC. or other direct or indirect agents of the OWNER.
- E. Safety and Health: The CONTRACTOR shall comply with safe working practices for abrasive blasting, cleaning, burning, welding, and handling lead-based and nonlead-based coated steel, and all safety regulations and requirements of Federal, state and local health regulatory agencies, Material Safety Data Sheets (MSDS), and the paint and abrasive manufacturers. This compliance shall be accomplished without supervision from the OWNER, HINOJOSA ENGINEERING, INC., FIELD OBSERVER, or other direct or indirect agents of the OWNER.
- F. Rigging Attachments: All rigging attachments installed on the standpipe (by the erection or painting CONTRACTOR) shall be carefully inspected by the CONTRACTOR immediately prior to use. The CONTRACTOR assumes all responsibility for use of any added attachments.

1.02 REQUIREMENTS:

- A. Notice before Beginning Work:
 - a) The contractor shall notify the City of Edinburg at least 24 hours before beginning any construction. If for any reason work should stop on a project during any stage of construction for a period of more than forty eight (48) hours, it shall be the responsibility of the contractor to notify the City of Edinburg forty eight (48) hours to any resumption of work on the project. The contractor may work extended shifts, double shifts, or hours other than the normal workday of City of Edinburg personnel only with written permission from the City except in the event of an emergency.
 - b) When City or Hinojosa Engineering, Inc. inspectors are required to work overtime, it shall be at the contractor's expense.
- B. Provide required personnel, equipment, and materials, to construct project according to applicable codes and standards.

1.03 APPLICABLE CODES AND STANDARDS:

- A. All design and work shall be in accordance with the local building code and requirements. As a minimum standard of quality and workmanship, construction Work is to comply with at latest edition of the following codes and standards insofar as they are applicable:
1. American Water Works Association (AWWA) Standards
 2. American Welding Society (AWS) Standards
 3. American Petroleum Institute (API) Standards
 4. American Institute of Steel Construction (AISC)
 5. American Society for Testing and Materials (ASTM) Standards
 6. American Concrete Institute (ACI) Standards
 7. Concrete Reinforcing Steel Institute (CRSI) Standards
 8. SSPC: The Society for Protective Coatings (SSPC) Standards *{formerly Steel Structures Painting Council}*
 9. Occupational Safety and Health Administration (OSHA) Standards
 10. American National Standards Institute (ANSI) Standards
 11. United States Environmental Protection Agency (USEPA)
 12. United States Resource Conservation and Recovery Act (US RCRA)
 13. National Electric Code (NEC)
 14. NSF International (NSF) {Formerly National Sanitation Foundation}
 15. Underwriter's Laboratories (UL)
 16. American Society of Civil Engineers (ASCE)
 17. Texas Commission on Environmental Quality (TCEQ)
 18. International Building Code (IBC)
- B. The above codes and standards are hereinafter referred to as "Reference Specifications"

Part 2 PRODUCTS

NOT USED

Part 3 EXECUTION**3.01 PROCEDURES:**

- A. CONTRACTOR shall comply with all regulations and requirements listed by this Section. CONTRACTOR shall pay all fees, obtain necessary permits as may be required for the performance of this work.

END OF SECTION 01060

SECTION 01152

APPLICATION FOR PAYMENT

PART 1: GENERAL:

1.01 GENERAL:

- A. Submit Applications for Payment to **Engineer** for each site in accordance with the schedule established by Conditions of the Contract and Agreement between Owner and Contractor.
- B. Submit itemized applications typed on A1A DOCUMENT G702, Application and Certificate for Payment, and continuation sheets G703. To purchase original forms call the LRGV/AIA office at 956-994-0939.
- C. *Application for payment shall also be accompanied by a written notarized statement from the surety confirming that the surety has reviewed the application for payment and approves, without reservation, of its payment by the Owner.***

1.02 PREPARATION OF APPLICATION:

- A. Application Form:
 - 1. Fill in required information, including that for Change Orders executed prior to the date of submittal of application.
 - 2. Fill in summary of dollar values to agree with the respective totals indicated on the continuation sheets.
 - 3. Indicate percentage of retainage for completed work and for stored materials as agreed upon in the Owner-Contractor Agreement.
 - 4. Execute notarized certification with the signature of a responsible officer of the Contract firm.
- B. Continuation Sheets:
 - 1. Fill in total list of all scheduled component items of Work, with item number and the scheduled dollar value for each item.
 - 2. Fill in the dollar value in each column for each scheduled line item when work has been performed or products presently stored.
 - a. Round off values to nearest dollar, or as specified for the Schedule of Values.
 - 3. List each Change Order executed prior to the date of submission, at the end of the continuation sheets unless otherwise agreed upon.
 - a. List each Change Order Number, and description, as for an original component item of work unless it is agreed that the schedule of values should be revised.
- C. Construction Schedule:
 - A. Provide original construction schedule with first application for payment.
 - B. With subsequent applications provide updated construction schedule indicating deviations from original construction schedule.

1.03 SUBMITTAL PROCEDURE:

- A. Submit three {3} copies of Applications for Payment to **Engineer** at the times stipulated in the Agreement.
- B. When **Engineer** finds the Application properly completed and correct, he will transmit a certificate of payment to Owner. If an adjustment in the requested amount is made, he will advise the Contractor in writing.

END OF SECTION 01152

SECTION 01153
CHANGE ORDER PROCEDURES

PART 1: GENERAL:**1.01 PROPOSED CHANGES:**

- A. Upon discovery of circumstances or conditions leading to the conclusion that a construction change should be made, the **Engineer** will issue a Request for Change Order Proposal (R.F.P.) form.
- B. Any work done by Contractor not authorized by the Owner shall be subject to removal at the Contractor's expense.
- C. Upon determination that a proposed change appears feasible, the **Engineer** will assign a R.F.P. number and log the information. The **Engineer** will then prepare necessary drawings, specifications or descriptions as required for pricing.
- D. The **Engineer** will forward the package to the Contractor for pricing. Typically, ten (10) working days will be allowed for pricing; however, additional time will be allowed for more extensive changes.
- E. **The Contractor shall submit his price proposal along with all required back-up information to the **Engineer**. The submittal shall include separate breakdowns for general contract and subcontract work.**
- F. **The breakdowns shall show materials by quantities and unit prices. Cost including labor, tax, insurance mark-ups, and equipment costs. Overhead and profit shall be shown separately. Quotation shall include all costs. No additional costs will be allowed for a proposed change.**
- G. The Contractor's proposed change quotations will be reviewed by the **Engineer** within a reasonable amount of time, usually not more than ten (10) working days. Conformance with the contract and the proposed change documents, as well as material, labor and equipment quantities and costs, and allowed mark-up percentages will be verified. Requests for additional time will also be evaluated based on the contractor's written evidence submitted along with a revised construction schedule proving impact on final completion date. Lack of such written evidence shall cause the request for time extension to be rejected. In case of differences, discrepancies, errors, etc. the Contractor will take action to obtain necessary revisions or corrections to the quotation.
- H. "Cost of Doing business" items such as, but not limited to, supervision, field and home office expenses, warranty reserve, clean-up, and expendable supplies are a part of the overhead expense and as such shall not be included as a part of the change order proposal.
- I. Bond premiums may be included as an expense item in an additive R.F.P. if also included in a deductive R.F.P. Percentage allowed shall be limited to actual percentage paid by General Contractor to bonding agent. Premiums for subcontractor bonds, if required by General Contractor, shall not be passed on the Owner.
- J. When a price quotation has been considered acceptable, the **Engineer** will forward his recommendations and all back-up information to the Owner. A recommendation either for or against the proposed change will accompany this submittal from the **Engineer**.

1.02 AUTHORIZATION FOR CONSTRUCTION TO PROCEED:

- A. Within a reasonable time, the Owner will notify the **Engineer** whether the change will be implemented. If the change is approved, the **Engineer** will issue a Change Order. The Change

Order may be issued, at the **Engineer's** discretion, immediately or in conjunction with several other approved RFP's if considered appropriate.

END OF SECTION 01153

SECTION 01200

PROJECT MEETINGS

PART 1: GENERAL:

1.01 DESCRIPTION:

- A. Contractor shall schedule and administrate pre-construction meeting, **weekly** progress meetings, and specially called meetings throughout the progress of the work.
 - 1. Prepare agenda for meetings.
 - 2. Distribute written notice of each meeting and the agenda four (4) working days in advance of meeting date.
 - 3. Make physical arrangements for meetings.
 - 4. Preside at meetings.
 - 5. Record the minutes; include all significant proceedings and decisions.
 - 6. Reproduce and distribute copies of minutes within three (3) working days after each meeting.
- B. Representative of contractors, subcontractors and suppliers attending the meetings shall be qualified and authorized to act on behalf of the entity each represents.
- C. **Engineer's** and Owner's Representative may attend meetings

1.02 PRE-CONSTRUCTION MEETING:

- A. Schedule within fifteen (15) days after date of Notice to Proceed.
- B. Location: **To be determined by owner.**
- C. Attendance:
 - 1. Owner's Representative.
 - 2. **Engineers** and his professional consultants.
 - 3. Contractor's Superintendent.
 - 4. Major Subcontractors.
 - 5. Others as appropriate.

1.03 PROGRESS MEETINGS:

- A. Schedule regular **Weekly** meetings at **a scheduled time** on an agreed upon date of each month.
- B. Hold called meetings as required by progress of the Work.
- C. Location of the meetings: on site or designated meeting place.
- D. Attendance:

1. **Engineer** and his professional consultants as needed.
2. Subcontractors as appropriate to the agenda.
3. Suppliers as appropriate to the agenda.
4. Others as appropriate.

END OF SECTION 01200

SECTION 01300**SUBMITTALS AND SUBSTITUTIONS****PART 1: GENERAL:****1.01 DESCRIPTION:****A. Work Included:**

1. Wherever possible throughout the Contract Documents, the minimum acceptable quantity of workmanship and materials has been defined by manufacturer's name and catalog numbers, reference to recognized industry and government standards, or description of required attributes and performance.
2. To ensure that the specified products are furnished and installed in accordance with design intent, procedures have been established for advance submittal of design data and for their review by the **Engineer**.
3. Make all submittals required by the Contract Documents, and revise and resubmit as necessary to establish compliance with the specified requirements. Submittals should include cut sheets of original specified items.
4. Product substitution request shall be submitted no later than 7 days prior to opening of Bids (Proposals)

B. Related Work Described Elsewhere: Individual requirements for submittals are described in pertinent order Section of these Specifications.**10.2 QUALITY ASSURANCE:****A. Coordination of Submittals:** Prior to each submittal, carefully review and coordinate all aspects of each item being submitted and verify that each item and the submittal for it conforms in all respects with the requirements of the Contract Documents. By affixing the Contractor's signature to each submittal, Contractor certifies that this coordination has been performed. Contractor shall approve all submittals prior to submission to **Engineer**. Contractor shall verify all dimensions and conditions on the job.**B. Certificate of Compliance:**

1. Certify that all materials used in the work comply with all specified provisions thereof. Certification shall not be construed as relieving the Contractor from furnishing satisfactory materials if, after tests are performed on selected samples, the material is found to not meet specified requirements.
2. Show on each certification the name and location of the work, name and address of Contractor, quantity and date or dates of shipment or delivery to which the certificate applies, and name of the manufacturing or fabricating company. Certification shall be in the form of letter or company-standard forms containing all required data. Certificates shall be signed by an officer of the manufacturing or fabricating company.
3. In addition to the above information, all laboratory test reports submitted with Certificates of Compliance shall show the date or dates of testing, the specified requirements for which testing was performed, and results of the test or tests.

1.03 SUBMITTALS:**A. Submittals Schedule:** Provide submittal schedule with first Application for Payment, and before any items are submitted for approval, submit to the **Engineer** two copies of the schedule described in Article 2.01 of this Section.

- B. Certification of Compliance: Upon completion of the Work, and as a condition of its acceptance, submit to the **Engineer** all Certificates of Compliance.
- C. Procedures: Make submittals in strict accordance with the provisions of this Section.

PART 2: PRODUCTS:

2.01 SUBMITTAL SCHEDULE:

- A. General: Compile a complete and comprehensive schedule of all submittals anticipated to be made during progress of the work. Include a list of each type of item for which Contractor's drawings, shop drawings, Certificates of Compliance, material samples, guarantees, or other types of submittals are required. Upon approval by the **Engineer** this schedule will become part of the Contract and the Contractor will be required to adhere to the schedule except when specifically otherwise permitted. **Submittals will not be processed & reviewed until schedule is received.**
- B. Coordination: Coordinate the schedule with all subcontractors and materials suppliers to ensure their understanding of the importance of adhering to the approved schedule. Coordinate as required to ensure the grouping of submittals as described in Paragraph 3.02 below.
- C. Revisions: Revise and update the schedule on a **weekly** basis as necessary to reflect conditions and sequences. Promptly submit revised schedule to the **Engineer** for review and comment with each application for payment.
- D. It is the Contractor's responsibility to notify the **Engineer** in writing if and when the submittal not returned from review are going to impact the construction schedule.

2.02 SHOP DRAWINGS AND COORDINATION DRAWINGS:

- A. Shop Drawings:
 - 1. Scale and Measurements: Make all shop drawings accurately to a scale sufficiently large to show all pertinent aspects of the items and its method of connection to the work (construction document drawings shall not be traced, copied or reproduced).
 - 2. Type of Prints Required: Submit two printed copies and one reproducible (vellum) of each submittal.
 - 3. Review of Shop Drawings: All review comments of the **Engineer** will be shown on the reproducible drawings when it is returned to the Contractor. The Contractor shall be responsible for making all copies required for his purpose and distributing them to the subcontractors & suppliers.
 - 4. Failure to submit one printed & one reproducible copy will cause the submittal to be returned unchecked.

2.03 MANUFACTURERS' LITERATURE:

- A. General: Where contents of submitted literature from manufacturers includes data not pertinent to the submittal, **clearly indicate which portion of the contents is being submitted for review. Highlight pertinent information with green highlighter.**
- B. Number of Copies Required: ***Submit number required by the general contractor for construction plus one copy for engineer, one copy for consultants, one copy for owner.*** General contractor copies will be returned to the contractor with all review comments of the architect and respective consultant.

2.04 SAMPLES:

- A. Accuracy of Samples: Samples shall be of the precise article proposed to be furnished.
- B. Number of Samples Required: Unless otherwise specified, submit all samples in the quantity which is required to be returned plus two (2) which will be retained by the **Engineer**.
- C. Reuse of Samples: In situations specifically so approved by the **Engineer**, the **Engineer's** retained sample may be used in the construction as one of the installed items.

2.05 COLORS AND PATTERNS:

- A. Unless the precise color and pattern is specifically described in the Contract Documents, and whenever a choice of color pattern is available in a specified product, submit accurate color and pattern charts to the **Engineer** for review and selection.

2.06 SUBSTITUTIONS:

- A. Approval Required:
 - 1. The Contract is based on the standards of quality established in the Contract Documents.
 - 2. All products proposed for use, including those specified by required attributes and performance, shall require approval by the **Engineer** before being incorporated into the work.
 - 3. Do not substitute materials, equipment, or methods unless such substitution has been specifically approved for this work by the **Engineer**.
 - 4. Product substitution requests shall be submitted no later than 7 days prior to Opening of Bids (Proposals) as noted in Section 00020.
- B. "Or Equal":
 - 1. Where the phrase "or equal" or "or equal as approved by the **Engineer**" occurs in the Contract Documents, do not assume that materials, equipment, or methods will be approved as equal unless the item has been specifically approved for this work by the **Engineer**.
 - 2. The decision of the **Engineer** will be final.
 - 3. It is the Contractor's responsibility to compare all aspects of the substitute and prove the substitute is equal.
 - 4. Coordinate submission of submittals with the different submittals related to the parts of Work so that the submittal will proceed according to the submittal schedule.
 - 5. Processing of submittal which contain finishes for selection will not begin until all related submittals are received.

2.07 DEVIATIONS:

- A. Clearly note, in written form, any deviations from the contract documents.

2.08 COMPLIANCE:

- A. Clearly mark specific items which are submitted in compliance with the contract documents.

PART 3: EXECUTION:**3.01 IDENTIFICATION OF SUBMITTALS:**

- A. General: Identify each submittal with specification section number and project name. Accompany each submittal with a letter of transmittal containing all pertinent information required for identification and check of submittals.

- B. Internal Identification: On at least the first page of each copy of each submittal, and elsewhere as required for positive identification, clearly indicate the submittal specification section number in which the item was included.
- C. Resubmittals: When material is resubmitted for any reason, transmit under a "REVISED" letter of transmittal and with a "REVISED" submittal specification section number. (e.g.: 03100 becomes 03100R-1)
- D. Submittal Log: Maintain an accurate submittal log for the duration of the Contract, showing current status of all submittals at all times. Make the submittal log available for the Engineer's review upon request.

3.02 COORDINATION OF SUBMITTALS:

- A. Coordinate, prepare, and process submittals in accordance with work; to be performed.
- B. General: Prior to submittal for approval, use all means necessary to fully coordinate all materials and work task activities including, but not necessarily limited to:
 - 1. Determine and verify all conditions, catalog numbers, and similar data.
 - 2. Coordinate with other trades as required.
 - 3. Clearly indicate all deviations from requirements of the Contract Documents.
- C. Grouping of Submittals: Unless otherwise specified, make all submittals in groups containing all associated items to ensure that information is available for checking each item when it is received. Partial submittals may be rejected as not complying with the provisions of the Contract Documents and the Contractor shall be strictly liable for all delays so occasioned.

3.03 SUBMITTAL SCHEDULE:

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmitted, ordering, manufacturing, fabrication, and delivery when establishing dates.
 - 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
 - 2. Material Submittal: Submit all material submittals required to maintain orderly progress of the Work and those required early because of long lead-time for manufacture or fabrication or for final color selection.

3.04 TIMING OF SUBMITTALS:

- A. General: Make all submittals far enough in advance of scheduled dates for installation to provide all time required for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery. Allow time for the above tasks in construction submittal schedule.
- B. Submittal time schedules: Submittals shall be provided to engineer for project based on:

3 month to 6 month projected completion 1 month from date of contract for items requiring color selection and 2 months for other items.

7 month to 12 month projected completion 2 months from date of contract for items requiring color selection and 3 months for other items.

13 month to 16 month projected completion 3 months from date of contract for items requiring color selection and months for other items.

over 17 months projected completion 4 months from date of contract for items requiring color selection and 5 months for other items.

- C. **Engineer's** Initial Review Time: In scheduling, allow at least fifteen (15) working days for initial review by the **Engineer** following receipt of the submittal. Items requiring color coordination will be delayed pending receipt of all items that require color coordination and owner approval.
- D. Consultant's review time: In scheduling allow at least (20) work days for initial review of each submittals.
- E. Delays: Delays caused by tardiness in receipt of submittals will not be an acceptable basis for extension of the Contract completion date.

3.05 ENGINEER'S REVIEW:

- A. General: Review by the **Engineer** shall not be construed as a complete check, but only that the general method of construction and detailing is satisfactory. Review shall not relieve the Contractor from responsibility for errors which may exist.
- B. Authority to Proceed: The notations "**no exception taken**" or "**make corrections noted**" authorize the Contractor to proceed with fabrication, purchase, or both, of the items so noted, subject to the revisions, if any, required by the Architect's review comments.
- C. Revisions: Make all revisions required by the **Engineer**. If the Contractor considers any required revision to be a change, he shall so notify the **Engineer** as provided for under "Changes" in the General Conditions before proceeding with the work. Show each drawing revision by number, date, and subject in a revision block on the drawing. Make only those revisions directed or approved by **Engineer**.
- D. Revisions after Approval: When a submittal has been reviewed by the **Engineer**, resubmittal for substitution of materials, or equipment, will not be considered.

END OF SECTION 01300

SECTION 01310

CONSTRUCTION SCHEDULE

PART 1: GENERAL:

1.01 CONSTRUCTION SCHEDULE:

- A. The Contractor shall, within **ten (10)** working days after Notice to Proceed, prepare and submit to the Owner and **Engineer** for approval, a practicable Work Schedule, showing the order in which the Contractor proposes to carry on the Work and the time at which the several milestone features will be started and completed.
- B. The Contractor shall incorporate into this analysis that work being performed by each subcontractor so that all work involved is shown in the schedule for the complete project.
- C. Activities shown on the schedule shall consist not only of the actual construction operations, but will include also the submittal of shop drawings and samples, procurement of materials and equipment and installation and testing of major and critical items.
- D. Activities of the Owner that affect the progress, such as approvals and the deliveries of Owner-furnished materials shall also be shown.
- E. Related activities shall be grouped on the schedule for simplification. The selection of activities will be subject to approval by the Owner and **Engineer**.
- F. For each activity there shall be listed an earliest and latest start time, the earliest and latest finish time and the slack time.
- G. During progress of the work, any changes in the original schedule desired by the Contractor must be approved by the Owner and **Engineer** before being put into effect.
- H. When changes in the work are required and directed by the Owner and **Engineer** under applicable paragraphs of this Contract, the original schedule may if required, be revised without delay to incorporate such changes, or new work, and indicate the effect, if any, thereof on the Project as a whole. The cost of such schedule change shall be considered as part of the overhead cost of revised work.
- I. If the Contractor falls behind the original Schedule, the Contractor shall take such steps as may be necessary to improve the progress, which may require the contractor to increase the number of shifts, and/or overtime operation, days of work and/or the amount of construction plant, and to submit for approval revised schedules in the form above in order to demonstrate the manner in which the agreed rate of progress will be regained, all without additional cost to the Owner.

END OF SECTION 01310

SECTION 01320

DAILY CONSTRUCTION PROGRESS REPORT

PART 1: GENERAL:

1.01 GENERAL:

- A. The Contractor shall submit to the **Engineer** upon request, Daily Reports, wherein the following data is provided relative to his work and the Work of his Subcontractors:
1. Location and description of work being performed.
 2. Problems, if any, encountered during the course of the day's work.
 3. Number of personnel on job for Contractor and each Subcontractor (broken down as to the number of journeymen, apprentices, etc.).
 4. Temperature and weather conditions.
 5. Report of any accident or accidents that may have occurred during the reporting period.
 6. General description of delivery of material to be stored on site.

END OF SECTION 01320

SECTION 01380

CONSTRUCTION PHOTOGRAPHS

PART 1: GENERAL:

1.01 CONSTRUCTION PHOTOGRAPHS:

- A. Construction progress photographs shall be taken once a **day** with the time, direction of view and vantage points noted, **and submit to engineer at weekly construction meeting.**
- B. Photograph from locations to adequately illustrate the condition of construction and the state of the Project.
 - 1. At successive periods of construction, take at least one photograph from the same overall view as previously and other locations to demonstrate the daily activity of construction please submit photos in electronic format in form of DVD.

END OF SECTION 01380

SECTION 01400

TESTING LABORATORY SERVICES

PART 1: GENERAL:

1.01 DESCRIPTION:

- A. Work Included: Testing includes, but is not necessarily limited to:
 - 1. Soil Compaction
 - 2. Concrete
 - 3. Grout
 - 4. Mortar
- B. Related Work Described Elsewhere: Requirements for testing may be described in various specification sections.
- C. Testing Laboratory: The Testing Laboratory will be selected & paid by the **Owner**.

1.02 QUALITY ASSURANCE:

- A. Qualifications of testing laboratory: The laboratory will be qualified in accordance with ASTM E-329-70 "Recommended Practice for Inspection and Testing Agencies for Concrete and Steel Used in Construction".
- B. Codes and Standards: (Testing) In accordance with pertinent codes and regulations and with selected standards of the American Society for Testing and Materials.

1.03 PRODUCT HANDLING:

- A. Promptly process and distribute test reports and related instructions to assure necessary retesting and/or replacement of materials with least possible delay in work.

PART 2: PRODUCTS:

2.01 PAYMENT FOR RETESTING SERVICES:

- A. Retesting: When initial tests indicate non-compliance with Contract Documents, subsequent retesting shall be performed by the same laboratory and costs borne by Contractor.

2.02 CODE COMPLIANCE TESTING:

- A. Inspections and test required by codes or ordinances, or by plan approval authority, and made by a legally constituted authority, shall be the responsibility of, and shall be paid for, by the Contractor.

2.03 CONTRACTORS CONVENIENCE TESTING:

- A. Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

PART 3: EXECUTION:

3.01 COOPERATION WITH TESTING LABORATORY:

- A. Representative of testing laboratory shall have access to Work at all times; provide facilities for such access in order that laboratory may properly perform its functions.

3.02 SCHEDULES FOR TESTING:

- A. Establishing Schedule:
 - 1. Determine with laboratory, time required to perform tests and issue findings.
 - 2. Provide required time in construction schedule.
- B. Revising Schedule: Coordinate changes of schedule with laboratory as required. Testing Laboratory shall provide a twenty-four (24) hour phone number to enable the Contractor to revise the schedule at times other than regular business hours.
- C. Adherence to Schedule: When laboratory is prevented from testing or taking specimens according to the determined schedule due to incompleteness of work, extra costs attributable to delay may be backcharged to Contractor and not borne by Owner.

3.03 TAKING SPECIMENS:

- A. Testing Laboratory shall perform the following services:
 - 1. Take samples and specimens.
 - 2. Furnish sampling equipment and personnel.
 - 3. Deliver specimens and samples to laboratory.

END OF SECTION 01400

SECTION 01530

BARRIERS

PART 1: GENERAL:

1.01 FENCING AND BARRICADES:

- A. Provide proper and adequate barricades, runways, safety handrails, fencing or other safety items to protect and provide access in or around the site by other than construction personnel. Non construction personnel must be accompanied by general contractor, **engineer** or architect representative, owner or owner representative.
- B. Provide all vertical shafts with safe, temporary railings and supports, adequately braced.
- C. Cover trenches and holes when not in use. Erect barriers at sharp changes in plane more than 3 feet high.

1.02 CONSTRUCTION FENCE:

- A. Provide a construction fence around the structure and material storage areas to prevent unauthorized entry to the construction site.
- B. Install fence at the beginning of excavation operations and maintain in good condition until removal is approved by the **Engineer**.
- C. Unless otherwise required by local codes or ordinances, construct wire mesh fence a minimum of 8'-0" high with securely anchored line, corner and gate posts.
- D. Provide a minimum number of gates which will be padlocked shut during nonworking hours.
- E. Locate pedestrian entrance gates as required to provide controlled personnel entry, in suitable relation to construction parking facilities.
- F. Provide a 6 foot high fabric screen to prevent dust and debris from exiting the limits of construction area during the duration of the project.

1.03 REMOVAL:

- A. Completely remove barricades and other safety barriers including foundations, when construction has progressed to the point that they are no longer needed, and when approved by **Engineer**.
- B. Clean and repair damage caused by installation, fill and grade the areas of the Site to required elevations and slopes, and clean the area.

END OF SECTION 01530

SECTION 01700

CONTRACT CLOSEOUT

PART 1: GENERAL:

1.01 REQUIREMENTS

- A. Comply with requirements stated in Conditions of Contract and in Specifications for administrative procedures in closing out the Work.
- B. Related requirements in other parts of the Project Manual:
 - 1. Fiscal provisions, legal submittals and additional administrative requirements: Conditions of the Contract.
- C. Related requirements specified in other Sections:
 - 1. CLEANING:
 - 2. PROJECT RECORD DOCUMENTS:
 - 3. OPERATING AND MAINTENANCE DATA:
 - 4. WARRANTIES AND BONDS:
 - 5. CONTRACTOR'S ASBESTOS FREE AFFIDAVIT:
- D. Provide 3 binders (hard copy), 2 DVD or USB copies containing PDF files, organized in a PDF portfolio with index, containing all pertinent information in this section and related sections.

1.02 SUBMITTAL COMPLETION:

- A. When Contractor considers the Work is substantially complete, he shall submit to **Engineer**, written notice that the Work, or designated portion thereof, is substantially complete and include a list of items (Contractor's punchlist) that have already been addressed.
- B. Within a reasonable time after receipt of such notice, **Engineer** will review the work to determine the status of completion.
- C. Should **Engineer** determine that the work is not substantially complete:
 - 1. **Engineer** will promptly notify the Contractor in writing, giving the reasons therefore including list of items to be completed or corrected.
 - 2. Contractor shall remedy the deficiencies in the Work, and send a second written notice of substantial completion to the **Engineer**.
 - 3. **Engineer** will re-review the Work.
- D. When **Engineer** concurs that the Work is substantially complete, the **engineer** will:
 - 1. Prepare a Certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected, as verified and amended by the **Engineer**.
 - 2. Submit the Certificate to Owner and Contractor for their written acceptance of the responsibilities assigned to them in the Certificate.

1.03 CONTRACTOR CERTIFICATION OFFICIAL COMPLETION:

- A. When Contractor considers the Work is complete, he shall submit **written certification** that:

1. Contract Documents have been reviewed.
 2. Work has been inspected for compliance with Contract Documents.
 3. Work has been completed in accordance with Contract Documents.
 4. Equipment and systems have been tested in the presence of the Owner's representative and are operational.
 5. Work is completed.
- B. **Engineer** will review the work to verify the status of completion with reasonable promptness after receipt of such certification.
- C. Should **Engineer** consider that the Work is incomplete or defective:
1. **Engineer** will promptly notify the Contractor in writing, listing the incomplete or defective work.
 2. Contractor shall take immediate steps to remedy the stated deficiencies, and send a second written certification to **Engineer** that the Work is complete.
 3. **Engineer** will re-inspect the Work.
- D. When the **Engineer** finds that the Work is acceptable under the Contract Documents, the **engineer** shall request the Contractor to make closeout submittals.

1.04 RE-REVIEW FEES:

- A. Should **Engineer** perform re-review due to failure of the Work to comply with the claims of status of completion made by the Contractor:
1. Owner will deduct the amount of such compensation from the final payment to the Contractor, for re-review compensation to **engineer**.

1.05 CONTRACTORS CLOSEOUT SUBMITTALS:

- A. Evidence of compliance with requirements of governing authorities:
1. Certificate of Occupancy.
 2. Certificate of Inspection.
 - a} Mechanical
 - b} Electrical
 3. Fire Sprinkler Certificate
 4. City County underground approvals for all plumbing and electrical lines.
- B. List of all subcontractors and suppliers organized by specification section.
- C. Project Record Documents: refer to Requirements of Section 01720.
- D. Operating and Maintenance Data, Instructions to Owner's Personnel: Refer to requirements of Section 01730.
- E. Warranties and Bonds.
- F. Keys and Keying Schedule: Refer to requirements of Finish Hardware section.
- G. Provide AIA Document G706A, Contractor's Affidavit of Release of Liens: Refer to requirements of General and Supplementary Conditions.
- H. MSDS- Material safety data sheets to be included in close out documents.

- I. Provide AIA Document G707, Consent of Surety to Final Payment Form.
- J. Contractor's asbestos free affidavit:
- K. **Not Used.**
- L. Digital construction photographs organized by date.

1.06 FINAL ADJUSTMENTS OF DOCUMENTS:

- A. Submit a final statement of accounting to **Engineer**. Statement shall reflect all adjustments to the Contract sum:
 - 1. The original Contract sum.
 - 2. Additions and deductions resulting from:
 - a} Previous change orders.
 - b} Allowances.
 - c} Unit Prices.
 - d} Deductions for uncorrected work.
 - e} Deductions for re-review payments.
 - f} Other adjustments.
 - 3. Total Contract sum, as adjusted.
 - 4. Previous payments.
 - 5. Sum remaining due.
- B. **Engineer** will prepare a final Change Order, reflecting approved adjustments to the Contract sum, which were not previously made by Change Orders.

1.07 FINAL APPLICATION FOR PAYMENT:

- A. Contractor shall submit the final Application for Payment, labeled as Final, and in accordance with procedures and requirements stated in the Conditions of the Contract.

END OF SECTION 01700

SECTION 01710

CLEANING

PART 1: GENERAL:

1.01 DESCRIPTION:

- A. Execute cleaning, during progress of the Work, and at completion of the Work, as required by General Conditions.

1.02 DISPOSAL REQUIREMENTS:

- A. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

PART 2: PRODUCTS:

2.01 MATERIALS:

- A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
- B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.
- C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3: EXECUTION:

3.01 DURING CONSTRUCTION:

- A. Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations or his subcontractor's operations. Oversee cleaning and ensure that building and grounds are maintained free from accumulations of waste materials and rubbish.
- B. At reasonable intervals during progress of work, cleanup site, building and access, and dispose of waste materials, rubbish and debris. Provide containers and locate on site for collection of waste materials, rubbish and debris. Do not allow waste materials, rubbish and debris to accumulate and become an unsightly or hazardous condition.
- C. Transport waste materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces. Sprinkle dusty debris with water.
- D. Burning or burying of rubbish and waste materials on the project site is not permitted. Disposal of volatile fluid wastes (such as mineral spirits, oil, or paint thinner) in storm or sanitary sewer systems is not permitted. Remove waste materials, rubbish and debris from the site and legally dispose of at public or private dumping areas off the Owner's property.
- E. Contractor shall coordinate efforts to properly protect new and existing material from damage by ongoing construction work.

3.02 FINAL CLEANING:

- A. At completion of construction and just prior to acceptance or occupancy conduct a final inspection of exposed surfaces. Perform final cleaning and maintain cleaning until building, or portion thereof, is accepted by Owner.
- B. Remove dirt stains, labels, fingerprints and other foreign materials from surfaces. Repair marred surfaces to match adjacent finishes.

- C. Remove all waste materials and rubbish from and about the Project as well as all tools, construction equipment, machinery and surplus materials.

END OF SECTION 01710

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1: GENERAL:

1.01 GENERAL:

- A. Maintain at the site for the Owner one record copy of:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other Modifications to the Contract.
 - 5. Architect/Engineer Field Orders or written instructions.
 - 6. Approved Shop Drawings, Product Data and Samples.
 - 7. Field Test records.
 - 8. Construction photographs.
 - 9. Meeting Reports.
- B. The Contractor shall use one set of Construction Drawings provided to the Contractor at the time construction is commenced. These Drawings shall be marked-up by each Contractor, throughout the construction period, indicating all changes, revisions and additions to the Work, including field relocations of work concealed from view.

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES:

- A. Store documents and samples in Contractor's field office apart from documents used for construction.
 - 1. Provide files and racks for storage of documents.
 - 2. Provide locked cabinets or secure storage space for storage of samples.
- B. File documents and samples in accordance with Data Filing Format of the Uniform Construction Index.
- C. Maintain documents in a clean, dry, legible condition and in good order. DO not use record documents for construction purposes.
- D. Make documents and samples available at all times for view by **Engineer**.

1.03 RECORDING:

- A. Label each document "PROJECT RECORD" in neat large printed letters.
- B. Record information concurrently with construction progress. DO not conceal any work until required information is recorded.
- C. Drawings: Legibly mark to record actual construction:
 - 1. Depths of various elements of foundation in relation to finish first floor datum.
 - 2. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
 - 4. Field changes of dimension and detail.

5. Changes made by Field Order or by Change Order.
6. Details not on original Contract Drawings.

D. Specifications and Addenda: Legibly mark each Section to record:

1. Manufacturer, trade name, catalog number, and supplier of each Product and item of equipment actually installed.
2. Changes made by Field Order or by Change Order.

1.04 SUBMITTAL:

- A. At the completion of work, Contractor shall certify, by endorsement thereof, that each of the revised drawings is complete and accurate. Prior to Contractor's application for final payment, and within forty-five {45} days of final acceptance of all the work by the Owner, unless otherwise modified by the Contract Agreement, and as a condition of acceptance by the Owner, Contractor shall deliver the certified Record Documents to the **Engineer** for transmittal to the Owner.

END OF SECTION 01720

SECTION 01730

OPERATING AND MAINTENANCE DATA

PART 1: GENERAL:

1.01 INFORMATION DATA:

- A. Compile Manufacturer's Directions and Manuals, Product Data and related information appropriate for Owner's maintenance and operation of product furnished under the Contract.
 - 1. Furnish operating and maintenance data as specified in other pertinent sections of Specifications.
- B. Instruct Owner's personnel in the maintenance of products and in the operation of equipment and systems.

1.02 FORM OF SUBMITTALS:

- A. Prepare data in the form of an instructional manual for use by Owner's personnel.
- B. Provide indexed tabs fly-leaf for each separate product, or each piece of operating equipment. Provide typed description of product and major component parts of equipment.
- C. Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS".
- D. Bind in and identify in DVD PDF files, organized in a PDF portfolio with index.
- E. When multiple binders are used, correlate the data into related consistent groupings.

1.03 CONTENT OF MANUAL:

- A. Neatly typewritten table of contents for each volume, arranged in a systematic order.
 - 1. Contractor, name of responsible principal, address and telephone number.
 - 2. A list of each product required to be included, indexed to the content of the volume.
 - 3. List with each product, the name, address and telephone number of:
 - a. Subcontractor or installer.
 - b. Maintenance contractor, as appropriate.
 - c. Identify the area of responsibility of each.
 - d. Local source of supply for parts and replacement.
 - 4. Identify each product by product name and other identifying symbols as set forth in Contract Documents.
- B. Product Data: Include only those sheets which are pertinent to the specific product. Annotate each sheet to:
 - 1. Clearly identify the specific product or part installed.
 - 2. Clearly identify the data applicable to the installation.
 - 3. Delete references to inapplicable information.
- C. Drawings: Supplement product data with drawings as necessary to clearly illustrate relations of component parts of equipment and systems, and control and flow diagrams.

1. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.
 2. Do not use Project Record Documents as maintenance drawings.
- D. Written text, as required to supplement product data for the particular installation:
1. Organize in a consistent format under separate headings for different procedures.
 2. Provide a logical sequence of instructions for each procedure.
- E. Copy of each warranty, bond and service contract issued. Provide information sheet for Owner's personnel, give:
1. Proper procedures in the event of failure.
 2. Instance which might affect the validity of warranties or bonds.

1.04 MANUAL FOR MATERIALS AND FINISHES:

- A. Submit in electronic file complete manual in final form and document in respective division.
- B. Content, for architectural products, applied materials and finishes:
1. Manufacturer's data, giving full information on products.
 2. Instructions for care and maintenance.
- C. Content, for moisture-protection and weather-exposed products:
1. Manufacturer's data, giving full information on products.
- D. Additional requirements for Maintenance Data: the respective sections of Specification.

1.05 MANUAL FOR EQUIPMENT AND SYSTEMS:

- A. Submit in electronic file complete manual in final form and document in respective division.
- B. Content, for each unit of equipment and system, as appropriate:
1. Description of unit and component parts.
 2. Operating procedures.
 3. Maintenance procedures.
 4. Servicing and lubrication schedule.
 5. Manufacturer's printed operating and maintenance instructions.
 6. Description of sequence of operation by control manufacturer.
 7. Original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance.
 8. As-installed control diagrams by controls manufacturer.
 9. Each contractor's coordination drawings.
 10. Charts of valve tag numbers, with the location and function of each valve.
 11. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
 12. Other data as required under pertinent sections of specifications.
- C. Content, for each electric and electronic system, as appropriate:
1. Description of system and component parts.
 2. Circuit directories of panelboards.
 3. As-installed color coded wiring diagrams.

4. Operating procedures.
 5. Maintenance procedures.
 6. Manufacturer's printed operating and maintenance instructions.
 7. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
 8. Other data as required under pertinent sections of specifications.
- D. Prepare and include additional data when the need for such data becomes apparent during instruction of Owner's personnel.
- E. Additional requirements for Operating and Maintenance Data: the respective sections of specifications.

1.06 INSTRUCTIONS OF OWNER'S PERSONNEL:

- A. Prior to final review or acceptance, fully instruct Owner's designated operating and maintenance personnel in the operation, adjustment and maintenance of all products, equipment and systems.
- B. Operating and maintenance manual shall constitute the basis of instruction.
- C. Review contents of manual with personnel in full detail to explain all aspects of operations and maintenance.

END OF SECTION 01730

SECTION 01740

WARRANTIES AND BONDS

PART 1: GENERAL:

1.01 SUBMITTAL REQUIREMENTS:

- A. Assemble warranties, bonds and services and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.
- B. Review submittals to verify compliance with Contract Documents. Submit to **Engineer** for review and transmittal to Owner.

1.02 TIME OF SUBMITTALS:

- A. For equipment or component parts of equipment put into service during progress of construction submit within ten {10} days after review and acceptance.
- B. Otherwise make submittals within ten {10} days after Date of Substantial Completion, prior to final request for payment.
- C. For items of work, where acceptance is delayed materially beyond the Date of Substantial Completion, provide updated submittal within ten {10} days after acceptance, listing the date of acceptance as the start of the warranty period.

END OF SECTION 01740

SECTION 01 57 13

TEMPORARY EROSION AND SEDIMENT CONTROL

Part 1 GENERAL

1.01 SECTION INCLUDES

- A. Temporary and permanent erosion control system.
- B. Slope Protection System.

1.02 RELATED SECTIONS

- A. Section 31 10 00 - Site Clearing
- B. Section 31 23 00 – Excavation and Fill
- C. Section 32 92 23 - Sodding
- D. Erosion Control Plan
- E. Construction Drawings

1.03 ENVIRONMENTAL REQUIREMENTS

- A. The contractor shall protect adjacent properties and water resources from erosion and sediment throughout the life of the contract.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Quick growing grasses such as wheat, rye or oats (See Section 32 92 23).
- B. Hay or straw bales.
- C. Fencing for siltation control as specified on the plans.
- D. Curlex blankets by American Excelsior Company or approved equal.
- E. Bale stakes for each bale shall be a minimum of 4 feet in length and shall be either #2 rebars, 2 steel pickets or 2-2"x2" hardwood stakes driven 1'-6" to 2'-0" into ground.
- F. Temporary mulches such as loose hay, straw, netting, wood cellulose or agricultural silage.
- G. Fence stakes shall be metal stakes a minimum of 8 feet in length.
- H. RipRap (See Section 31 37 00)

PART 3 EXECUTION

3.01 PREPARATION

- A. Review site erosion control plan.
- B. Deficiencies or changes in the erosion control plan as it is applied to current conditions will

be brought to the attention of the Owner and the Engineer for remedial action.

3.02 EROSION CONTROL AND SLOPE PROTECTION IMPLEMENTATION

- A. Place erosion control systems in accordance with the erosion control plan.
- B. The Owner has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and embankment operations and to direct the contractor to provide immediate permanent or temporary pollution control measures. The contractor will be required to incorporate all permanent erosion control features into the project at the earliest practical time to minimize the need for temporary controls. Cut slopes shall be permanently seeded and mulched as the excavation proceeds to the extent considered necessary and practical.
- C. The temporary erosion control systems installed by the contractor shall be maintained as directed by the Owner to control siltation at all times during the life of the contract. The contractor must respond to any maintenance or additional work ordered by the Owner within a 48 hour period.
- D. Any additional material and work required and authorized by the Owner which is beyond the extent of the erosion control plan shall be paid for by the owner.
- E. Slopes that erode easily shall be temporary seeded as the work progresses with a wheat, rye or oats application (See Section 32 92 23).

END OF SECTION 01 57 13

SECTION 01 73 29

CUTTING AND PATCHING

Part 1 GENERAL

1.01 SECTION INCLUDES

- A. Cutting, patching and fitting of the work or work under construction.
- B. Coordinating installation or connection of the work to existing facilities, uncovering work for access, inspection or testing and related items.

1.02 CUTTING AND PATCHING

- A. Perform activities to avoid interference with facility operations and other work.
- B. Execute cutting and patching, including excavation, backfill and fitting to:
 - 1. Remove and replace defective work or work not conforming to Drawings and Specifications.
 - 2. Take samples of installed work as required for testing.
 - 3. Remove constructions required to provide for specified alterations or additions to existing work.
 - 4. Uncover work to allow inspection or re-inspection by Project Manager or regulatory agencies having jurisdiction.
 - 5. Connect uninstalled work to completed work in proper sequence.
 - 6. Remove or relocate existing utilities and pipes that obstruct work.
 - 7. Make connections or alterations to existing or new facilities.
 - 8. Provide openings, channels, chases and flues and cut, patch and finish
 - 9. Provide protection for other portions of the work
- C. Restore existing work to a condition equal to or better than that which existed prior to cutting and patching, and to standards required by contract.
- D. Support, anchor, attach, match, trim, and seal materials to work of others unless otherwise specified. Furnish and install sleeves, inserts and hangers required for execution of the work.
- E. Provide shoring, bracing and support necessary to maintain structural integrity and to protect adjacent work from damage during cutting and patching. Request written approval from Project Manager before cutting structural members such as beams, anchors, or other supports.
- F. Match new materials to existing materials by bonding, lapping, mechanically tying, anchoring or other effective means in order to prevent cracks and to minimize evidence of patching. Conceal effects of demolition and patching, and avoid breaks, joints or changes of surface appearance unless shown on drawings or authorized by Project Manager.

1.03 SUBMITTALS

- A. Submit written request to Project Manager for consent to proceed before conducting operations that may affect design function, regular operations, or other work.
- B. Notify Project Manager in writing when work will be uncovered for observation. Do not begin patching or cutting operations until notification is sent to Project Manager.

1.04 CONNECTIONS TO EXISTING FACILITIES

- A. Perform construction operations necessary to complete connections and tie-ins to existing facilities. Keep existing facilities in continuous operation unless otherwise permitted or approved in writing by Project Manager.
- B. Coordinate interruption of services requiring connection to existing facilities with Project Manager. Provide temporary pumping facilities to handle wastewater if necessary.
- C. Submit 48 hours in advance a detailed schedule of proposed connections that will include any shutdowns or bypasses. Include time and date as well as anticipated duration of work.

END OF SECTION 01 73 29

SECTION 02220**DEMOLITION****Part 1 GENERAL****1.01 SCOPE:**

This section covers the labor and material necessary for the work associated with the demolition of the buildings and structures as shown on the drawings and specified herein.

Disconnecting, capping and removing identified utilities.

1.02 REGULATORY REQUIREMENTS:

- A. Conform to applicable codes, regulations and/or permits for demolition of structures, safety of adjacent structures, dust control, runoff control and sludge disposal. The City of Edinburg Noise Ordinance will be strictly enforced.
- B. Conform to applicable regulatory procedures when discovering hazardous or contaminated materials.
- C. No blasting will be allowed.

1.03 SUBMITTALS:

- A. The Contractor shall submit to the Owner a schedule of demolition, detail methods of demolition to be used on each structure, copies of authorization, and permits to demolish the structures. *The Contractor will not proceed without approval.*
- B. Provide a detailed plan of action including a timeline for activities, in advance, for Owner review or approval. The CONTRACTOR shall not proceed without City of Edinburg approval.
- C. Describe demolition removal procedures and schedule. Demolition activities will be limited to 8 a.m. to 5 p.m., Monday through Friday. No Work on Saturday or Sunday without prior written approval from the Owner.

1.04 PROJECT CONDITIONS:

- A. Each respondent shall visit the site and carefully and thoroughly inspect all existing facilities and take into account, in the preparation of his price all conditions affecting the Work required by the Contract Drawings and Specifications.
- B. Each respondent shall satisfy themselves as to the limits of removal, replacement, and modification of the existing facilities required to complete the Work as indicated on the Contract Drawings and as specified herein.
- C. Locate existing exposed and buried utilities and determine the requirements for their protection, or their disposition with respect to the demolition work.

1.05 PROTECTION:

- A. Protect all reference points, bench marks and monuments from dislocation or damage. Replace or repair immediately any point's damage, destroyed or dislocated. Protect and maintain all conduits, drains, inlets, sewers, pipes, and wires that are to remain on property.

- B. Provide adequate measures to protect workmen and passerby from falling material and dust. Sprinkle and dampen mortar and other dusty substances from the beginning of work to its completion.
- C. Provide, erect and maintain all lights, barricades, warning signs and guards as necessary for the protection of streets, sidewalks and all adjoining property.
- D. Salvaged materials and rubbish shall be lowered or transported by means of reasonable dust proof chutes of suitable conveyances, and all mortar and other dusty substances shall be sprinkled and dampened from the beginning of such work to its completion.
- E. Take measures for safety of personnel as recommended in the AGC Manual of Accident Prevention I Construction and as required by OSHA.

1.06 JOB CONDITIONS:

- A. Existing Conditions.
 - 1. Do not work or store materials or equipment on public or adjacent property.
 - 2. Do not allow material and debris to accumulate on the site.
- B. Damage: Contractor shall be responsible for any damage to streets, curbs or other property not specifically called for as an item to be demolished.
- C. Protection of Grounds:
 - 1. Contractor shall provide protection of person and property, including all landscape, drives, road, walks, buildings, utilities, etc. Any damage to such shall be corrected to Owner's satisfaction at the CONTRACTOR's expense. The CONTRACTOR must determine the means and methods as required by the Specifications to comply with environmental laws regarding potential lead paint disposal and exposure, including OSHA 29 CFR 1926.62 dealing with cutting steel with protective coatings. The CONTRACTOR must also take into account the provisions set forth in the SPCC Guide No. 6 and 7 when dealing with items containing heavy materials.
- D. Containment of Lead Base Paint:
 - 1. CONTRACTOR shall meet all applicable State, Local and Federal regulations and requirements regarding lead abatement.
 - 2. CONTRACTOR shall provide containment of all loose peeling paint. A containment plan shall be submitted to City of Edinburg and the Engineer for approval prior to the start of any work. If any time the containment system shall fail the CONTRACTOR shall suspend the Work and shall take all actions necessary to correct the cause of failure prior to resuming the Work. Should paint debris fall on adjacent property or public right-of-way, CONTRACTOR shall be responsible to collect debris.
- E. Disposal of Hazardous Material and Liquids:
 - 1. CONTRACTOR shall meet all applicable State, Local and Federal regulations and requirements regarding the disposal of hazardous materials and liquids.
- F. Disposal of Asbestos Material:

1. CONTRACTOR shall meet all applicable State, Local and Federal regulations and requirements regarding the removal, handling, disturbance, and disposal of asbestos materials.
2. The CONTRACTOR shall perform all asbestos removal work in accordance with National Emission Standards for Hazardous Air Pollutants (NESHAP), Occupational Safety and Health Administration (OSHA), City of Edinburg Special Specifications.

Part 2 PRODUCTS

2.01 GENERAL:

- A. The contractor shall provide all materials and equipment in suitable and adequate quantity as required to accomplish the work shown, specified herein, and as required to complete the project.

Part 3 EXECUTION

3.01 SAFETY REQUIREMENTS:

All work shall be done in conformance with the rules and regulations pertaining to safety established by, but not limited to, OSHA, City of Edinburg, and as specified elsewhere in these Specifications.

3.02 REMOVAL AND STORAGE OF EQUIPMENT FOR REUSE:

No equipment shall be removed without the approval and consent of the Owner. The Contractor shall agree to maintain all equipment in the same condition as when it was removed. The condition of the equipment shall be determined prior to removal by the Owner. The Contractor assumes the responsibility of assuring that the equipment is properly stored and maintained.

3.03 PREPARATION:

- A. Arrange for, and verify locations of utility services, prior to beginning operations.
- B. Contractor shall coordinate with City of Edinburg the appropriate time to begin the demolition of water mains, which time shall be solely determined by City of Edinburg considering their operational needs.
- C. Contractor shall minimize the amount of time the existing mains are shut down, subject to the specific requirements set forth in Section 01040 for Shutdowns. City of Edinburg approval is required ahead of all main shutdowns.
- D. Contractor shall provide temporary water by-pass mains as necessary at no additional cost to City of Edinburg.
- E. All work shall be done in conformance with the rules and regulations pertaining to safety established by, but not limited to, OSHA, City of Edinburg, and as specified elsewhere in these Specifications.
- F. Provide, erect, and maintain temporary barriers and security devices. Materials needed for temporary protection in the form of barricades, fences, enclosure etc., may be "used" construction materials of sound condition and reasonably clean.
- G. Protect existing structures and piping that are not to be demolished.
- H. Prevent movement or settlement of adjacent structures. Provide bracing and shoring as required.

- I. Arrange for and verify locations of utility services prior to beginning operations. Mark locations of utilities.
- J. Prior to construction, the contractor shall obtain all required storm water permits, fees, and approvals. No construction or fabrication shall begin until the contractor has received and thoroughly reviewed all permits required for construction in drainage easements.

3.04 DEMOLITION:

- A. Demolish in accordance with demolition procedures submitted to and approved by the Owner.
- B. Contractor shall obtain and pay for required demolition permits and also provide proper chain of custody forms and disposal forms which certify proper disposal of waste materials to an approved disposal/recycling center.
- C. Disconnect and cap designated utilities and piping within demolition areas.
- D. Dust control.
 - 1. Sprinkle debris, and use temporary enclosures as necessary to limit dust to the lowest practicable level.
 - 2. Do not use water to an extent that may cause flooding, contaminated runoff, or icing.
- E. Maintain streets and walks outside barriers free from debris at all times.
- F. The Owner shall be notified of any existing line, wire, pipelines, water lines, sewer lines, or other facility encountered in the demolition, which was not shown on the plans.
- G. Contractor shall protect and maintain any and all items, which are to remain.
- H. Note: Some buildings, pipes or other structures may contain building products that contain both friable and nonfriable asbestos fibers, including tile, siding, roofing panels, pipe and installation. All asbestos materials must be handled and disposed of according to EPA and TCEQ criteria.

3.05 BACKFILLING:

- A. The Contractor shall backfill all demolition areas approximately to existing ground level as applicable, as shown on the Drawings.
- B. Backfill material shall meet the requirements for secondary backfill, as applicable and backfill compaction shall be in accordance with the applicable requirements of Section 02200. Building debris shall not be used as backfill material. In all areas not backfilled the ground level, the Contractor shall erect safety barriers around the excavation.

3.06 PIPE LINES:

- A. Existing pipe shown to be abandoned shall be disconnected from piping to remain active by capping the active line in accordance with the details in the Plans.

3.07 DISPOSAL:

- A. Remove demolition debris continuously as required.
- B. Do not store or sell materials on site.

- C. Transport demolition debris to disposal area off-site.
- D. Perform removal of existing structures scheduled to be removed in a safe, orderly and careful manner, with the considerations at all times for the safety and welfare of the Contractor and his personnel.
- E. Do not permit demolition work, nor any work in connection with this demolition work, to disturb or damage any adjacent structure, its foundation and/or public utilities which are to remain.
- F. Maintain a neat, clean appearance on the site at all times and avoid great accumulation of debris.

3.08 DEMOLITION CLEAN UP:

- A. Remove promptly from the demolition site any rubbish, debris, etc.
- B. Provide traps on trucks and/or other forms of transportation used for hauling materials, rubbish, and/or debris from site. Do not drop or scatter trash, rubbish, etc., along the route of travel either on or after leaving the site.
- C. Any damage caused to the site, including walk, drives, curbs, etc., scheduled to remain shall be immediately repaired and/or replaced at the Contractor's expense *to the satisfaction of Construction Observer Inspector/Engineer*. Contractor shall work to resolve all damage claims in a timely manner.
- D. The CONTRACTOR is responsible for all site restoration and revegetation to match existing grade.

3.09 SALVAGE:

Contractor shall properly store and protect any and all equipment to be salvaged. The contractor shall coordinate with the OWNER for the location of the items to be salvaged and deliver those items to the preferred location. Any damage caused to the salvaged equipment shall be repaired and/or replaced at the Contractor's expense.

END OF SECTION 02220

SECTION 02 41 19

SELECTIVE DEMOLITION

Part 1 GENERAL

- A. Provide all labor, material, equipment, accessories, and incidentals necessary for the complete demolition, cutting, and shoring for areas indicated on plans and/or specified.
- B. The contractor shall take all necessary precautions to avoid damage to pavements, structural members, exterior and interior walls, floor and ceilings, windows, doors and all building/structure components to remain.
- C. Contractor shall be completely liable for any damage incurred to the existing structure or as a result of demolition work. The contractor shall exercise extreme care so as to prevent damage to the building. The contractor shall be familiar with and exercise extreme care at load bearing walls, columns, etc.
- D. All demolition work shall be subject to the documentation.
- E. All demolition work shall be subject to local codes and the architect's/engineer's directions. All materials shall be disposed of at the contractor's expense immediately after determination is made that the material will not be reused.
- F. **Conditions at site:** Contractor shall visit the site to examine the existing structure and conditions and note all conditions as to character and extent of work involved. Contractor shall inform the architect/engineer in writing of any conditions contrary to those indicated on construction documents.
- G. **Permits, ordinances, etc.:** Procure and pay for all necessary permits or certificates required to complete the work as specified. Make any and all required notifications and **comply with all applicable federal, state and local codes, ordinances, and regulations associated with all work under this contract** including but not limited to demolition, temporary shoring, hauling and disposal regulations.
- H. **Quality assurance/regulatory requirements:** Conform to applicable codes and regulations for demolition work, safety of structure, and dust control. Do not close or obstruct streets, walks, or other public right-of ways without prior approval of authorities having jurisdiction. ***If hazardous materials are discovered, notify owner and architect/engineer and await instruction.*** Minimize interference with streets, walks, other public right-of-ways, and adjacent facilities.
- I. **Explosives:** Use of explosive will not be permitted.
- J. **Burning:** Burning will not be permitted.
- K. **Submittals:** Submit shop drawings to indicate areas for demolition, removal sequence and location of salvageable items, as well as location and construction of temporary work.

PART 2 - LIMITED DEMOLITION

- A. Remove all items shown on plans and any and all obstructions not here aforementioned, but which will interfere with demolition work. Consult with architect/engineer for direction.

- B. Remove existing construction to extent indicated and as necessary to join new work to existing. Do not remove more than is necessary to allow for new construction.
- C. Review plans for areas and items of selective limited demolition. Remove all electrical, plumbing, and mechanical items abandoned or not to be used as noted on plans and as necessary.
- D. ***If any of the following conditions are encountered, cease work immediately, notify architect/engineer, and await instructions:***
 - 1. Structure is in danger of movement or collapse.
 - 2. Materials or conditions encountered differ from those designated in the contract documents.
 - 3. Materials or conditions encountered contain asbestos (ACM'S), polychlorinated biphenyl (PCB'S), lead based paints or other suspected hazardous materials. Protect affected areas from damage and notify owner and architect immediately.
- E. Assign work to trades skilled in the procedures involved.
- F. Plug ends of disconnected utilities with threaded or welded caps.
- G. Any original materials removed & scheduled for reuse shall be placed in suitable containers, labeled, and stored for future use.

PART 3 - MATERIALS

A. Salvage Materials:

- 1. Any materials that are to be removed and reused shall be cleared of all projecting nails and shall be separately stored and clearly labeled. Materials shall be stored in a secure, dry location, sufficiently off the floor/ground.
- 2. Any existing fixtures or equipment to be removed, which have been identified by owner to remain the property of the owner, shall be moved and safely stored away from all construction and demolition operations and activity in an area designated for temporary storage.
- 3. **Disposal of removed material:** All material removed under this contract, which is not to be salvaged, reused, or stored for owner shall become the property of the contractor and be promptly removed from the site, excluding those items that shall remain the property of the owner. Material and equipment to be removed shall not be viewed by prospective purchaser or sold on the site.

B. Existing Facilities To Be Removed:

- 1. Remove indicated walls, partitions or portions thereof.
- 2. Utilities related to equipment: remove existing utilities indicated on drawings and terminate in a manner conforming to the nationally recognized code covering the specific utility and at a time satisfactory to the local regulatory authorities. Re-use all existing conduit, refrigerant lines, and other utility lines which are appropriate for reuse. Re-route utility lines where equipment is relocated and/or as indicated on drawings.

PART 4 - EXECUTION

- A. All demolition shoring, barriers and salvage shall be performed in a safe manner, in accordance with the latest OSHA regulations.

B. Protection:

1. Portion of existing facility may continue to be occupied by owner and render services at the site. All precautions to be taken at occupied areas and all work to be coordinated with architect/owner to minimize downtime and to allow business activities to continue uninterrupted or with minimal acceptable interruptions.
2. Barricade and cover as necessary to protect pedestrians, workmen, and adjacent areas. Protect any existing active service lines whether indicated or not. Provide for the disconnection of electrical, telephone, gas, or other lines servicing the structures per rules and regulations of authorities having jurisdiction.
3. Wherever necessary for the protection of workmen and others; wall, partitions or ceilings being demolished shall be shored or braced. **Structural or load-supporting members SHALL NOT** be cut or removed without appropriate temporary shoring. Additional temporary shoring shall be installed where it becomes necessary.
4. Execute all demolition work in an orderly and careful manner with due consideration for existing structures, including any parts of the surrounding areas which are to remain. Barricade and cover as necessary to protect pedestrians, workmen and adjacent area. Protect any existing active service lines, indicated or not.
5. Avoid any encroachment on adjacent areas. Repair and make good any damage to the adjoining areas or improvements caused by operations, including any damage or loss to adjoining property owners, whether to buildings, or property.
6. Provide temporary walls for dust protection as required. Limit noise of demolition work to the greatest extent possible. If noise levels are considered excessive by the owner, or architect/engineer, the contractor will be required to continue that specific operation at different hours
7. Conduct operations so as not to interfere with activities at occupied portion of site.
8. **Existing Work:** Protect existing work which is to remain in place, that is to be reused, or which is to remain the property of the owner by temporary covers, shoring, bracing and supports. Do not overload structural elements. Provide new supports and reinforcement for existing construction weakened by demolition or removal work.
9. **Weather Protection:** Protect building interior and all materials and equipment from the weather at all times including through walls, openings and roof.
10. **Personnel:** Where pedestrians, owner's employees, customers and/or driver safety is endangered in the area of removal or construction/re-construction, use traffic barricades with flashing lights or other adequate protective temporary structures, and notify the proper authorities prior to beginning any such work.

11. **Facilities:** Protect all electrical and mechanical services and utilities. Where removal of existing utilities is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities.
- C. **Noise and Dust Control:** Conduct work to minimize noise and spread of dust and debris. Take appropriate action to check the spread of dust and debris to avoid the creation of a nuisance in the surrounding areas. Do not use water if it results in hazardous or objectionable conditions, such as flooding or pollution. Comply with all regulations imposed by local air pollution agencies.
- D. **Filling:** Properly fill holes and other hazardous openings.
- E. **Clean Up:** Remove and transport debris and rubbish in a manner that will prevent spillage on streets or adjacent areas. Clean-up any spillage from streets and adjacent areas. On completion of demolition work, leave the property and adjacent areas in a clean condition satisfactory to local authorities and the architect.

END OF SECTION 02 41 13

SECTION 03 10 00

CONCRETE FORMING AND ACCESSORIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Formwork for cast-in place concrete, with shoring, bracing and anchorage.
- B. Form accessories.
- C. Form stripping.

1.2 RELATED REQUIREMENTS

- A. Section 03 20 00 – Concrete Reinforcing.
- B. Section 03 30 00 – Cast-in-Place Concrete.
- C. Section 03 39 00 – Concrete Curing.
- D. Section 04 20 00 – Unit Masonry: Spacing for veneer anchor reglets recessed in concrete.

1.3 REFERENCE STANDARDS

- A. ACI 117 – Standards Specifications for Tolerances for Concrete Construction and Materials; Latest Edition.
- B. ACI 301 – Specifications for Structural Concrete for Buildings; American Concrete Institute; Latest Edition.
- C. ACI 318 – Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute; Latest Edition.
- D. ASME A17.1 – Safety Code for Elevators and Escalators; The American Society of Mechanical Engineers; Latest Edition.

1.4 DESIGN REQUIREMENTS

- A. Design, engineer and construct formwork, shoring and bracing to conform to design and code requirements; resultant concrete to conform to required shape, line and dimension.

1.5 SUBMITTALS

- A. See Section – Administrative Requirements, for submittal procedures.
- B. Manufacturer's Literature: Submit copies of manufacturer's product specifications and installation instructions for manufactured products, including form sealer and release agent.
- C. Shop Drawings: Indicate pertinent dimensions, materials, bracing, and arrangement of joints and ties.
- D. Shop Drawings for formwork where concrete is exposed to view that show form construction including jointing, special form joint or reveals, location and pattern of form tie placement and other items that become a feature of the wall.

1.6 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
- B. Maintain one copy of each installation standard on site throughout the duration of concrete work.
- C. Industry Standards
 - 1. American Concrete Institute, ACI-301, Specifications for structural concrete for buildings.
 - 2. American Concrete Institute, ACI-318, Building code requirements for reinforced concrete.
 - 3. American Concrete Institute, ACI-347, Recommended practice for concrete formwork.
 - 4. American Concrete Institute, ACI-SP-15, Field reference manual.

5. Southern Pine Inspection Bureau (SPIB) Grading Rules.
6. Western Wood Products Association (WWPA) Grading Rules.
7. American Plywood Association (APA) Grading Rules.
- D. Allowable Tolerances: Construct formwork within tolerance requirement of ACI 347 – or as approved by architect. Maximum deflection of form facing material between supports shall be limited to $0.0025 \times \text{span}$.

1.7 REGULATORY REQUIREMENTS

- A. Conform to applicable code for design, fabrication, erection and removal of formwork.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver void forms and installation instructions in manufacturer's packaging.
- B. Storage void forms off ground in ventilated and protected manner to prevent deterioration from moisture.

PART 2 PRODUCTS

2.1 FORMWORK - GENERAL

- A. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-in-place concrete work.
- B. Design and construct to provide resultant concrete that conforms to design with respect to shape, lines, and dimensions.
- C. Comply with applicable State and local codes with respect to design, fabrication, erection, and removal of formwork.

2.2 WOOD FORM MATERIALS

- A. Forms for Exposed Finish Concrete: Plywood with Formica Faced; or Other Acceptable Panel-Type Materials, To Provide Continuous Straight, Smooth, Exposed Surfaces, Furnish in Largest Practicable Sizes to Minimize Number of Joints and to Conform to Joint System Shown on Drawings.
- B. Forms of Unexposed Finish Concrete: Plywood Timber, Metal or Other Acceptable Material. Provide lumber dressed on at least 2 edges and side for tight fit.
- C. Forms for Textures Finish Concrete: Units of Face Design, Size Arrangement, and configuration to match architect's control sample. Provide solid backing and firm supports to ensure stability of textured form liners.
- D. Forms for Cylindrical Columns: Metal, Fiberglass-Reinforced Plastic, Paper or Fiber Tubes with Formica Interior Face. Provide paper of fiber tubes of laminated plies with water-resistant adhesive and wax-impregnated exterior for weather and moisture protection. Provide units with sufficient wall thickness to resist wet concrete loads without deformation.
- E. Form Coatings; Sealers and Release Agents: Provide commercial formulated form-coating compounds that will not bond with, stain or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces. Use single source for all forms.
- F. Form Ties: Factory-Fabricated, Adjustable-Length, Removable or Snap-Off Metal Form Ties, Designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units that will leave no metal closer than 1 1/2 inches to exposed surface. Spreader cones on ties shall not exceed 1 inch in diameter.
- G. Earth Forms: Forms for footings may be cut into earth provide that earth is dry stable, level and sound. Provide full depth forming at all perimeter grade beams and footings exterior face.

2.3 PREFABRICATED FORMS

- A. Manufacturers:
 1. Alabama Metal Industries Corporation: www.amico-online.com

2. Molded Fiber Glass Construction Products Co: www.mfgcp.com
3. Reward Wall Systems: www.rewardwalls.com
4. Substitutions: See Section – Product requirements.
- B. Void Forms: Moisture resistant treated paper faces, biodegradable, structurally sufficient to support weight of wet concrete mix until initial set; 2 inches thick.

2.4 FORMWORK ACCESSORIES

- A. Form Ties: Removable type, galvanized metal, fixed length, with waterproofing washer, free of defects that could leave holes larger than 1 inch in concrete surface.
- B. Form Release Agent: Colorless mineral oil that will not stain concrete.
- C. Flashing Reglets: Galvanized steel, 22 gage thick, longest possible lengths, with alignment splines for joints, foam filled, release tape sealed slots, anchors for securing to concrete formwork.
- D. Waterstops: Preformed mineral colloid strips, 3/8 inch thick, moisture expanding.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

3.2 ERECTION - FORMWORK

- A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301.
- B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
- C. Arrange and assemble formwork to permit dismantling and strip. Do not damage concrete during stripping. Permit removal of remaining principal shores.
- D. Coordinate this section with other sections of work that require attachment of components to formwork.
- E. If formwork is placed after reinforcement, resulting in insufficient concrete cover over reinforcement, request instruction from Hinojosa Engineering, Inc. before proceeding.
- F. General: Design, Erect, Support, Brace and maintain formwork to support vertical and lateral loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, Shape, Alignment, Elevation and Position. Maintain formwork construction tolerances complying with ACI 347.
- G. Construct Forms to Sizes, Shapes, Lines, and Dimensions shown and to obtain accurate alignment, Locations, Grades, Level, and plumb work in finished structures. Provide for openings, Offsets, Keyways, Rustications, Chamfers, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent leakage of cement paste.
- H. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for easy removal.
- I. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection and for placement of concrete. Locate temporary openings in forms at inconspicuous locations.
- J. Chamfer exposed corners and edges as indicated, using Wood, Metal, PVC or Rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

3.3 APPLICATION – FORM RELEASE AGENT

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
- B. Apply prior to replacement of reinforcing steel, anchoring devices, and embedded items.

- C. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.
- D. Forms Coated to prevent bond with concrete shall be done in accordance with manufacturer's instructions. Materials which will stain or discolor the concrete shall not be applied to the form surfaces.

3.4 FORM CLEANING

- A. Clean forms as erection proceeds, to remove foreign matter within forms.
- B. Clean formed cavities of debris prior to placing concrete.
- C. Thoroughly clean forms and adjacent surfaces to receive concrete. Remove Chips, Wood, Sawdust, Dirt or other debris just before concrete is placed. Retighten forms and bracing before concrete placement as required to prevent mortar leaks and maintain proper alignment

3.5 FORM TOLERANCES

- A. Construct formwork to maintain tolerances required by AC 117.
- B. Construct and align formwork for elevator hoistway in accordance with ASME A17.1

3.6 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests.

3.7 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
- B. General: Formwork not supporting weight of concrete, such as sides of walls, and slabs may be removed after cumulatively curing at not less than 50 degrees for 48 hours after placing concrete, provide concrete is sufficiently hard to not be damaged by forms-removal operations, and provided curing protection operations are maintained.
- C. Contractor shall assume full responsibility for removal of formwork and forms shall be removed in such a manner as to insure complete safety of structure.

END OF SECTION 03 10 00

SECTION 03 20 00

CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Reinforcing steel for cast-in-place concrete.
- B. Supports and accessories for steel reinforcement.

1.2 RELATED REQUIREMENTS

- A. Section 03 30 00 – Cast-in-Place Concrete.

1.3 REFERENCE STANDARDS

- A. ACI 301 – Specifications for Structural Concrete for Buildings; American Concrete Institute International; 2005
- B. ACI SP-66 – ACI detailing Manual; American Concrete Institute International; 2004.
- C. ASTM A 185/A 185M – Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete; 2007.
- D. ASTM A 615/A 615M – Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2007.
- E. CRSI (DA4) – Manual of Standard Practice; Concrete Reinforcing Steel Institute; 2001.

1.4 SUBMITTALS

- A. See Section – Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Comply with requirements of ACI SP-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.

1.5 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 301.

PART 2 PRODUCTS

2.1 REINFORCEMENT

- A. Reinforcing Steel: ASTM A 615/A 615M Grade 60 (420)
 - 1) Deformed billet-steel bars.
 - 2) Unfinished.
- B. Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain type.
 - 1) Flat Sheets.
 - 2) Mesh Size: 4 x 4.
 - 3) Wire Gage: W2.9 x W2.9 or as indicated on the plans.
- C. Reinforcement Accessories:
 - 1) Tie Wire: Annealed, minimum 16 gage.
 - 2) Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
 - 3) Provide stainless steel or plastic components for placement within 1-1/2 inches of weathering surfaces.

2.2 FABRICATION

- A. Fabricate concrete reinforcing in accordance with CRSI (DA4) – Manual of Standards Practice.
- B. Welding of reinforcement is not permitted.

PART 3 EXECUTION

3.1 PLACEMENT

- A. Place, support and secure reinforcement against displacement. Do not deviate from required position.
- B. Do not displace or damage vapor barrier.
- C. Accommodate placement of formed openings.
- D. Maintain concrete cover around reinforcing as follows:
 - 1) Footings and Concrete Formed Against Earth: 3 inch.
 - 2) Slabs on Fill: 2 inch.
- E. Conform to applicable code for concrete cover over reinforcement.

END OF SECTION 03 20 00

SECTION 03 30 00**CAST-IN-PLACE CONCRETE****PART 1 - GENERAL****1.1 SECTION INCLUDES**

- A. Labor, materials, services and equipment required in conjunction with or properly incidental to placing of cast-in-place concrete slabs, building members, and MEP equipment pads as described herein or as shown on the Drawings, including but not limited to:
 - 1. Concrete mix designs.
 - 2. Assistance with Owner provided laboratory testing of concrete.
 - 3. Installation of items to be built-in formwork or embedded in concrete but furnished by other trades, including metal anchors, anchor slots, reglets, hangers, supports, ties, inserts, bolts, corner guards, and sleeves.
 - 4. Cast-in-place concrete, with formwork, under slab vapor barrier, reinforcing, accessories, appurtenances, finishing and curing required to complete concrete work.
 - 5. Grouting under structural steel base plates.
 - 6. Foundation for columns, walls, and slabs on grade.
 - 7. Super-structure for walls, columns, slabs, curbs, stairs, steps, equipment pads, walks, and pre-molded expansions joints.
- B. Examine the drawings for Plumbing, Mechanical, and Electrical work. These subcontractors will furnish and set sleeves or box forms required for openings. Contractor shall use care in placing reinforcement and pouring concrete so as not to displace such sleeves or boxes.
 - 1. All slots, chases, recesses, or openings indicated on the drawings, which are not formed by sleeves or boxes shall be provided in locations shown. When the work of other contractors is completed, the excess part of the openings shall be completely closed with concrete.

1.2 RELATED REQUIREMENTS

- A. Division 1 Sections applicable to the Work of this Section.

1.3 RELATED SECTIONS

- A. Section - Testing and Inspecting Services
- B. Section 04 20 00 - Unit Masonry
- C. Section 05 12 00 - Structural Steel
- D. Section 05 50 00 - Miscellaneous Metals
- E. Section 31 00 00 - Earthwork
- F. Electrical and Mechanical Drawings and Specifications for sleeves, conduit, and other items embedded in concrete.

1.4 QUALITY ASSURANCE

- A. Where standards or requirements of this Section are in conflict with those noted on the Contract Drawings, or the Building Code, the more stringent requirements shall govern. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected. Failure to do so will not relieve the Contractor from performing the Work correctly at no additional expense to the Owner.
- B. Testing Laboratory Services:
 - 1. Test results shall meet or exceed established standards. A technician from the Owner's Testing Laboratory must be present during all operations.
- C. Evaluation and Acceptance:

1. Codes and Standards: The Work described in this Section, unless otherwise noted on the Drawings, or herein specified, shall be governed by the editions of the following codes or specifications approved by authorities having jurisdiction.
 - a. American Association of State Highway and Transportation Officials (AASHTO)
 - 1) TP 23, "Proposed Standard Method of Test for Water Content of Freshly Mixed Concrete Using Microwave Oven Drying"
 - b. American Concrete Institute (ACI)
 - 1) 211.1, "Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete"
 - 2) 214, "Recommended Practice for Evaluation of Strength Test Results of Concrete"
 - 3) 301, "Specifications for Structural Concrete for Buildings"
 - 4) 302, "Guide for Concrete Floor and Slab Construction"
 - 5) 304, "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete"
 - 6) 305, "Hot Weather Concreting"
 - 7) 306, "Cold Weather Concreting"
 - 8) 309, "Standard Practice for Consolidation of Concrete"
 - 9) 311, "ACI Manual of Concrete Inspection"
 - 10) 315, "Manual of Standard Practice for Detailing Reinforced Concrete Structures"
 - 11) 318, "Building Code Requirements for Reinforced Concrete"
 - 12) 347, "Recommended Practice for Concrete Formwork"
 - 13) Keep one copy of "Manual of Concrete Practice" at job site at all times.
 - c. American Society for Testing and Materials (ASTM)
 - 1) A36, Standard Specification for Carbon Structural Steel
 - 2) A108, Standard Specification for Steel Bars, Carbon, Cold-Finished, Standard Quality
 - 3) A123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - 4) A185, Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
 - 5) A615, Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
 - 6) A704, Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement
 - 7) C33, Standard Specification for Concrete Aggregate
 - 8) C42, Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
 - 9) C94, Standard Specification for Ready-Mix Concrete
 - 10) C136, Standard Method for Sieve Analysis of Fine and Coarse Aggregates
 - 11) C150, Standard Specification for Portland Cement
 - 12) C172, Standard Practice for Sampling Freshly Mixed Concrete
 - 13) C260, Standard Specification for Air-Entraining Admixtures
 - 14) C330, Standard Specification for Lightweight Aggregates for Structural Concrete
 - 15) C494, Standard Specification for Chemical Admixtures for Concrete
 - 16) C595, Standard Specification for Blended Hydraulic Cements
 - 17) C881, Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete
 - 18) C979, Standard Specification for Pigments for Integrally Colored Concrete

- 19) C1107, Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-Shrink)
 - 20) C1315, Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete
 - 21) E96, Standard Test Methods for Water Vapor Transmission of Materials
 - 22) E1643, Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs
 - 23) E1745, Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs
 - 24) F710, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
 - d. Federal Specification (FS)
 - 1) D1.4 Structural Welding Code- Reinforcing Steel
 - e. Federal Specification (FS)
 - 1) FF-S-325
 - 2) QQ-Z-325C
 - f. Concrete Reinforcing Steel Institute (CRSI)
 - 1) "Reinforced Concrete – A Manual of Standard Practice"
 - 2) "Recommended Practice for Placing Reinforcing Bars"
 - 3) "Recommended Practice for Placing Bar Supports"
- D. Source Quality Control:
- 1. Concrete production facilities shall meet the requirement for certification by the National Ready Mixed Concrete Association. All ready mix concrete trucks proposed for use on the project shall meet the requirements of NRMCA, Certification of Ready Mix Concrete Production Facilities.
 - 2. Concrete batchers shall be completely interlocked semi-automatic or automatic batchers, as defined by the Concrete Plant Manufacturers Bureau.
 - 3. Concrete batchers shall have graphic, digital, or photographic recorders, which shall register both empty balance and total weight (or volume of water or admixture) of each batched material, time to the nearest minute, date, identification of batch, and numerical count of each batch. Copies of the record shall be furnished to the Inspection and Testing Laboratory.
 - 4. The Inspection and Testing Laboratory shall provide concrete batch plant inspection as follows:
 - a. Provide a qualified inspector with necessary equipment and apparatus to inspect weighing and batching of controlled concrete at batch plant on a random basis, approximately once daily as the concrete is being placed on this project.
 - b. Make certain that materials and batch equipment used are in accordance with requirements of Specifications.
 - c. Check for adjustment in batch weights to compensate for variations in moisture content.
 - d. Submit promptly to Architect, certification of weights used in loads of acceptable concrete which has been batched during plant inspection time.
- E. Concrete Mix Design Criteria:
- 1. Design concrete mixes in accordance with ACI 318, Section 5.3, Proportioning on the basis of field experience and/or trial mixtures.
 - 2. Submit the proposed mix designs for each concrete mix type proposed.
 - 3. Determination of required average strength above specified strength shall be in accordance with ACI 318.
 - 4. If trial mixes are used as the basis for the proposed mix design, mold and cure test cylinders in accordance with ASTM C39. Do not place concrete on project until laboratory reports and results of confirmation cylinder tests have been evaluated by the Inspection and Testing Laboratory and results indicate that proposed mixes will develop required strengths.

5. Inspection and Testing Laboratory shall furnish the Architect with a written evaluation of each proposed concrete mix design submitted by the Contractor.
6. Check mix designs and revise if necessary wherever changes are made in aggregates or in surface water content of aggregate or workability of concrete. Water content shall be the minimum to produce workable mix. The water content shall be verified in the field by use of the Microwave Test.

1.5 SUBMITTALS

- A. Mix Designs: Submit proposed mix designs, including confirmation cylinder test results, in accordance with ACI 318, Section 5.3, Proportioning on the basis of field experience and/or trial mixtures. Submit mix designs to Architect/Engineer and Inspection and Testing Laboratory for evaluation a minimum of 14 days prior to placing concrete. Key requirements:
 1. Combined aggregate gradation.
 2. Proportions of cement, fine and coarse aggregates, and water.
 3. Type, color and dosage of integral coloring compounds, where applicable.
 4. Range of ambient temperature and humidity for which design is valid.
 5. Any special characteristics of mix which require precautions in mixing, placing, or finishing techniques to achieve finished product.
- B. Complete test data for trial mixes or a complete summary of previous project test results for mix design based on standard deviation analysis must be included.
- C. Provide duplicate delivery tickets for each load of ready-mix concrete delivered to site, in accordance with ASTM C94. Show batch weights on each ticket.
- D. Provide mill test reports on an as-used basis for each type and brand of cementitious material used. Provide certification from independent test laboratory indicating underslab vapor retarder compliance with specification and ASTM 1745 Class A requirements.
- F. Provide product data for each accessories item specified but necessarily not listed above which are required for a complete installation, including, but not limited to reinforcing, chairs, admixtures, stains and color pigments, grouts, sealers, vapor retarders and barriers, water stops, epoxy adhesives, curing compounds and anchors.
- G. Provide Shop Drawings for all reinforcing steel. Show bending diagrams, splicing and laps of rods, shapes, dimensions and details of bar reinforcement and accessories.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Mix and deliver concrete to project ready-mixed in accordance with ASTM C94. Mix concrete a minimum of 70 revolutions of transit mix drum at mixing speed. A minimum of 40 revolutions shall be at the production plant.
- B. Schedule delivery so that continuity of any pour will not be interrupted for over 15 minutes.
- C. Place concrete on site within 90 minutes after proportioning materials at batch plant.
- D. Store bagged cement on platforms off ground. Protect stored cement against the elements. Handle and store fine and coarse aggregate separately in manner to prevent intrusion of foreign material or segregation of the material. Protect all reinforcement until used. Do not use any hardened cement.
- E. Mild steel reinforcement at the time of placement of concrete shall be clean and free of all loose dirt, form oil, and other coatings affecting bond.

1.7 JOB CONDITIONS

- A. Hot Weather Concreting:
 1. Follow ACI 301 and ACI 305.
 2. Provide water-reducing retarding admixture conforming to ASTM C494, Type D when necessary to retard initial set. The admixture shall be dispensed in accordance with manufacturer's recommendations.
 3. Maximum concrete temperature shall not exceed 95 degrees F at time of placement.

- a. Concrete with temperatures above 90 degrees F shall be placed only if a high range water reducer (superplasticizer) is added to the mix as directed by the Testing Laboratory to maintain the specified slump during placement.
- B. Cold Weather Concreting: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures.
 - 1. Follow ACI 301 and ACI 306.
 - 2. When ambient temperature at site is below 40 degrees F or is expected to fall to that temperature within ensuing 24 hours, heat water and/or aggregate prior to adding to mix so that temperature of concrete will be between 55 degrees F and 85 degrees F at time of placement.
 - 3. Maintain temperature of deposited concrete between 50 degrees F and 70 degrees F for minimum of seven (7) days after placing.
 - 4. Add the specified non-corrosive accelerator for all floor concrete placed at air temperatures below 50 degrees F.
- C. Temperature Changes: Maintain changes in concrete temperature as uniformly as possible, but in no case exceed change of 5 degrees F per hour or 25 degrees F in any 24 hour period.
- D. Combustion heaters shall not be used during the first 48 hours without precautions to prevent exposure of concrete and workmen to exhaust gasses containing carbon dioxide and/or carbon monoxide.
- E. Admixtures intended to accelerate hardening of concrete or produce higher than normal strength at early periods will not be permitted unless approved by the Architect. The use of calcium chloride is specifically prohibited.

1.8 PRE-INSTALLATION CONFERENCE

- A. Refer to Section – Project Coordination

1.9 SEQUENCING/SCHEDULING

- A. Coordinate Work of this Section with work of other Sections as required to properly execute the Work and as necessary to maintain satisfactory progress of the work of other Sections.

PART 2 - PRODUCTS

2.1 APPROVED MANUFACTURERS

- A. Manufacturers named within this Section are approved for use on the Project for the product for which they are specified. Other manufacturers must have a minimum of five (5) years experience manufacturing the product specified and meet or exceed the specifications for that product. Substitution of products must be in accordance with the General Conditions, Supplementary Conditions, and Section 01 30 00, Submittals to be considered prior to proposal.

2.2 MATERIALS

- A. Formwork:
 - 1. General: Contractor may use any of the following formwork materials as long as material meets the following and will not stain, or impart any undesirable texture, i.e. wood grain, where such texture would be objectionable in an exposed location.
 - a. Wood Forms:
 - 1) Plywood: PS 1, Douglas Fir or Spruce species.
 - 2) Medium Density Overlay (MDO): One (1) side grade; sound undamaged sheets with clean, true edges.
 - 3) Lumber: Southern Yellow Pine species; No. 2 grade, with grade stamp clearly visible.
 - b. Pre-Fabricated Forms:

- 1) Preformed Steel Forms: Minimum 16 gauge matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.
 - 2) Glass Fiber Fabric Reinforced Plastic Forms: Matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.
 - c. Form Liner: Any material recommended by manufacturer to impart finish which will exhibit the finish or design characteristics, i.e. smooth, textured, ribbed, etc. detailed by the Architect for exposed locations as shown or required and capable of being stripped from complex designs without damaging the finish or design. Form liner shall be as manufactured by Symons Corporation, Greenstreak, Inc. or Architect approved equal.
 - d. Self-expanding corkboard expansion joint fillers should conform to ASTM D1752 for exterior work. Joint fillers shall extend full depth of slab or joint and be of thickness and lengths indicated on drawings.
- B. Metal Reinforcement:
1. Bars:
 - a. General: Conform to ACI 315, latest edition.
 - b. Comply with ASTM A615, Grade 60.
 - c. Number 3 bars comply with ASTM A615, Grade 40
 2. Welded Steel Wire Fabric (Mesh): Not permitted in structural concrete, unless approved by Structural Engineer
- C. Concrete, General:
1. Ready-mixed concrete, ASTM C94
 2. Comply with ACI 318.
 3. Concrete must be approved by Architect through design mix and cylinder test of testing laboratory.
 4. Unless approved otherwise by the Architect, use one (1) brand of cement throughout the work where finished surface will be exposed to view.
 5. Strength: Refer to Paragraph 2.3, A.
 6. Unless approved otherwise by the Structural Engineer, use one (1) ready-mix concrete company throughout the project.
- D. Concrete Materials:
- A. Cement:
 - a. Portland Cement, Type I or III, conforming to the requirements of ASTM C150.
 - b. Combined aggregate gradation for slabs and other designated concrete shall be 8 percent - 18 percent for large top size aggregates (1-1/2 in.) or 8 percent - 22 percent for smaller top size aggregates (1 in. or 3/4 in.) retained on each sieve below the top size and above the No. 100.
 - B. Fly ash: Maximum of 25% fly ash by weight is acceptable.
- E. Aggregate:
1. Fine Aggregate: ASTM C33; clean, hard, durable, uncoated, natural and manufactured sand, free of silt, loam or clay.
 2. Coarse Aggregate: ASTM C33; hard, durable, uncoated, crushed stone; gradation in accordance with Size No. 467 for piers and concrete footings and Size No. 67 for all other concrete. Maximum aggregate size in accordance with ACI 318.
 3. Grading shall be in accordance with "Standard Method for Fine Analysis of Sieve and Coarse Aggregates" (ASTM C136).
- F. Water: ASTM C94, Paragraph 4.1.3; potable, clean and free from oil, acid and injurious amount of vegetable matter, alkalies, and other impurities.
- G. Admixtures:
1. Cement-dispersing, water-reducing types. Admixtures shall conform to ASTM C494, Type A or D, and shall be used strictly in accordance with manufacturer's recommendations and as determined by the Inspection and Testing Laboratory. Admixture shall not discolor concrete or in any way affect the appearance of the concrete.

- a. High-range water reducing admixture conforming to ASTM C494, Type F or G shall be used as required and shall be one (1) of the following or Architect approved equal:
 - 1) Eucon 37 (Type F), Eucon 537 (Type G) by The Euclid Chemical Company
 - 2) Rheobuild 1000 (Type F), Rheobuild 716 (Type G) by Master Builders
 - 3) Sikament 300 (Type F), Sikament 86 (Type G) by Sika Chemical Corp.
 - 4) WRDA-19 (Type F), Daracem 100 (Type G) by W.R. Grace
 2. An air-entraining admixture conforming to ASTM C260 shall be used as required on the Drawings and shall be one (1) of the following or Architect approved equal:
 - a. Air-Mix or AEA-92 by The Euclid Chemical Company
 - b. Sika Aer by Sika Corporation
 - c. MB-VR or MB-AE by Master Builders
 3. Prohibited Admixtures: Calcium chloride, thiocyanates or admixtures containing more than 0.05 percent chloride ions are not permitted.
 4. Certification: Written conformance to the above-mentioned requirements and the chloride ion content of admixtures will be required from the admixture manufacturer prior to mix design review by the Architect/Engineer.
- H. Non-Shrink Cement Grout:
 1. The non-shrink grout shall be a factory pre-mixed grout and shall conform to ASTM C1107, "Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-Shrink)." In addition, the grout manufacturer shall furnish test data from an independent laboratory indicating that the grout when placed at a fluid consistency shall achieve 95 percent bearing under a 4 foot x 4 foot base plate. Provide one (1) of the following or Architect approved equal:
 - a. NS Grout by The Euclid Chemical Company
 - b. Five Star Grout by U.S. Grout Corp.
 - c. Horn Non-Corrosive Non-Shrink Grout by Tamms Industries
 - d. Duragrout by L & M Construction Chemicals, Inc.
 - e. Masterflow 713 by Master Builders
 - f. SikaGrout 212 by Sika Corp.
 - g. Sonogrout 10K by Sonneborn
 - h. 588 Grout by W. R. Meadows, Inc.
 - i. US SPEC GP Grout by US Mix Products Company
 2. High Flow Grout: Where high fluidity and/or increased placing time is required, use high flow grout. The factory pre-mixed grout shall conform to ASTM C1107, "Standard Specification for Packages Dry, Hydraulic-Cement Grout (Non-Shrink)." In addition, the grout manufacturer shall furnish test data from an independent laboratory indicating that the grout when placed at a fluid consistency shall achieve 95 percent bearing under a 18 inch x 36 inch base plate. Provide one (1) of the following or Architect approved equal:
 - a. Hi-Flow Grout by The Euclid Chemical Company
 - b. Crystex by L & M Construction Chemicals, Inc.
 - c. Masterflow 928 by Master Builders
 - d. CG-86 Grout by W. R. Meadows, Inc.
 - e. US SPEC MP Grout by US Mix Products Company
- I. Evaporation Retardant:
 1. Evaporation Retardant shall be a thin, continuous film which prevents rapid moisture loss from the concrete surface. For use when concrete operations must be performed in direct sun, wind, high temperatures, or for relative humidity. Products: Subject to compliance with requirements, provide one (1) of the following or Architect approved equal:
 - a. Eucobar by The Euclid Chemical Company
 - b. Confilm by Master Builders
 - c. Evapre by W. R. Meadows, Inc.
 - d. US SPEC Monofilm ER by US Mix Products Company.
 - e. E-Con by L& M Construction Chemicals

- K. Sealer/Densifier: Provide “Euco Diamond Hard” by The Euclid Chemical Company, “Sealhard” by L&M Construction Chemicals, or equal by Master Builders, Sika Corp., Sonneborn, US SPEC, or Architect approved equal.
- L. Chemical Hardener/Dustproofer: Provide “Surfhard” by The Euclid Chemical Company, “Chemhard” by L&M Construction Chemicals, or equal by Master Builders, Sika Corp., Sonneborn, US SPEC, or Architect approved equal.
- M. Curing Compound: dissipating resin type, which chemically breaks down after approximately eight (8) weeks. Membrane forming compound shall meet ASTM C309, Types 1 and 1D Class B, water based, VOC/AIM Compliant. Provide “Kurez DR VOX” by The Euclid Chemical Company, “Cure R” by L&M Construction Chemicals, “1100 Clear” by W. R. Meadows, Inc., US SPEC “Maxcure Resin Clear” by US Mix Products Company, or equal by Master Builders, Sika Corp., BASF, or Architect approved equal.
- N. Curing and Sealing Compound: high solids acrylic copolymer emulsion blend. Membrane forming compound shall meet ASTM C1315, Type 1 Class B. Provide “Super Rez-Seal” by The Euclid Chemical Company, “Dress & Seal” by L&M Construction Chemicals, “VOCOMP 25 1315” by W. R. Meadows, Inc., US SPEC “CS-25-1315” by US Mix Products Company, or equal by Master Builders, Sika Corp., BASF, or Architect approved equal.
- O. Epoxy Adhesive: ASTM C881, two (2) components, 100 percent solids, 100 percent reactive compound suitable for use on dry or damp surfaces. Provide one (1) of the following or Architect approved equal:
- Euco #452 Epoxy System or Euco #620 Epoxy System by The Euclid Chemical Company
 - Sikadur Hi-Mod by Sika Corp.
 - Rezi-Weld 1000 by W. R. Meadows, Inc.
 - US SPEC Maxibond 2500 by US Mix Products Company.
 - Epobond by L& M Construction Chemicals.
- P. Underslab Vapor Retarders and Barriers:
- Vapor Retarder Membrane:
 - Requirements:
 - Class: ASTM E1745, Class A.
 - Water Vapor Permeance: ASTM E96, 0.01 perms maximum.
 - Tensile Strength: ASTM E154 (Section 9, Average), 45.0 pounds per inch, minimum.
 - Puncture Resistance: ASTM D1709 (Method B), 2300 grams, minimum.
 - Provide compatible seam taping and pipe boots or sealing mastic in accordance with manufacturer’s requirements.
 - Provide proof of compliance to Architect at time of delivery of materials.
 - Provide one (1) of the following under entire slab, unless noted otherwise:
 - Stego Wrap 15-mil Vapor Barrier by STEGO INDUSTRIES LLC, San Juan Capistrano, CA (877) 464-7834 www.stegoindustries.com
 - Premoulded Membrane with Plasmatic Core by W.R. Meadows.
 - Zero-Perm by Alumiseal.
 - Vapor Barrier: Under Wood Floors at Gymnasiums, Stages, and Dance Floors, and at Auditorium Areas Below Finish Floor Level: Premoulded Membrane Vapor Seal with Plasmatic Core manufactured by W.R. Meadows, Inc., Hampshire, IL; or Architect approved equal.
 - Below Grade Waterproofing: Provide below grade waterproofing at vertical walls below grade and beneath elevator pit.
- Q. Miscellaneous Structural Metals Associated with Structural Concrete:
- Structural steel pieces, including miscellaneous structural metals placed in concrete, exposed to weather, in permanent contact with soil, or accessible to salt intrusion shall be hot dipped galvanized in accordance with ASTM A123.
 - Structural steel pieces embedded in concrete shall conform to ASTM A36, unless noted otherwise on the Drawings.
 - Welding of inserts, anchors and other steel pieces used in conjunction with structural concrete shall conform to AWS D1.4.

4. Welding of reinforcing steel used in conjunction with structural concrete shall conform to AWS D1.4.
 5. Headed stud anchors shall conform to ASTM A108, minimum tensile strength 60,000 PSI.
 6. Concrete expansion anchors shall be wedge-type anchors, meeting the requirements of FS FF-S-325, Group 11, Type 4, Class 1, plated in accordance with FS QQ-Z-325C, Type 11, Class 3. Size and location shall be as indicated on the Drawings. Products shall be by Hilti Corp., Powers Fasteners, Inc. or Architect approved equal.
- R. Miscellaneous Materials and Accessories:
1. Form ties: Adjustable length and type which will not leave holes larger than 1 inch in diameter in face of concrete. Ties shall be such that when forms are removed, no metal will be within 1 inch of the finished concrete surface. The holes must be patched.
 2. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages, Fasteners: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.
 3. Form Release Agent: Colorless mineral oil which will not stain concrete, or absorb moisture.
 4. Chairs and Spacers: Heavy-duty plastic-type sized to support all reinforcing steel to proper height. Use type with sand cushion pads where concrete is on grade. Provide chairs and spacers Series "B" by W.H.C. Products, Inc., E-Z Chair by Aztec Concrete Accessories, Inc., GTI Bar Chair by General Technologies, Inc., or Architect approved equal.
 5. Waterstops:
 - a. Ribbed flat 3/16 inch by six (6) inch with 1/8 inch ribs, rated for 75 foot of head pressure. Provide factory made corner fittings weld splices with thermostatically controlled heating iron. Style No. 782 by Greenstreak, Inc., or Architect approved equal.
 - b. Contractor's Material Option: Specially formulated preformed joint sealant that provides a lasting,, watertight bond to both fresh and cured concrete surfaces. Synko-Flex Preformed Plastic Adhesive Waterstop and Synko-Flex Primer manufactured by Synko-Flex Products, Division of Henry Company, Houston, Texas; (713) 671-9502 or Architect approved equal.
 6. Carton Void Forms: If shown or required, shall be wax impregnated cardboard trapezoidal shape, with 1/8 inch thick tempered hardboard for top plane when requested by Architect.
 7. Corners: Chamfer, wood strip type; one (1) inch x one (1) inch size; maximum possible lengths.
 8. Dovetail Anchor Slot: Galvanized steel, 22 gauge thick, foam filled, release tape sealed slots, anchors for securing to concrete formwork.
 9. Flashing Reglets: Galvanized steel, 22 gauge thick, longest possible lengths, with alignment splines for joints, foam filled, release tape sealed slots, anchors for securing to concrete formwork.
 10. Bonding Agent: Acrylic latex emulsion type as recommended for bonding new concrete to old concrete.
 11. Integral Color Pigment (If shown or required): Mineral oxide, lightfast, lime-proof, water-resistant type conforming to ASTM C979. Color(s) shall be as selected by Architect from manufacturer's standard color line. Provide one (1) of the following or Architect approved equal:
 - a. ChemSystems, Inc.
 - b. Davis Colors
 - c. New Riverside Ochre Co., Inc.
 - d. L.M. Scofield Company
 12. Color Stain (If shown or required): A chemically reactive stain, designed for adding variegated color to new or old concrete. Color(s) shall be as selected by Architect from manufacturer's standard color line. Provide Lithochrome Chemstain by L.M. Scofield Company or Architect approved equal.
 13. Joint Sealants: Refer to Section 07 90 00, Building Sealants

2.3 CONCRETE MIXES

03 30 00 CAST-IN-PLACE CONCRETE

- A. Strength: Concrete is classified and specified by ultimate compressive strength (f_c) at the age of 28 days. Unless indicated otherwise on the Drawings, strengths shall be as follows:
 - 1. All concrete including grade beams, footings, slabs, and pads: 5 sack/3,000 psi/28 days.
 - 2. Strength recommendations on Structural Drawings supersede when they are greater than specified here.
- B. Interior slabs subjected to vehicular traffic: This concrete shall have a maximum W/cm of 0.48 and maximum air content of 3 percent. No air-entraining admixture shall be added to this mix.
- C. Concrete permanently exposed to freezing and thawing shall contain an air-entraining admixture to produce 4.5 percent - 7.5 percent of air by volume of concrete.
- D. Proportions: Proportions of cement, aggregate, admixture and water to attain required plasticity and compressive strength shall be in accordance with ACI 318, Section 5.3, Proportioning on the basis of field experience and/or trial mixtures. Do not make changes in proportions without submitting proposed changes to Inspection and Testing Laboratory for evaluation.
 - 1. Trial mixtures having proportions and consistencies suitable for the work shall be made based on ACI 211. 1, using at least three (3) different water-cement ratios which will produce a range of strengths encompassing those required for this project.
 - 2. Trial mixes shall be designed to produce a slump within 3/4 inch of the maximum permitted, and for air-entrained concrete, within 0.5 percent of maximum allowable air content. The temperature of concrete used in trial batches shall not exceed the maximum temperature specified.
 - 3. For each water-cement ratio, at least three confirmation compression test cylinders for each test age shall be made and cured in accordance with ASTM C192. Confirmation cylinders shall be tested at seven (7) and 28 days in accordance with ASTM C39.
 - 4. From the results of the 28 day confirmation tests, a curve shall be plotted showing the relationship between the water-cement ratio and compressive strengths. From this curve, the water-cement ratio to be used in the concrete shall be selected to produce the average strength required.
 - 5. The cement content and mixture proportions to be used shall be such that this water-cement ratio is not exceeded when slump is the maximum permitted. Control in the field shall be based upon maintenance of proper cement, water content, slump and air content.
 - 6. Mix designs furnished by the concrete supplier, shall be based on the standard deviation analysis of previous test records meeting the requirements of Section 5.3.1 - Standard deviation of ACI 318. These mixes will be accepted in lieu of trial mixtures described in paragraphs above.
 - a. Temperature of concrete in test data shall be within 5 degrees F of maximum temperature specified for this project.
 - b. Strengths indicated in test data shall be in accordance with ACI 318, Section 5.3.
 - c. The specified strength of concrete used in supporting test data shall vary no more than 500 PSI plus or minus from that specified for this project.
 - d. The Testing Laboratory shall keep a strength and standard deviation record of all concrete for the duration of the project as specified in this section.

PART 3 - EXECUTION

3.1 GENERAL

- A. Inserts: Give the various trades and subcontractors ample notification and opportunity to furnish all anchors, nailers, pipes, conduits, boxes, inserts, thimbles, sleeves, frame vents, wires, supports, or other items required to be built into the concrete by the provisions of the Drawings or of the Specification governing the work of such trades and subcontractors, or as it may be necessary for the proper execution of their work. Obtain suitable templates or instructions for the installation of such items which are required to be placed in the forms.
- B. Install under-slab vapor retarder as instructed by manufacturer in accordance with ASTM E1643. Penetrations shall be sealed to maintain integrity of barrier. Tape around all openings and seal

all penetrations as instructed by the barrier manufacturer. Grade stakes shall not be driven through the vapor barrier. Avoid punctures during reinforcement and concrete placement.

- C. Slump:
1. Concrete not containing a high range water reducing admixture shall not be placed when its plasticity, as measured by slump test, is outside the following limits:
 - a. Footings: 5 inches maximum, 4 inches minimum
 - b. All other Structural Concrete: 5 inches maximum, 4 inches minimum
 - c. Slump drop not to exceed 2 inches when pumped.
 2. Concrete containing a high range water reducing admixture shall not be placed when its plasticity, as measured by slump test, is outside the following limits:
 - a. Prior to addition high range water reducer: 3 inches maximum, 2 inches minimum.
 - b. After addition of high range water reducer: 9 inches maximum.
- D. Classes of Concrete and Usage: Concrete of the several classes of concrete required shall have the characteristics shown on the Drawings.
- E. Mixing:
1. Transit-mixed concrete conforming to the requirements of ASTM C94 and ACI 304 shall be used in lieu of concrete mixed at the job site. Concrete shall not be transported or used in any case after a period in excess of 90 minutes has elapsed after the introduction of water into the mixer.
 2. Indiscriminate addition of water to increase slump of concrete is prohibited. Add water only at the direction of the Testing Laboratory. No water shall be added which increases the water cement ratio of the concrete in excess of the water cement ratio indicated on the approved mix design. At the direction of the Inspection and Testing Laboratory the addition of a high range water reducing admixture may be used to retemper concrete.
 3. The agency supplying transit-mixed concrete shall have a plant of sufficient capacity and adequate transportation facilities, to assure continuous delivery at the rate required. The frequency of deliveries to the site of the work must be such as to provide for placing the concrete continuously throughout any one (1) pour.
- F. Conveying Concrete: Convey concrete from the mixer to the place of final deposit by methods which will prevent the separation or loss of the ingredients. Concrete to be conveyed by pumping shall be submitted to the Inspection and Testing Laboratory for evaluation for each class of concrete specified before being used. Test cylinders for pumped concrete shall be taken at the discharge end of the pumping equipment.
- G. Equipment for chuting, pumping, and pneumatically conveying concrete shall be of such size and design as to assure a practically continuous flow of concrete at the delivery end without separation of the materials. The use of gravity-flow or aluminum chutes or conveyors for transporting concrete horizontally will not be permitted.
- H. Miscellaneous Materials and Accessories: if not specifically noted, install all materials and accessories per manufacturer's instructions as if noted here in full.
- I. Extend underslab vapor barrier continuously under entire slab, slab turn downs, vertical face of grade beams and footings to completely protect concrete adjacent to earth. Overlap joints and install seam tape and pipe boots, and seal penetrations as instructed by manufacturer.
- J. Bars shall be supported on chairs or spacers on metal hangers, accurately placed and securely fastened to steel reinforcement in place. No wood or clay brick will be permitted inside forms.
- K. All reinforcing shall be set in place, spaced, and rigidly and securely tied or wired at all splices and at all crossing points and intersections.
- L. Minimum center to center distance between parallel bars shall be in accordance with the details on the drawings. Where not shown, the clear spacing shall be 1-1/2 times the bar diameter but never less than 1-1/2 inches.
- M. Lap of splices where shown and noted on the drawings shall be a minimum of 32 bar diameters but never less than 12 inches.
- N. Except where shown on the drawings, minimum concrete coverage for reinforcing steel shall be:
- 1) 3 inches...where concrete is placed against earth
 - 2) 1-1/2 inches...over column ties
 - 3) 1-1/2 inches...for #5 and smaller bars in formed walls

- 4) 2 inches...for all bars larger than #5 in formed walls
- 5) 1 inch...for #11 and smaller bars in suspended slabs
- 6) 1-1/2 inches...for all bars larger than #11 in suspended slabs

3.2 CONCRETE CONTROL AND TESTING

- A. Inspection and Testing Laboratory Services.
- B. Except as noted below, all inspection and testing related to concrete placement, including reinforcing and embedded items, shall be the responsibility of the Owner. The Owner will directly engage the services of a qualified Testing and Inspection Laboratory, however, the Contractor shall provide access to the Owner's consultant, and, if required, the Contractor shall provide patching and repairing of surfaces removed to facilitate testing and inspection.
- C. Should the strength of concrete fall below the minimum, then additional tests, including load tests, may be required. These tests, if required, shall be made at the Contractor's expense and shall be in accordance with ASTM C42 and ACI 318. If tests do not meet the applicable requirements, then the structure, or any part of the structure, shall be removed and replaced at the Contractor's expense.
- D. Any concrete testing requested by the Contractor for early formwork or shoring removal, etc., shall be at the Contractor's expense.
- E. Do not permit placement of concrete having a measured slump outside limits given on Drawings or Specifications, except when approved by Architect/Engineer.

3.3 PLACING CONCRETE

- A. Place concrete in reasonably uniform layers, approximately horizontal, and not more than 18 inches deep, exercising care to avoid vertical joints or inclined planes. The piling up of concrete in the forms in such a manner as to cause the separation or loss of any of its ingredients will not be permitted. Concrete which has partially set or hardened shall not, under any circumstances, be deposited in the work. All slabs shall be placed for full thickness in one operation without change in proportions, screeded to proper elevation, and floated. Dusting of surfaces with cement is prohibited.
- B. Place concrete in the forms as nearly in its final position as is practical to avoid rehandling. Exercise special care to prevent splashing the forms or reinforcement with concrete. Remove any hardened or partially hardened concrete which has accumulated on the forms or reinforcement before the work proceeds. Do not place concrete on previously deposited concrete which has hardened sufficiently to cause the formation of seams or planes of weakness within the respective member of section, except as hereinafter specified.
- C. Do not permit concrete to drop freely any distance greater than five (5) feet. Where longer drops are necessary, use a chute, tremie, or other acceptable conveyance to assist the concrete into place without separation. Do not pour directly into any excavations where water is standing.
- D. Vibration: As soon as concrete is deposited, thoroughly agitate same by means of mechanical vibrators and suitable hand tools, so manipulated as to work the mixture well into all parts and corners of the forms, and entirely around the reinforcement and inserts. Mechanical vibrators shall maintain frequencies in accordance with the recommendations of ACI 309. Table 5.1.4, and shall be operated by competent workmen. Over vibrating and use of vibrators to transport concrete within forms shall not be allowed. A spare vibrator shall be kept on the job site during all concrete placing operations.
- E. Bonding: Before depositing any new concrete on or against previously deposited concrete which has partially or entirely set, the surface of the latter shall be thoroughly roughened and cleaned of all foreign matter, scum and laitance. The specified or an Architect approved bonding agent or epoxy adhesive shall be used.
- F. Construction Joints: Except as otherwise specifically indicated on the Drawings, each concrete member shall be considered as a single unit of operation, and all concrete for the same shall be placed continuously in order that such unit will be monolithic in construction. Should construction joints prove to be absolutely unavoidable, same shall be located at or near the midpoints of

- spans. Additional construction joints shall not be made under any circumstances without prior review by the Architect.
- G. Protect all freshly placed concrete from washing by rain, flowing water, etc. Do not allow the concrete to dry out from the time it is deposited in the forms until the expiration of the curing period.
 - H. Imperfect or damaged work, or any material damaged or determined to be defective before final completion and acceptance of the entire job, shall be satisfactorily replaced at the Contractor's expense and shall be in conformity with all of the requirements of the Contract Documents. Removal and replacement of concrete work shall be done in such a manner as not to impair the appearance or strength of the structure in any way.
 - I. Cleaning: Upon completion of the work, all forms, equipment, protective coverings and any rubbish resulting therefrom shall be removed from the premises. Finished concrete surfaces shall be left in clean and perfect condition, satisfactory to the Owner. Sweep with an ordinary broom and remove all mortar, concrete droppings, loose dirt, mud, etc.

3.4 FLOOR AND SLAB FINISHES

- A. Scratch Finish: Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds for tile, portland cement terrazzo, and other bonded applied cementitious finish flooring material, and as otherwise indicated.
 - 1. After placing slabs, surface shall be leveled to an $F_F 15 - F_L 13$ tolerance. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set, with stiff brushes, brooms or rakes.
- B. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing, or sand-bed terrazzo, and as otherwise indicated.
 - 1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture. Surface shall achieve an $F_F 20 - F_L 17$ tolerance.
- C. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed-to-view, and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or other thin film finish coating system.
 - 1. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final troweling operation, free of trowel marks, uniform in texture and appearance and to a $F_F 35/ F_L 30$ tolerance ($F_L 17$ for elevated slabs). Grind smooth surface defects, which would telegraph through applied floor covering system.
- D. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps and ramps, and elsewhere as indicated.
 - 1. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application. A sample panel is required.
- E. Liquid Densifier/Sealer: Apply liquid densifier/sealer on exposed interior floors subject to vehicular abrasion and as indicated on the Drawings. Compound shall be mechanically scrubbed into the surface in strict accordance with the directions of the manufacturer and just prior to completion of construction.

3.5 NON-SHRINK GROUT

- A. Refer to Structural Drawings for column base plates and other structural grouting requirements.
- B. Non-shrink grout shall be mixed only in such quantities as are needed for immediate use. No retempering shall be permitted and materials which have been mixed for a period exceeding 30 minutes shall in no case be used upon any portion of the work.

- C. Where high fluidity and/or increased placing time is required use the specified high flow grout. This grout shall be used for all base plates larger than ten (10) square feet.
- D. For every 1/3 cubic yards of grout placed, grout strength shall be tested with a set of cubes as follows:
 - 1. A set of cubes shall consist of three cubes to be tested seven (7) days, and three (3) cubes to be tested at 28 days.
 - 2. Test cubes shall be made and tested in accordance with ASTM C1107, Section 12.5, with the exception that the grout should be restrained from expansion by a top plate.

3.6 CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. All concrete shall be kept continuously moist and above 50 degrees F for seven days. When high early strength concrete is used this temperature requirement may be lowered to three (3) days.
- B. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing, and by combinations thereof, as herein specified.
 - 1. Provide specified curing compound to exposed interior slabs. This curing compound must be dissipating or easily removed in the cleaning process prior to the application of any liquid densifier/ sealer.

3.7 DEFECTIVE WORK

- A. Imperfect or damaged work, or any material damaged or determined to be defective before final completion and acceptance of the entire job, shall be satisfactorily replaced at the Contractor's expense and shall be in conformity with all of the requirements of the Contract Documents. Removal and replacement of concrete work shall be done in such a manner as not to impair the appearance or strength of the structure in any way.

3.8 CLEANING

- A. Upon completion of the work, all forms, equipment, protective coverings and any rubbish resulting there from, shall be removed from the premises. Finished concrete surfaces shall be left in clean and perfect condition, satisfactory to the Owner. Sweep with an ordinary broom and remove all mortar, concrete droppings, loose dirt, mud, etc.

3.9 REPAIR OF DEFECTIVE AREAS

- A. With prior approval of the Architect/Engineer, as to method and procedure, all repairs of defective areas shall conform to ACI 301, Section 5.3.7, using the polymer repair mortars and/or epoxy adhesives furnished by The Euclid Chemical Company, Sika Chemical Corp., or Architect approved equal.

3.10 FIELD QUALITY CONTROL AND TESTING

- A. An Independent Testing Agency will perform Inspection and Testing.

END OF SECTION 03 30 00

SECTION 03 39 00

CONCRETE CURING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Initial and final curing of horizontal and vertical concrete surfaces.

1.2 RELATED REQUIREMENTS

- A. Section 03 30 00 – Cast-in-Place Concrete.

1.3 REFERENCE STANDARDS

- A. ACI 301 – Specifications for Structural Code for Buildings; American Concrete Institute International; 2005.
- B. ACI 302.1R – Guide for Concrete Floor and Slab Construction; American Concrete Institute International; 2004 (Errata 2007)
- C. ACI 308R - Guide to Curing Concrete; American Concrete Institute International; 2001 (Reapproved 2008)
- D. ASTM C 171 – Standard Specification for Sheet Materials for Curing Concrete; 2007.
- E. ASTM C 309 – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2007.

1.4 SUBMITTALS

- A. See Section – Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on curing compounds and moisture-retaining sheet, including compatibility of different products and limitations.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301 and ACI 302 1R.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver curing materials in manufacturer's sealed packaging, including application instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Membrane Curing Compound: ASTM C 309 Type 1 – Clear or translucent, Class A
- B. Moisture-Retaining Sheet: ASTM C 171.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to be cured.

3.2 EXECUTION-HORIZONTAL SURFACES

- A. Cure floor surfaces in accordance with ACI 308R.

3.3 EXECUTION-VERTICAL SURFACES

- A. Cure surfaces in accordance with ACI 308R.

3.4 PROTECTION

- A. Do not permit traffic over unprotected floor surface.

END OF SECTION 03 39 00

SECTION 05 12 00**STRUCTURAL STEEL****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Labor, materials, services, equipment, and appliances required in connection with or incidental to furnishing, fabricating, delivering, and erecting structural steel complete, as described in this Section, shown on Drawings, or reasonably implied therefrom, including, but not limited to:
 - 1. Structural steel columns, girders, beams, and angles
 - 2. Angle frames for openings in floors and roofs
 - 3. Steel plates and miscellaneous deck support angles
 - 4. Connections and component parts
 - 5. Qualification of welders employed on the Project
 - 6. Galvanizing of items
 - 7. Shop prime coat painting and field touch-up painting
 - 8. Grouting of base plates
 - 9. Temporary bracing of construction
 - 10. Fabrication/erection inspection and testing
- B. Extent of structural steel work is shown on the Structural Drawings, including schedules, notes and details to show sizes and locations of members, typical connections and types of steel required.
- C. Include all supplementary parts and members necessary to complete the structural steel work, regardless of whether such parts and members are definitely shown or specified, and furnish all such gussets, plates, bolts, nuts, washers, welds, etc. as may be required for the proper assembly of all items. Include miscellaneous deck support angles as required for the proper support of metal floor deck around columns, gussets, openings and obstructions, and proper support of metal roof deck around openings, obstructions, and where required.

1.2 RELATED REQUIREMENTS

- A. Section - Testing and Inspecting Services

1.3 RELATED WORK

- A. Section 03 30 00 - Cast-In-Place Concrete: Installation of anchor bolts.
- B. Section 04 20 00 - Unit Masonry: Furnishing masonry anchors to be attached to structural steel.
- C. Section 05 21 00 - Open Web Steel Joists and Joist Girders.
- D. Section 05 31 00 - Steel Deck.
- E. Section - Light Gauge Steel Framing.
- F. Section 05 50 00 - Miscellaneous Metals.
- G. Section - Sprayed Fireproofing.
- H. Section - Painting and Staining: Finish painting of exposed structural steel.

1.4 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. A 6, Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
 - 2. A 36, Standard Specification for Carbon Structural Steel
 - 3. A 53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
 - 4. A 108, Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
 - 5. A 123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - 6. A 153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - 7. A 307, Standard Specification for Carbon Steel Bolts and Studs 6000 psi Tensile

8. A 325, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
9. A 490, Standard Specification for Structural Bolts, Steel, Heat-Treated, 150 ksi (1035 Mpa) Tensile Strength
10. A 500, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
11. A 578, Standard Specification for Straight-Beam Ultrasonic Examination of Plain and Clad Steel Plates for Special Applications
12. A653, Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process
13. A780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
14. A897, Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on each surface
15. A 992, Standard Specification for Structural Steel Shapes
- B. American Institute for Steel Construction (AISC)
 1. Code of Standard Practice for Steel Buildings and Bridges
 2. Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings, latest edition
 3. Specifications for Structural Joints Using ASTM A 325 or A 490 Bolts, approved by the Research Council on Structural Connections of the Engineering Foundation
 4. Specification for Architecturally Exposed Structural Steel
 5. Structural Welding Guide, AWS D1.1
- C. American National Standards Institute (ANSI)
 1. Standards
- D. American Welding Society (AWS)
 1. D1.1 Structural Welding Code
- E. Corps of Engineers (CE)
 1. CRD-C 621
- F. Industrial Fasteners Institute (IFI)
 1. Handbook on Bolt, Nut, and Rivet Standards
- H. Steel Structures Painting Council (SSPC)
 1. Painting Manual, Volume 1, Good Painting Practice
 2. Painting Manual, Volume 2, Systems Specifications

1.5 QUALITY ASSURANCE

- A. All standards referenced in this Section shall apply, as applicable to the work, unless noted otherwise. In case of conflict between the Contract Documents and a referenced standard, the Contract Documents shall govern. In case of conflict between the Contract Documents and the Building Code, the more stringent requirement shall govern.
- B. Contractor shall furnish fabrication/erection inspection and testing of all welds in accordance with AWS D1.1, Chapter 6. Submit records of inspections and tests to Owner's testing laboratory for their review.
- C. An Independent Testing Agency will perform Inspection and Testing.
- D. All materials, fabrication procedures and field are subject to verification inspection and testing by the Owner's testing laboratory, in both shop and field. Such inspections and tests will not relieve the Contractor of his responsibility for providing materials and fabrication procedures in compliance with specified requirements. Owner reserves the right to use ultrasonic or radiographic inspection to verify the adequacy of all welds. Testing procedures and acceptance criteria shall be as specified in AWS D1.1. Promptly remove and replace materials or fabricated components which do not comply.
- E. Qualifications for Welding Work: Contractor shall be responsible for qualifying welding operators employed on the Project in accordance with AWS Standard Qualification Procedure. Provide certification to Owner's testing laboratory that welder's have satisfactorily passed AWS qualification tests in the previous 12 months. Retesting and recertification of welders, if required, is the Contractor's responsibility.

- F. Qualifications for Welding Procedures: Contractor shall provide the testing laboratory with welding procedures which are to be used in executing this work. Welding procedures shall be qualified prior to use in accordance with AWS D1.1, Part B.
- G. Comply with provisions of referenced codes, specifications, and standards, in addition to the Building Code.
- H. Fabricator's Qualifications:
 - 1. Company specializing in the fabrication of structural steel for buildings with minimum of five (5) years experience and currently certified by AISC or IAS Quality Certification Program.

1.6 DESIGN

- A. Connections: Shall be designed in accordance with the requirements on the Structural Drawings.
- B. Fabricator shall be responsible for all errors of detailing, fabrications, and for correct fitting of structural steel members.

1.7 SUBMITTALS

- A. Product Data: Submit producer's or manufacturer's specifications and installation instructions, including laboratory test reports and other data, to show compliance with Specifications for the following products:
 - 1. Structural steel primer and touch-up paint.
 - 2. Shrinkage-resistant grout.
- B. Mill Certificates: Submit manufacturer's mill analysis, for Architect's record, showing compliance with Specifications for the following products:
 - 1. Structural steel (each type)
 - 2. High-strength bolts (each type), including nuts and washers.
- C. Shop Drawings:
 - 1. Submit design calculations for the connections designed by the Contractor, prior to or with the shop drawings. Calculations shall bear the seal of a Registered Professional Engineer, licensed in the State of Texas. Shop drawings containing connections for which calculations have not been received will be returned unchecked as an incomplete submittal. Design Calculations will be retained for the Architect's file, and will not be approved or returned. Design calculations shall include the following:
 - a. All structural steel beam connections not specifically detailed on the Structural Drawings shall be designed by the Contractor, under the direct supervision of a Registered Professional Engineer, licensed in the State of Texas. Connections shall be designed to resist the forces specified on the Structural Drawings and shall be shown in detail on the shop drawings.
 - b. Wind Brace Connections: Calculations shall be given for each different wind brace connection used and detailed on the shop drawings. Each connection calculation shall identify the location or locations for which the connection applies by indicating the following:
 - 1) the wind brace mark(s) from the Structural Drawings;
 - 2) the piece mark(s) from the shop drawings;
 - 3) the member size, and
 - 4) the design loading(s)
 - 2. Submit shop drawings prepared under the supervision of a Registered Professional Engineer, licensed in the State of Texas, including complete details and schedules for fabrication and shop assembly of members, erection plans, details, procedures, and diagrams showing sequence of erection. Include details of cuts, connections, camber holes, and other pertinent data. Indicate welds by standard AWS symbols, and show size, length, and type of each weld. Shop drawings shall not be produced by using reproductions of Contract Documents.
 - a. Structural steel members for which shop drawings have not been reviewed shall not be fabricated. Architect's review shall cover general locations, spacings, and

details of design. Omission from shop drawings of any materials required by the Contract Documents shall not relieve the Contractor of his responsibility for furnishing and installing such materials, even though such shop drawings may have been reviewed and returned.

- b. Substitutions: Submit substitutions of sections or modifications of details, or both, and the reasons therefore, along with shop drawings for Architect's approval. Submitted substitutions must be clearly identified and noted as such. Approved substitutions, modifications, and necessary changes in related portions of the work shall be coordinated by the fabricator and shall be accomplished at no additional expense to the Owner.
- D. Setting Drawings and Templates: Submit setting drawings, templates, and directions for installation of anchor bolts and other anchorages installed by other trades.
- E. Certifications:
 - 1. Submit evidence of current AISC or IAS plant certification. Refer Fabricator's Qualifications under Quality Control.
 - 2. Submit welder's certification to Owner's testing laboratory. Refer Qualifications for Welding Work under Quality Control.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time so as to not delay that work.
- B. Deliver packaged materials in the manufacturer's original unopened packaging, store and handle steel joists in accordance with SJL recommendations. Protect packaged materials from corrosion and deterioration.
- C. Store materials to permit easy access for inspection and identification. Keep steel members off the ground, using pallets, platforms, or other means of support. Protect steel members from corrosion and deterioration.
- D. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed at no additional expense to Owner.
- E. Support cambered members during shipment and handling in a manner which will not result in loss of camber.

1.9 PROJECT CONDITIONS

- A. Coordinate erection of structural steel with work of other trades.
- B. Do not install columns which have anchor bolts in concrete, until concrete members have attained their 28 day compressive strength.

1.10 PRE-INSTALLATION CONFERENCE

- A. Refer to Section – Project Coordination.

PART 2 - PRODUCTS

2.1 APPROVED MANUFACTURERS

- A. Specifications are based on the named product(s) and manufacturer(s). Except where specifically stated as no substitutions, other products must be by a manufacturer having a minimum of five (5) years experience manufacturing product(s) meeting or exceeding the specifications, comply with requirements of this Section, and Division 1 requirements for substitutions in order to be considered.

2.2 MATERIALS (As shown or required)

05 12 00 STRUCTURAL STEEL

- A. Metal Surfaces, General: For fabrication of work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names, and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating, and application of surface finishes.
- B. Steel:
 - 1. Wide Flange (W) Shapes and Tees: ASTM A 992 (50 ksi yield).
 - 2. Other Rolled Shapes, Plates, and Bars: ASTM A 36 (36 ksi yield).
 - 3. Cold Formed Steel Tubing: ASTM A 500, Grade B (46,000 psi yield).
 - 4. Steel Pipe: ASTM A 501, Type E or S, Grade B.
- C. Bolts, Nuts, and Washers:
 - 1. Bolts: Anchor bolts and erection bolts shall conform to ASTM A 307 Grade A, and to the requirements for regular hexagon bolts and nuts of ANSI B18.2.1 and ANSI B18.2.2.
 - 2. High-strength bolts for connections shall conform to ASTM A 325 or ASTM A 490. Dimensions of bolt heads and nuts shall conform to requirements for heavy hexagon nuts of ANSI B18.2.1 and ANSI B18.2.2.
 - 3. Washers: Circular washers shall be flat and smooth, shall conform to requirements of Type A washers in ANSI B23.1. Beveled washers for "S" shapes and channels shall be square or rectangular, shall taper in thickness, and shall be smooth. Washers for use with high-strength bolts shall be hardened.
 - 4. Tension Control Bolts: May, at Contractor's option, be used in lieu of conventional high-strength bolts. Bolts shall be furnished by one (1) of the following:
 - a. LeJeune Bolt Company, Lakeville, Minnesota
 - b. Lohr Structural Fasteners, Inc., P. O. Box 1387, Humble, Texas.
 - 5. Drilled Anchor Bolts: Shall be one (1) of the following (No substitutions):
 - a. Wej-it Bolt, Wej-it Corporation, Tulsa, Oklahoma
 - b. Kwik Bolt, Hilti Fastening Systems, Tulsa, Oklahoma
 - c. Trubolt, Ramset Fastening Systems, Paris, Kentucky
- D. Welding Electrodes: Shall conform to the requirements and specifications of AWS. Use E70 electrodes. For high-strength, low-alloy steel, provide electrodes, welding rods, and filler metals equal in strength and compatible in appearance with parent metal joined.
- E. Shear Studs: Shall be shear connectors with proper ferrules and accessories, especially designed to create composite deck action between concrete deck and the supporting beam. Steel for studs shall conform to ASTM A108, Grades 1015-1020, with a minimum tensile strength of 60,000 psi. Studs shall be of uniform diameter, heads shall be concentric and normal to shaft and the weld end shall be chamfered, welds shall be solid flux.
- F. Primer and Touch-Up Paint:
 - 1. For Standard Shop Coat: Red oxide primer, meeting the requirements of SSPC-Paint 25. Refer to items below which shall not receive paint/primer. Zinc Chromate not permitted.
 - 2. For Architecturally Exposed Steel Members: First coat Tnemec-Zinc 90-97 and second coat Tnemec Series 66, Hi-Build Epoxoline; or PPG No. 97-670 Zinc Primer with second coat of PPG No. 97-130 HB Epoxy; or Architect approved equal; in color selected by Architect.
 - 3. For Field Touch-Up: Same paint as specified for shop primer coat.
 - 4. Galvanizing: When galvanized steel is required, conform to the following:
 - a. Steel: Provide zinc-coating to conform to ASTM A 123.
 - b. Threaded Products: Provide zinc-coating to conform to ASTM A 153, Class C.
 - c. Steel Sheet: Provide zinc-coating to conform to ASTM A 897.
- G. Galvanizing Repair Paint: ZRC Cold Galvanizing Compound or Galvilite manufactured by ZRC Worldwide, Marshfield, MA; Galvax Zinc-rich Cold Galvanizing Coating manufactured by Alvin Products, Inc., Lawrence, MA; or paint complying with military specification MILP-21035A, Type I or II. Apply repair paint in accordance with ASTM A780.
- H. Slide Bearings: Reinforced teflon, factory pre-bonded to steel plates with initial static coefficient of friction not exceeding 0.06 at the interface, over a working stress range of 500 to 2000 psi. Bearing shall be one (1) of the following:

1. "Fluorogold" slide bearings manufactured by the Fluorocarbon Company, Pine Brook, New Jersey.
 2. "Con-Slide" slide bearings manufactured by Con-Serv, Inc. East Hampton, New Jersey.
- I. Shrinkage-Resistant Grout:
1. Type: Premixed, nonshrink, nonmetallic grout, ASTM C1107.
 2. Applicable Standards: Corps of Engineers CRD-C 621, with the following exceptions:
 - a. Provide a maximum initial set time of 1 hour at 73.4F (+ 5F) and 50% RH.
 - b. Minimum compressive strength at 28 days shall be 8,000 psi when placed at fluid consistency.
 - c. Expansion shall not be formed by gas liberation.
 3. Approved Manufacturers: Specifications are based on first named manufacturer. Other approved manufacturers must meet or exceed this standard.
 - a. "Supreme", Gifford-Hill & Company, Inc., Dallas, Texas 75247 (214) 258-7000.
 - b. "Masterflow 713", Master Builders Division of Martin Marietta, Cleveland, Ohio 44122 (216) 831-5500.
 - c. "Saureisen F-100", Sauereisen Cements Co., Pittsburgh, Pennsylvania 15238 (412) 963-0303.

2.3 FABRICATION

- A. Shop Fabrication and Assembly:
1. Fabricate and assemble structural assemblies in the shop to the greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings.
 2. Provide camber in members where indicated. Specified camber applies as at jobsite, just prior to erection, lying down flat so that member weight has no effect. Contractor shall take necessary precautions to prevent or compensate for camber loss during shipment. Measured camber in members up to 50 feet-0 inches long shall be within a tolerance of minus 1/2 inch to plus zero from the amount specified. For members greater than 50 feet-0 inches long, both positive and negative tolerance may increase 1/8 inch for every 10 feet-0 inches of length in excess of 50 feet-0 inches. Members with a field measured camber outside of the specified tolerance shall be returned to the shop.
 3. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.
 4. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.
 5. Splicing of structural steel members is prohibited without prior approval of Architect. Any member having a splice not shown or detailed on approved shop drawings will be rejected.
 6. Plates shall be free of gross internal discontinuities such as ruptures and delaminations. Plates shall comply with ASTM A 578, Level 1.
 7. Mill Tolerances: Comply with ASTM A 6.
 8. Fabrication Tolerances: Comply with AISC Code of Standard Practice.
- B. Connections:
1. Weld or bolt shop connections as indicated on the Drawings.
 2. Bolt field connections, except where welded connections or other connections are indicated. Provide specified threaded fasteners for all principle bolted connections. Holes for bolted connections shall be drilled or punched at right angles to member. The slope of surfaces under the bolt head and nut shall not exceed 1:20. Provide beveled washers where slopes exceed 1:20. Bolt holes shall have a diameter not greater than 1/16 inch larger than the nominal bolt diameter. Do not flame cut holes or enlarge holes by burning. Provide washers over all slotted holes in an outer ply.
 3. High-Strength Bolted Construction: Install high-strength threaded fasteners in accordance with AISC, "Specifications for Structural Joints Using ASTM A 325 or A 490 Bolts", approved by the Research Council on Structural Connections of the Engineering Foundation.

4. Welded Construction: Comply with AWS D1.1 for procedures, appearance and quality of welds, and methods used in correcting welding work. Assemble and weld built-up sections by methods which will produce true alignment of axis without warp. Welds not specified shall be continuous fillet welds designed to develop the full strength of member. No combination of bolts and welds shall be used for stress transmission at the same face of any connections.
5. Clean completed welds prior to inspection. Slag shall be removed from all completed welds and the weld and adjacent base metal shall be cleaned by brushing or other suitable means. Tightly adherent splatter remaining after the cleaning operation is acceptable unless its removal is required for the purpose of nondestructive testing.
6. For high-strength, low-alloy steels, follow welding procedures recommended by steel producer for exposed and concealed connections.
7. Base Plates: Hole sizes for anchor bolts may be oversized to facilitate erection as follows:
 - a. Bolts 3/4 inch to 7/8 inch Diameter: 5/16 inch oversize
 - b. Bolts 1 inch to 2 inches Diameter: 1/2 inch oversize
 - c. Bolts over 2 inches Diameter: 1 inch oversize

Use oversize or plate washers under nut at all oversized holes in base plates. Washers must be large enough to cover the entire hole. Washer thickness shall be at least 1/8 of bolt diameter.

- C. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Shop weld shear connectors, shaped as shown, to beams and girders in composite construction which do not support metal deck. Use automatic end welding of headed stud shear connectors in accordance with manufacturer's printed instructions.
 1. Installation of Shear Connectors: Shear studs shall be automatically end welded in the shop in accordance with Article 31 of the AWS Structural Welding Code and the specifications of the shear stud manufacturer. After installation, each ceramic ferrule shall be removed prior to placement of concrete. Adequate welding power must be available for studs being welded.
 2. All areas to which studs are to be attached shall be cleaned of all rust, oil, grease, and paint. When the mill scale is sufficiently thick to cause difficulty in obtaining proper welds, it shall be removed by grinding or sand blasting.
- D. Holes for Other Work: Provide holes required for securing other work to structural steel framing and for passage of other work through steel framing members, as shown on final shop drawings. Provide threaded nuts welded to framing and other specialty items as indicated to receive other work. Cut, drill or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.
- E. Galvanized (Zinc-Coating): All structural steel pieces, exposed to weather or moisture, in permanent contact with soil, or accessible to salt intrusion shall be hot dipped galvanized in accordance with ASTM A123, including, but not limited, to the following:
 1. Exterior exposed steel columns and beams.
 2. Exterior non-conditioned exposed steel under cover.
 3. Masonry shelf angles.
 4. Exterior exposed railings.
 5. Miscellaneous structural metals placed in concrete.
 6. Items shown on Drawings or required.
- F. Architecturally Exposed Structural Steel: All exposed structural steel shall be straight and true. Select or straighten members to meet permissible variations of ASTM A6, subject to tolerances of AISC Code of Standard Practice, Chapter 10. Exposed surfaces shall be smooth, free of embedded scale, trademarks, roll imperfection marks, and other irregularities. Fill depressions of whatever kind with weld metal of the same composition as the parent metal. Grind welds and raised marks smooth and flush with adjacent surfaces.

2.4 SHOP PAINTING

- A. General: Shop paint structural steel, those members or portions of members except as follows:
 - 1. to receive a galvanized coating,
 - 2. to be embedded in concrete or mortar,
 - 3. surfaces which are to be welded,
 - 4. to receive sprayed-on fireproofing, and
 - 5. specifically noted as not shop prime painted
- B. Surface Preparation: After inspection and before shipping, clean steel work to be painted. Remove loose rust, loose mill scale, splatter, and slag or flux deposits. Clean steel in accordance with SSPC recommendations as follows:
 - 1. For exposed steel in conditioned spaces: SP-3, "Power Tool Cleaning".
 - 2. For exterior exposed steel: SP-6, "Commercial Blast Cleaning".
- C. Painting: Immediately after surface preparation, apply structural steel primer paint in accordance with manufacturer's instructions and a rate to provide following dry film thickness. Use painting methods which result in full coverage of joints, corners, edges, and exposed surfaces.
 - 1. For Standard Shop Coat: Apply specified primer to 2.0 mils.
 - 2. For Architecturally Exposed Steel Members: Apply first coat specified primer to 3.5 mils and second coat specified primer to 4 to 6 mils.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Erector must examine areas and conditions under which structural steel work is to be installed, and notify Contractor of conditions detrimental to proper and timely completion of work.

3.2 ERECTION

- A. General: Comply with AISC Specifications and Code of Standard Practice, and as herein specified.
- B. Temporary Shoring and Bracing:
 - 1. Provide adequate shoring and bracing to safely withstand all loads to which the structure may be subjected during the construction process, including wind loads, dead loads, construction material, and equipment loads. Such bracing shall remain in place as long as required for safety.
 - 2. As the erection progresses, make a sufficient number of permanent welded or bolted connections to withstand erection stresses and maintain stability.
 - 3. The design of temporary shoring and bracing shall be the responsibility of the Contractor.
- C. Temporary Planking: Provide temporary planking and platforms, as necessary, to effectively complete the work.
- D. Anchor Bolts: Furnish anchor bolts and other connectors required for securing structural steel to foundations and other in-place work. Furnish templates and other devices necessary for presetting bolts and other anchors in accurate locations. Refer to Section 03 30 00, Cast-In-Place Concrete for anchor bolt installation requirements in concrete, and Section 04 20 00, Unit Masonry for anchor bolt installation requirements in masonry.
- E. Field Assembly:
 - 1. Set structural frames accurately to the lines and elevations indicated.
 - 2. Align and adjust various members forming a part of a complete frame or structure before permanently fastening members together.
 - 3. Clean bearing surfaces and other surfaces before assembly which will be in a permanent contact, before assembly.
 - 4. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

5. Level and plumb individual members to structure within tolerances defined by AISC Code for Standard Practice, unless closer tolerances are required for proper fitting of adjoining or enclosing materials, in which case the most stringent shall apply.
 6. Set horizontal members with their natural camber (or specified camber) up.
 7. Splice members only where indicated and accepted on final shop drawing.
 8. Where parts cannot be assembled or fitted properly, as a result in errors in fabrication or of deformation due to handling or transportation, such condition shall be immediately reported to the Architect, along with proposed method of correction. The straightening of bends or warps shall be performed by approved methods. Bent or damaged heat-treated parts will be rejected.
 9. Do not enlarge unfair holes in members by burning or by the use of drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts and weld connection continuously.
 10. Do not use gas-cutting torches in the field for correcting fabrication errors in the structural framing, except on secondary members, which are not under stress. Finish gas-cut sections equal to a sheared appearance.
- F. Erection Bolts:
1. On exposed welded construction, remove erection bolts, fill holes with plug welds, and grind smooth at exposed surfaces.
 2. On non-exposed welded construction, erection bolts shall be tightened securely and left in place, or if removed, the holes shall be filled with plug welds.
- G. Bolted Connections:
1. High-strength bolts shall be installed in accordance with AISC, "Specifications for Structural Joints Using ASTM A 325 or A 490 Bolts".
 2. ASTM A 307 bolts and high-strength (ASTM A 325 and ASTM A 490) bolts noted to be "snug-tight" shall be tightened using a few impacts of an impact wrench or the full effort of a man using an ordinary spud wrench, bringing the plies into snug contact.
 3. Bolted parts shall fit solidly together when assembled. All joint surfaces shall be free of burrs, dirt and other foreign material that would prevent solid seating of the parts.
 4. Hardened washers shall be placed over slotted holes in an outer ply. Hardened beveled washers shall be used where outer face of bolted parts has a slope greater than 1:20 with respect to bolt axis.
- H. Field Welding:
1. Comply with AWS D1.1 and AISC Specifications for Structural Steel Buildings. Pay particular attention to surface preparation, preheating, sequence, and continuity of welds.
 2. Where heavy shapes are to be welded, comply with all special requirements contained in the AISC Specifications and AWS D1.1.
 3. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
- I. Unfair Holes:
1. Do not enlarge holes in members, by burning or by use of drift pins, except in secondary bracing members.
 2. Ream holes that require enlarging to admit bolts.
- J. Gas Cutting:
1. Do not use gas cutting torches in field for correcting fabrication errors in structural framing
 2. Cutting will be permitted only on secondary members which are not under stress, as acceptable to the Architect.
 3. Finish gas-cut sections equal to a sheared appearance when permitted.
- K. Setting Bases and Bearing Plates:
1. Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean the bottom surface of base and bearing.
 2. Set loose and attached base plates and bearing plates for structural members on wedges, or other adjustable devices.
 3. Tighten the anchor bolts after the supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with the edge of the base or bearing plate prior to placing grout.

4. Mix and place grout in accordance with the manufacturer's instructions.
 5. Place grout solidly between bearing surfaces and bases or plates to ensure that no voids remain.
 6. Finish exposed grout surfaces.
 7. Protect installed materials, and allow grout to cure in accordance with manufacturer's instructions.
- L. Field Touch-Up Painting:
1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint.
 2. Apply paint to exposed areas with same materials as used for shop painting.
 3. Apply by brush or spray, to provide a minimum dry film thickness of 2.5 mils for each coat.

3.3 CLEANING

- A. Clean up all debris caused by the Work of this Section, keeping the area clean and neat at all times.

END OF SECTION 05 12 00

SECTION 05 50 00**MISCELLANEOUS METALS****PART 1 - GENERAL****1.1 SECTION INCLUDES**

- A. Miscellaneous metal items and their related components, which are not necessarily individually described, shall be furnished and installed in accordance with the intent of the drawings and specifications and as required to complete the work.
- B. The Work of this Section is governed by Section 05 12 00, Structural Steel, except where more stringent requirements are contained herein or on the Structural Drawings. If a conflict exists, notations on the Structural Drawings take precedence.

1.2 REFERENCES

- A. Conform to the following reference standards as applicable to the work:
 - 1. American Institute of Steel Construction (AISC), Code of Standard Practice for Steel Buildings and Bridges, latest edition.
 - 2. American Institute of Steel Construction (AISC), Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings, latest edition.
 - 3. American Iron and Steel Institute (AISI)
 - 4. ASTM International (ASTM)
 - a. A36, Standard Specification for Carbon Structural Steel
 - b. A108, Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
 - c. A123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - d. A126, Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
 - e. A307, Standard Specification for Carbon Steel Bolts and Studs 60,000 psi Tensile Strength
 - f. B209, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
 - g. B210, Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes
 - h. B221, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
 - 5. American Welding Society (AWS)
 - a. D1.1 Structural Welding Code
 - 6. Steel Structures Painting Council (SSPC)
 - a. Painting Manual, Volume 1, Good Painting Practice
 - b. Painting Manual, Volume 2, Systems Specifications
 - 7. National Ornamental & Miscellaneous Metals Association (NOMMA)
 - a. Guideline 1 – Joint Finishes.

1.3 SUBMITTALS

- A. Shop Drawings:
 - 1. For off-the-shelf items: Show all layouts, sizes, methods of construction and installation, including sizes and types of all fastening devices.
 - 2. For custom fabricated items: Submit design calculations for the materials and their connections designed by the Contractor, prior to or with the shop drawings. Calculations shall bear the seal of a Registered Professional Engineer, licensed in the State of Texas. Shop drawings containing connections for which calculations have not been received will be returned unchecked as an incomplete submittal. Design Calculations will be retained for the Architect's file, and will not be approved or returned.
- B. Samples: As noted.

1.4 CONTRACTOR'S RESPONSIBILITIES

- A. As scope and performance documents, the Drawings and Specifications do not necessarily indicate or describe all the work required for the performance and completion of the Work. Contracts will be let on the basis of such documents with the understanding that the Contractor shall furnish and install the items required for proper completion of the Work without adjustment to price or schedule. Work shall be of sound, quality construction and the Contractor shall be solely responsible for the inclusions of adequate labor and materials to cover the proper and timely fabrication and installation of the miscellaneous metal items indicated, described, or implied.
- B. As a performance specification, the criteria for the solution of structurally sound miscellaneous metal items indicated on the Drawings or specified herein are the sole purpose of defining the design intent and performance requirements. The details shown are intended to emphasize the acceptable profiles and performance requirements for this Project. To avoid any misunderstanding or lack of interpretation, the Contractor is hereby advised that the responsibility for the miscellaneous metal items are totally his and that designs and resolutions proposed in the Contractor's shop drawings, structural calculations, and related documentation shall be demonstrated throughout the Work and warranty period specified or required.
- C. Design proposal submissions which follow exactly the details indicated on the Drawings, will not relieve the Contractor of his responsibility for the design, fabrication, erection, or performance of the Work of this Section.
- D. In the event of a controversy over the design, the decision of the Architect will take precedence.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Structural Steel: Comply with ASTM A36.
- B. Welding:
 - 1. Comply with American Welding Society (AWS) Code.
 - 2. Comply with National Ornamental & Miscellaneous Metals Association (NOMMA Guideline 1: Joint Finishes) for joint finishes in the following locations:
 - a. Finish #1: Interior handrails and guardrails
 - b. Finish #2: Typical ornamental metals exposed to view, interior and exterior, except as indicated above. (canopies, exterior railings and guardrails, non-accessible sculptural fabricated metal, etc.)
 - c. Finish #3: Miscellaneous metals exposed interior non-public spaces, and exterior miscellaneous metals, except as indicated above. (ladders, bollards, etc.)
 - d. Concealed welding: no requirement, unless otherwise indicated or required for safety or conformance with requirements of other portions of the work.
- C. Bolts:
 - 1. Comply with ASTM A307.
 - 2. Size: 3/4 inch, unless otherwise noted.
- D. Anchors:
 - 1. Expansion bolts:
 - a. 1/4 inch or less, Rawl Calk-Ins or Arrow Series 4000.
 - b. Greater than 1/4 inch: Rawl Multi-Calks. Top shall be 1/2 inch below concrete surface.
 - 2. Molly screw anchors:
 - a. In walls 1/16 inch to 5/8 inch thick, use "S" length
 - b. In walls 5/8 inch to 1/4 inch thick, use "L" length
 - c. In walls 1-1/4 inch to 1-3/4 inch thick, use "XL": length.
 - 3. Nelson stud anchors:
 - a. Comply with ASTM A108.

- b. Concrete Embed: Headed, low carbon steel, non-threaded, galvanized, standard ferrule as required
- E. Shop Priming:
 - 1. Shop coat any ungalvanized ferrous metal with primer, except for those to receive application of spray-applied fireproofing shall be free of primer and paint.
 - 2. Clean iron and metal to be primed of scale, dirt and dust by steel scrapers, wire brushers or sandblasting. Remove oil and grease with petroleum naphtha.
 - 3. Thoroughly work paint into all joints by brush. Overall application of brush or spray coat of red oxide primer in accordance with SSPC - Paint 25.
 - 4. Give any painted built-in portions one field coat of primer on all abraded parts after installation.
- F. Galvanized Metal:
 - 1. Comply with ASTM A123.
 - 2. General: Galvanize all steel sections which are fully or partially exposed to weather, regardless if they are scheduled to receive a finish coat of paint or not.
 - 3. Galvanized items to be painted shall be primed as outlined in Painting and Staining Section.
 - 4. Hot-dip galvanized after fabrication.
 - 5. Silicone protective coating shall not be used at galvanized items scheduled to receive paint.
 - 6. Galvanizing Repair Paint: ZRC cold galvanizing compound or Galviline manufactured by ZRC Worldwide, Marshfield, MA; Galvax Zinc-rich Cold Galvanizing Coating manufactured by Alvin Products, Inc., Lawrence, MA; or paint complying with military specification MILP-21035A, Type I or II. Apply repair paint in accordance with ASTM A780.
- G. Stainless Steel:
 - 1. General: Comply with ASTM Standards as applicable to the work.
 - 2. Type: Type 302 or 304 as applicable to the work.
 - 3. Finish:
 - a. Concealed: No. 2D finish
 - b. Exposed: No. 4, unless noted otherwise.
- H. Aluminum:
 - 1. General: Comply with ASTM Standards as applicable to work.
 - 2. Type: 6061 or 6063 as applicable to work.
 - 3. Finish:
 - a. Concealed: Mill finish
 - b. Exposed: Mill finish, or Anodized or Kynar 500 or Hylar 5000 finish as specified in color selected by Architect from manufacturer's standard colors.

2.2 MISCELLANEOUS METAL ITEMS

- A. The following is a list of the principal miscellaneous metal items to be furnished under this Section. This list is offered only as a guide and Contractor shall thoroughly check drawings for other miscellaneous metals. All items exposed to the exterior shall be hot-dip galvanized after fabrication.
 - 1. Guard Post (Bollards): Provide 6.625 inch O.D. Schedule 40 hot-dip galvanized steel pipe guard post (bollards) as detailed on the drawings. Fill with 2,500 PSI concrete after installation and round off concrete top. Place in concrete footing as detailed on drawings. Galvanize pipe after fabrication. Paint as directed by Architect.
 - 2. Removable Guard Post (Bollards): Provide 5.047 inch I.D. Schedule 40 hot-dip galvanized steel pipe sleeve with 1-1/2 inch by 1-1/2 inch by 1/4 inch by 2 inch steel angle with 1/2 inch diameter hole for lock welded to pipe as detailed on the drawings. Plug bottom of pipe to keep from filling with concrete from footing. Place in concrete footing as detailed on drawings. Provide 4.50 inch O.D. Schedule 40 hot-dip galvanized steel pipe insert with 1-1/2 inch by 1-1/2 inch by 1/4 inch by 2 inch steel angle with 1/2 inch diameter hole for lock welded to pipe as detailed on the drawings. Fill smaller

- diameter pipe with 2,500 PSI concrete after installation and round off concrete top. Hot-dip galvanize all components after fabrication. Paint as directed by Architect.
3. Sign Posts:
 - a. Accessible Parking Sign Posts: 2 inch by 12 inch galvanized steel tube with integral welded galvanized post cap, painted in color selected by Architect.
 - 1) Post Anchor Bolts: Two (2) galvanized 1/2 inch by 6-1/8 inch Nelson stud anchor bolts welded to steel tube front and back.
 - b. Signs: Refer to Section Graphics.
 4. Handrails and Brackets:
 - a. Steel Pipe Handrails and Brackets: Furnish and install 1-1/2 inch O.D. Schedule 40 steel pipe rails for outdoor stairs and ramps, unless noted otherwise. Brackets shall be wall type. Include all other components required for finished installation. All work shall comply with local codes and Texas Accessibility Standards (TAS). Hot dip galvanized all components after fabrication.
 - b. Aluminum Handrails and Brackets: Furnish and install 1-1/2 inch O.D. aluminum pipe rails for indoor stairs and ramps, unless noted otherwise. Brackets shall be wall type. Include all other components required for finished installation. All work shall comply with local codes and Texas Accessibility Standards (TAS).
 5. Steel Ladders: Fabricate from 2-1/2 inch by 3/8 inch flat bar steel stringer with 3/4 inch steel rod rungs let into stringers, welded and ground smooth. Provide all angle supports and anchoring devices for bolting to wall, floor, or structure as required. Hot-dip galvanize after fabrication.
 6. Steel Ships Ladders: Fabricate from steel shapes as shown, weld joints and grind smooth. Provide cages where shown. Hot-dip galvanize after fabrication. Masonry Anchors (At steel columns): Fabricate from 5/16 inch dia. steel, galvanized after fabrication; field weld to columns, space not more than 24 inches o.c. vertically to coincide with horizontal mortar joint elevations. Refer to Structural Drawings.
 7. Loose Lintels: Fabricate from steel shapes as shown on drawings, weld joints and grind smooth. Hot-dip galvanize after fabrication.
 8. Frame Supports: Construct above ceiling frame supports for aluminum entrances and storefronts, hollow metal frames of channels and/or tubes, with all anchorage devices as detailed or required.
 9. Below and Above-Ceiling Supports: Construct of UNISTRUT members or as approved by Architect to size and shaped detailed. All work shall be accurate to 1/8 inch plus or minus. Provide supports complete with fastenings to structure for overhead equipment.
 10. Shelf Angles for Masonry: Sizes and shapes as detailed. Use specified galvanized steel for angles on exterior walls. Paint exposed surfaces as directed by Architect.
 11. Access Doors: Provide one (1) 2 feet-0 inches by 2 feet-0 inches at each restroom plumbing chase wall. If not shown on drawings, locate as indicted by Architect's field representative. Approved Manufacturers: Bar-Co., Cesco Products, J. L. Industries, Karp Associates, Milcor Inc., Nystrom Inc., and The Williams Brothers Corp. Provide painted finish.
 12. Foot Scrapers: Fabricate from steel shapes as shown on drawings, weld joints and grind smooth. Hot dip galvanize after fabrication.
 13. Condenser Water Pump Base Plate: Fabricate from steel plate with holes for anchor bolts as shown on drawings or required. Hot dip galvanize after fabrication. Provide stainless steel anchor bolts of size, type, and finish as shown or recommended by fabricator to suit application.
 14. Stair Safety Nosings:
 - a. American Safety Tread Co.
 - 1) Provide Model 24 at all concrete stairs (concrete risers and treads - not steel pan stairs).
 - 2) Provide Model 9311 at steel pan stairs to receive a paver tile finish.
 - 3) Provide Model 8511 at sloped riser - steel pan stairs with a sealed concrete finish.
 - b. Additional approved manufacturers:
 - 1) Balco/Metalines

- 2) Safe T Metal Co.
 - 3) Schluter Systems
 - 4) Wooster Products, Inc.
15. Conduit Trenches, Frames and Covers:
 - a. Trench Pan: Heavy Metal Form Pan with 12 inch interior trench width dimension and four (4) inch depth.
 - b. Trench: Type EXTC-B with Type R Cover with recess design to accept vinyl composition tile. Cover shall be set 1/8 inch above concrete floor so that the finished top is flush with the finished VCT floor.
 - c. Locations: As shown on drawings.
 - d. Acceptable Manufacturer: McKinley Iron Works, Fort Worth, Texas; (800) 792-2273, or Architect approved equal.
 16. Sidewalk Trench Covers and Frames: Provide trench covers and frames at sidewalks where shown on drawings or required. Approved Product/Manufacturers: Type TGLB-10 as manufactured by McKinley Iron Works, Fort Worth, Texas; (800) 792-2273; Barrycraft Pedestrian- Handicap/Bicycle Trench Grating B-PED-A2 as manufactured by Barry Pattern & Foundry Company, Inc. Birmingham, Alabama (800) 524-1809; or Architect approved equal.
 17. Cast Iron Downspout Boots: Provide cast iron downspout boots conforming to Type DS4 as manufactured by McKinley Iron Works, Inc., Fort Worth, TX; (800) 792-2273, or Architect approved equal. Provide downspout boots with standard rust inhibitive primer. Paint downspout boots in the field to match the color of downspouts as selected by Architect.
 18. Bicycle Racks: Provide and install (3) Single entry bicycle racks. Design Basis for bicycle racks is Porter model number 00391-000. Bicycle Racks shall consist of unitized welded spreader frame constructed from galvanized steel. The unit is approximately 10'-6" long by 3'-6" wide and each shall be constructed to hold (10) bicycles. All hardware and labor shall be provided to anchor the units to the concrete sidewalk as depicted in the drawings.
 19. Decorative Aluminum Guardrail and Handrail System:
 - a. Panels: All panels are pre-designed 30 inch square aluminum modules with design as indicated on drawings. Powder coated finish shall be as selected by Architect from manufacturer's available colors.
 - b. Posts: Standard aluminum post shall be two (2) inches by three (3) inches. Corner post application shall use a three (3) inch square section or, if not a 90 degree corner application, two (2) posts shall be used either side of the corner. Posts shall be mounted to the structure by welding the internal steel supporting structure to an embedded steel plate. Post finish shall be powder coated in color selected by Architect from manufacturer's available colors.
 - c. Handrail: 1-1/2 inch O.D. aluminum pipe in satin, non-directional finish.
 - d. Location: Second Floor and stairs as indicated on the drawings.
 - e. Approved Product/Manufacturer: Design Basis for Panel Railing System as manufactured by Livers Bronze Company, Kansas City, MO (816) 300-2828; Architectural Metal Crafts, Houston, TX (281) 449-1881; Big D Metalworks, Dallas, TX (800) 299-9767; Sterling Dula, Austin, TX (512) 794-8617; York Metal Fabricators, Inc., Oklahoma City, OK (405) 528-7495; or Architect approved equal; refer to Division 1 for substitutions process.
 24. Field Fabricated Ornamental Railing:
 - a. Panels: 2 feet-6 inches by 2 feet-6 inches, steel, paint, match design configuration and intermediate panel component sizes similar to Livers Bronze Style No. 18.
 - b. Posts: As shown on drawings, steel, paint.
 - c. Corner Posts: As shown on drawings, steel, paint.
 - d. Cap Rail:
 - 1) Style: 3-1/2 inch O.D. Rail Cap.
 - 2) Metal: Extruded aluminum, clear anodized.
 - e. Side Rail: 1-1/2-inch diameter extruded aluminum handrail and bracket as specified above.

- f. Finish:
 - 1) Paint Color: As selected by Architect from manufacturer's available colors.
- 15. Catwalk Structure: Fabricate from steel shapes as shown on drawings. Fabricate floor from standard metal bar grating with rectangular bearing bars and cross bars of size and spaced as required and recommended by NAAMM. Cross bars shall be welded or fused to bearing bars. Ends of grating shall be banded at supports. Weld grating to supports at bearing bars and banded ends. Align all bars in adjacent panels. Provide attachments and all catwalk accessories and miscellaneous supports as indicated. Weld all joints and grind smooth. Shop prime paint and field paint under Paint Section.
 - a. Stage Area: Provide catwalk accessories and miscellaneous supports as indicated. Refer to Architectural, Structural, and Stage Theater Drawings.
- 16. Aluminum Column Covers:
 - a. Covers shall be extruded aluminum, .145 thickness with clear anodized finish, fabricated in two vertically divided sections attached with demountable interlock assembly.
 - b. Fasteners: concealed.
 - c. Manufacturer to provide support structures
 - d. Locations: as shown on drawings.
 - e. Basis of Design: Series 2000 by Pittconn Industries, Riverdale, MD; (800) 637-7638; or Architect approved equal.
- B. Other Miscellaneous Items: Miscellaneous metal items and their related components are not necessarily individually described. Miscellaneous items not described shall be furnished and installed in accordance with the intent of the drawings and specifications and as required to complete the work.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Separate all dissimilar metals.
- B. Welded Joint Finishes: Where welding is exposed to view, welds shall be executed neatly then ground smooth. Pits and blemishes are not acceptable. Provide joints as stated above in accordance with NOMMA Guideline 1.
- C. For manufactured items, adhere to printed manufacturer's installation instructions.
- D. Refer to painting section for items that are to receive paint.

END OF SECTION 05 50 00

SECTION 22 12 19**FACILITY GROUND-MOUNTED, POTABLE-WATER STORAGE TANKS****PART 1 - GENERAL****1.01 RELATED DOCUMENTS**

- A. Drawings and General Provision of Contract, including General and Special Conditions and Division 1 Specification Section, apply to work of this Section.

1.02 SUMMARY

- A. Provide all engineering, design, erection, and testing for new elevated storage tank for fire protection service.

1.03 ALLOWANCES

[List Allowances, if included as part of the contract. Confirm with OSHEM and COTR]

1.04 UNIT PRICES

[List Unit Prices, if included as part of the contract. Confirm with OSHEM and COTR]

1.05 DEFINITIONS

- A. COTR: Contracting Officer Technical Representative
- B. FM: FM Global (Factory Mutual)
- C. FPE: Fire Protection Engineer
- D. Furnish: To supply the stated equipment or materials
- E. Install: To set in position and connect or adjust for use
- F. NFPA: National Fire Protection Association
- G. NICET: National Institute for Certification in Engineering Technologies
- H. OSHEM: Office of Safety Health and Environmental Management
- I. Provide: To furnish and install the stated equipment or materials
- J. UL: Underwriters Laboratories

1.06 SYSTEM DESCRIPTION

- A. New _____gallon (____liter) dedicated fire protection water storage tank. Tank shall be [fluted column] [pede sphere] [standpipe] design.

1.07 PERFORMANCE REQUIREMENTS

- A. Design and Construction Standards
 - 1. National Fire Protection Association (NFPA) 22, Standard for Water Tanks for Private Fire Protection
 - 2. The design, fabrication, and erection of the [elevated tank] [standpipe][reservoir] shall be in accordance with the applicable requirements of AWWA D100 or AWWA D103 except as modified herein. Earthquake design shall be [in accordance with UFC 3-310-04 SEISMIC DESIGN FOR BUILDINGS and Sections 13 48 00 SEISMIC PROTECTION FOR MISCELLANEOUS EQUIPMENT and 13 48 00.00 10 SEISMIC PROTECTION FOR MECHANICAL EQUIPMENT] [as indicated]. No additional thickness for corrosion allowance will be required.

3. Design metal temperature shall be [] degrees F. The elevated tank shall be designed for a basic wind speed of []mph in accordance with ASCE 7 or designed in accordance with AWWA D100 wind load design, whichever provides the greater pressure. [The elevated tank shall be designed for a snow load of 25 psf []]. The [standpipe][reservoir] shall be designed for a peak wind speed of [] and snow load of [].
- B. Welding
1. Qualification of welding procedures, welders, and welding operators shall be in accordance with Section 8.2 of AWWA D100.
- C. Design Requirements
1. The elevated tank shall have a storage capacity of [] gallons. The high-water level of tank shall be at elevation [] with the top of column foundations at elevation []. The range between high and low water levels shall be approximately [] feet. The existing grade at the tank site is approximately elevation []. The top of straight side sheets, where a cone-shaped roof is furnished, shall not be less than 6 inches above the top of the overflow weir. The tank diameter shall be not less than [] feet and the riser diameter not less than [] feet.
 2. The tank shall [be of the style shown] [have an ellipsoidal bottom, with vertical side sheets and a cone shaped top, or shall be of an elliptical or oval design as approved. In the latter design, the lower section of the roof may be used for water storage].
 3. The tower supporting the tank shall be constructed of structural shapes of the open type, or of tubular sections, to permit inspection and painting. The tower shall be thoroughly braced with horizontal struts and diagonal ties. The tower columns may be vertical or inclined as the design may require. Main column splices shall be as few as possible and shall be located as near as practicable to the intersection of the centerline of the struts. Splice plates shall be welded so as to hold the members in line and transmit any tension or hearing stresses to which the members may be subjected.
 4. The connections of the tank, with the columns shall be made to distribute the load properly over the column sections and over the shell of the tank.
 5. Around the bottom of the tank a balcony meeting the requirements of Section 4.7.2 of AWWA D100 and conforming to all federal or local laws or regulations shall be provided. Balcony floor plates shall be at least 1/4 inch thick and shall be suitably punched or drilled for drainage.
- D. Sizing and Design
1. Sizing and design of elevated tank shall be in accordance with Section 4 of AWWA D100. Submit a certificate signed by a registered professional engineer providing: (1) description of the entire tank and foundation structural design loading conditions, (2) description of structural design methods and codes used in establishing allowable stresses and safety factors, (3) statement that the structural design has been checked by experienced engineers specializing in hydraulic structures to ensure that design calculations for member sizes, dimensions, and fabrication processes are as prescribed by ACI and AWWA standards, and (4) certification that the completed work was inspected in accordance with AWWA D100 or AWWA D103 as applicable.
- E. [Standpipe] [Reservoir]
1. The [standpipe] [reservoir] shall have a storage capacity of [] gallons. The high-water level of [standpipe] [reservoir] shall be at elevation[] with the top of foundation approximately at elevation []. The range between high and low water levels will be approximately [] feet.

2. Existing grade at proposed location is approximately elevation [____]. The [standpipe] [reservoir] shall have such standard shell height and such diameter as will meet the requirements for the selected standard capacity and for the high-water level specified above.
3. The [standpipe] [reservoir] may have [supported cone roof,] [supported toriconical roof,] [self-supporting umbrella roof,] [self-supporting dome roof, or] [ellipsoidal roof,] [aluminum self-supporting dome roof,] as approved. The [standpipe] [reservoir] shall be of welded or bolted construction.

F. Coatings Certification

1. Coating materials for interior applications and all other materials which will be in normal contact with potable water shall conform to NSF 61. Certification by an independent third-party organization that all interior coatings and materials, that come in contact with potable water, comply with NSF 61 shall be provided.

1.08 SUBMITTALS

A. The following shall be submitted in accordance with Section 01 33 00

B. Shop Drawings

1. Tank Installation: Detail and erection drawings, before proceeding with any fabrication. Complete drawings with details of steel, pipe, and concrete work, and of the assembling of items required for the total installation. Use standard welding symbols as recommended by the American Welding Society. Details of welded joints referenced on the drawings shall be included.

C. Product Data

1. System Description
2. Foundations
3. Design Analysis and Calculations

D. Test Reports

1. Tank Installation
2. Testing of Valves and Piping
3. Each coating manufacturer's technical data, application instructions, Material Safety Data Sheets (MSDS), and certificate for compliance for VOC content.
4. Copies of the following test results:
 - a. Manufacturer's mill test reports for plate material.
 - b. Mill and shop inspections by a commercial inspection agency.
 - c. After acceptance of the structure, the radiographic film and test segments.
 - d. At the conclusion of the work, a written report prepared by the Contractor covering the hydrostatic test and certifying that the work was inspected in accordance with Section 11.2.1 of AWWA D100.

5. Certificates

- a. System Description
- b. Foundations
- c. Certification by an independent third-party organization that all interior coating and materials that come in contact with the potable water comply with NSF 61.

- d. A certificate signed by a registered professional engineer, providing the following information:
 - 1) Description of the structural design loading conditions used for the design of entire tank including the foundation.
 - 2) Description of the structural design method and codes used in establishing the allowable stresses and safety factors applied in the design.
 - 3) A statement verifying that the structural design has been checked by experienced engineers specializing in hydraulic structures.
 - 4) A statement verifying that the detail drawings have been checked by experienced engineers specializing in hydraulic structures to determine that they agree with the design calculations in member sizes, dimensions, and fabricating process as prescribed by applicable ACI and AWWA standards.

1.09 QUALITY ASSURANCE

- A. Manufacturers Qualifications: The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.
 - 1. AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)
 - a. ASCE 7 (2005; Supp 1) Minimum Design Loads for Buildings and Other Structures
 - 2. AMERICAN WATER WORKS ASSOCIATION (AWWA)
 - a. AWWA B300 (2004) Hypochlorites
 - b. AWWA B301 (2004) Liquid Chlorine
 - c. AWWA C104/A21.4 (2003) Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
 - d. AWWA C105/A21.5 (2005) Polyethylene Encasement for Ductile-Iron Pipe Systems
 - e. AWWA C110/A21.10 (2008) Ductile-Iron and Gray-Iron Fittings for Water
 - f. AWWA C111/A21.11 (2000) Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
 - g. AWWA C115/A21.15 (2005) Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges
 - h. AWWA C150/A21.50 (2002; Errata 2003) Thickness Design of Ductile-Iron Pipe
 - i. AWWA C151/A21.51 (2002; Errata 2002) Ductile-Iron Pipe, Centrifugally Cast, for Water
 - j. AWWA C500 (2002; R 2003) Metal-Seated Gate Valves for Water Supply Service
 - k. AWWA C504 (2006) Standard for Rubber-Seated Butterfly Valves
 - l. AWWA C508 (2001) Swing-Check Valves for Waterworks Service, 2 In. (50 mm) Through 24 In. (600mm) NPS
 - m. AWWA C600 (2005) Installation of Ductile-Iron Water Mains and Their Appurtenances
 - n. AWWA C652 (2002) Disinfection of Water-Storage Facilities
 - o. AWWA D100 (2005; Errata 2007) Welded Steel Tanks for Water Storage
 - p. AWWA D103 (1997) Factory-Coated Bolted Steel Tanks for Water Storage
 - q. ASME B16.3 (2006) Malleable Iron Threaded Fittings, Classes 150 and 300

- r. ASME B40.100 (2005) Pressure Gauges and Gauge Attachments
- 3. ASTM INTERNATIONAL (ASTM)
 - a. ASTM A 197/A 197M (2000; R 2006) Standard Specification for Cupola Malleable Iron
 - b. ASTM A 48/A 48M (2003) Standard Specification for Gray Iron Castings
 - c. ASTM A 53/A 53M (2007) Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
- 4. MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS)
 - a. MSS SP-80 (2003) Bronze Gate, Globe, Angle and Check Valves
- 5. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
 - a. NFPA 24, Standard for Water Tanks for Private Fire Protection.
- 6. NSF INTERNATIONAL (NSF) NSF 61 (2007a; Addendum 2007) Drinking Water System Components - Health Effects
- 7. THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)
 - a. SSPC PS 4.04 (1982; E 2004) Four-Coat White or Colored Vinyl Painting System (For Fresh Water, Chemical, and Corrosive Atmospheres)
 - b. SSPC PS Guide 17.00 (1982; E 2004) Guide for Selecting Urethane Painting Systems
 - c. SSPC Paint 104 SSPC Paint 21(1982; E 2004) Paint Specification No. 104White or Tinted Alkyd Paint (1982; E 2004) Paint Specification No. 21White or Colored Silicone Alkyd Paint (Type I, High Gloss and Type II, Medium Gloss)
 - d. SSPC Paint 25 (1997; E 2004) Paint Specification No.25Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel Type I and Type II

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver paint in unopened containers with unbroken seals and labels showing designated name, specification number, color, directions for use, manufacturer, and date of manufacture, legible and intact at time of use.
- B. Handle and store water storage tank systems, components, and parts to prevent distortions and other damage that could affect their structural, mechanical, or electrical integrity.
- C. Replace damaged items that cannot be restored to original condition.
- D. Store items subject to deterioration by exposure to elements, in a well-drained location, protected from weather, and accessible for inspection and handling.

1.11 PROJECT CONDITIONS

[List any special project conditions and/or environmental limitations on system installation, such as temperature, humidity, ventilation, etc.]

1.12 COORDINATION

- A. Coordinate major equipments and piping layouts with other trades to avoid obstructions and excessive changes in direction for piping.

1.13 WARRANTY

- A. The Contractor shall guarantee labor, materials, and equipment provided under this contract against defects for a period of one year after the date of final acceptance of this work by the Government.
- B. Final acceptance includes, but is not limited to, the receipt and OSHEM approval of, as-built drawings and operation and maintenance manuals.

1.14 SERVICE AGREEMENT

[List requirements, if part of the contract. Confirm with OSHEM and COTR].

1.15 EXTRA MATERIALS

[List special requirements for spare parts, if part of the contract. Confirm with OSHEM and COTR].

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Provide materials conforming to the following requirements:
 - 1. Steel
 - 2. Shop Fabrication
 - a. Section 2 of AWWA D100 or Section 2 of AWWA D103.
 - b. Section 9 of AWWA D100 or Section 7 of AWWA D103.

2.02 PIPE

- A. Ductile-Iron Pipe
 - 1. Pipe for fluid conductors, except for overflow pipe, shall be ductile-iron pipe and shall be either of the following:
- B. Bell-and-Plain End Pipe
 - 1. AWWA C150/A21.50 and AWWA C151/A21.51, for not less than 150 psi working pressure, unless otherwise shown or specified. Joints shall be push-on or mechanical-joint conforming to AWWA C111/A21.11. Pipe shall be cement mortar lined in accordance with AWWA C104/A21.4. Linings shall be standard thickness.
- C. Flanged Pipe
 - 1. Flanged pipes shall conform to the applicable portions of AWWA C110/A21.10, AWWA C115/A21.15 and AWWA C151/A21.51, for not less than 150 psi working pressure, unless otherwise shown or specified. Pipe shall have flanged ends in accordance with AWWA C115/A21.15. Pipe shall be cement mortar lined in accordance with AWWA C104/A21.4. Linings shall be standard thickness.
- D. Specials and Fittings (except for overflow pipe)
 - 1. Ductile-Iron with Bell-and-Plain End
 - a. AWWA C110/A21.10 and AWWA C151/A21.51 for not less than 150 psi working pressure, unless otherwise shown or specified. Specials and fittings shall be cement mortar lined in accordance with AWWA C104/A21.4. Linings shall be standard thickness.
 - 2. Ductile-Iron with Flanged Ends
 - a. AWWA C110/A21.10 and AWWA C151/A21.51 for not less than 150 psi working pressure unless otherwise shown or specified. Fittings shall have flanged ends in accordance with AWWA C110/A21.10. Specials and fittings shall be cement mortar lined in accordance with AWWA C104/A21.4. Linings shall be standard thickness.
- E. Fittings for Screw-Joint Pipe

1. 1. Malleable-iron, galvanized, 150 psi, ASTM A 197/A 197M, threaded ends, ASME B16.3.

F. Joints Inside Valve Chamber

1. All joints inside the valve chamber shall be flanged.

2.03 VALVES

A. Gate Valves

1. All valves serving water supply and discharge pipes for water storage tanks shall be gate valves or Post Indicator Valves. Gate valves shall be opened by turning counterclockwise. Valves 3 inches and larger shall be iron body, brass mounted, conforming to AWWA C500. Valves smaller than 3 inches shall be all bronze and shall conform to MSS SP-80, Type 1, class 150. Valves 3 inches or larger located in valve chambers shall be equipped with hand-operating wheels and shall be flanged.

B. Check Valves

1. Check valves shall be of the horizontal swing-check type, suitable for the purpose and the operating conditions. The body shall be iron and shall have a removable gate assembly and a cover removable for inspection. The gate, gate seat, shaft, gate studs, and nuts shall be bronze or other suitable alloy. Valves shall conform to AWWA C508.

C. Altitude Valve

1. The supply to the [elevated tank] [standpipe] [reservoir] shall be controlled by a [_____] inch altitude valve, automatic in operation and accurately set to prevent overflow of the [elevated tank] [standpipe][reservoir]. The valve shall have flanged ends and a heavy cast iron body, shall be bronze fitted with renewable cups and seats, and shall be designed without metal-to-metal seats. The valve shall be cushioned when opening and closing to prevent water hammer or shock. Valves shall be provided with a travel indicator.

2.04 PRESSURE GAUGE

1. Pressure gauge of the direct-reading type, equipped with a shutoff cock, shall be provided, in the valve chamber, on the tank side and on the discharge side of the check or altitude valve. Gauges shall have 6 inch dials, shall be stem mounted, and shall conform to ASME B40.100. Accuracy of gauges shall be Grade A or better. Gauges shall be calibrated in psi in not more than 2 psi increments from 0 to 50 psi in excess of the **normal operating pressure at the tank.**

2.05 ASSEMBLIES

A. Tank Accessories

1. Section 7 of AWWA D100 or Section 5 of AWWA D103 and as specified. Additional requirements for accessories are as follows:

B. Manholes and Pipe Connections

1. Section 7 of AWWA D100 and Section 5 of AWWA D103 represent the minimum requirements. Number, type, location, and size of manholes and pipe connections shall be as shown on the drawings. Inlet pipe connections to extend [_____] inches above tank bottom and shall be provided with deflectors as shown on the drawings. Outlet pipe connections to extend [_____] inches above tank bottom and shall be provided with vortex breakers as shown on the drawings.

C. Overflow

1. The overflow for the tank shall consist of an overflow weir and [stub overflow] [outside drop pipe, adequately supported and] capable of discharging at a rate of [_____] gpm

with [] inches of head [, without the water level exceeding []]. [The top of the weir shall be [] inches below [].] [The weir shall be located as indicated.] The [stub overflow shall be steel, ASTM A 53/A 53M or equal, and shall be fitted with a screen] [overflow pipe shall be steel, ASTM A 53/A 53M or equal, and shall terminate 1 to 2 feet above grade and shall be fitted with a flapper valve or screen to prevent ingress of animals and insects].

D. Vent

1. Vent shall be welded to the cover plate of the center manhole on the roof. Vent will be tank manufacturer's standard type mushroom vent with aluminum bird screen. The free area of the vent shall be sized 50 percent in excess of the [] gpm pump-in rate and [] gpm pump-out rate. Screening for vent shall conform to Section 5.7.2 of AWWA D100 or Section 5.7.2 of AWWA D103 which ensures fail-safe operation in the event that screen frosts over and the bottom of the screen shall be sufficiently elevated for snow consideration in the area.

E. Ladders and Safety Devices

1. Ladders and safety devices shall be provided in accordance with Sections 7.4 and 7.5 of AWWA D100 or Sections 5.4 and 5.5 of AWWA D103. Location of ladders shall be as shown on the drawings. Sections 7.4 and 7.5 of AWWA D100 and Sections 5.4 and 5.5 of AWWA D103 represent the minimum requirement. In addition, safety cage, rest platforms, roof ladder handrails, and other safety devices shall be provided as required by federal or local laws or regulations.

F. Scaffold Cable Support

1. Provision shall be made for the attachment of a scaffold cable support at the top of the roof on welded tanks.

G. Balconies

1. Provide a balcony a minimum of 2 feet wide with a standard guard railing. Provide a structural steel railing with a top rail 42 inches above balcony platform with an intermediate rail halfway between. Guard rail shall be capable of withstanding a force of 200 pounds applied in any direction. Install a steel toe board with minimum height of 4 inches. Bottom of toe board shall be a maximum 1/4 inch from platform top. Extend guard rail and toe board entire length of balcony except where access openings are required. For balcony floors use diamond plates a minimum of 1/4 inch thick, punched or drilled for drainage. [Equip access openings in guardrail with a gate which closes automatically.] Hatches through balcony floor shall be counterbalanced or otherwise arranged to open from below.

H. Coating for Welded Tanks

1. Provide exterior coating systems conforming to Section 09 97 13.27, "Exterior Coating of Steel Structures," and interior coating systems conforming to Section 09 97 13.16, "Interior Coating of Welded Steel Water Tanks."

I. Coating for Bolted Tanks

1. As supplied by the manufacturer.

J. Valve Chamber

1. Valve chamber shall be sufficiently large to house all control valves and fittings. Pipes, valves, and fittings shall be supported on concrete blocks where necessary. The valve chamber shall be constructed to provide not less than [] feet of cover over the pipes. The valves and fittings shall extend from the [standpipe] [reservoir] [riser pipe] connection to a point one length of pipe outside the valve chamber walls on the main or feed line to the [elevated tank] [standpipe] [reservoir]; the drain line will be carried to an

outlet as indicated on the drawings. The access manhole shall be not less than 30 inches in diameter.

K. Anchors for [Standpipe] [Reservoirs]

1. The following requirements shall be met:

- a. An adequate number of anchors designed to prevent overturning of the [standpipe] [reservoir] when empty shall be installed. If anchor bolts are used, the nominal diameter shall not be less than one inch, plus a corrosion allowance of at least 1/4 inch on the diameter. If anchor straps are used, they shall be pre-tensioned before welding to the tank shell.
- b. The anchor bolts shall be a right angle bend, hook, or plate washer, while anchor straps shall have only a plate welded to the bottom. The anchors shall be inserted into the foundation to resist the computed uplift.
- c. Attachment of anchors to the shell shall not add significant localized stresses to the shell. The method of attachment shall consider the effects of deflection and rotation of the tank shell. Anchors shall not be attached to the tank bottom. Attachment of the anchor bolts to the shell shall be through stiffened chair-type assemblies or anchor rings of adequate size and height.

2.06 CONCRETE WORK

- A. Concrete work shall conform to Section [03 31 00.00 10 CAST-IN-PLACE STRUCTURAL CONCRETE][03 30 00 CAST-IN-PLACE CONCRETE].

2.07 CHLORINE

- A. AWWA B300 for hypochlorites or AWWA B301 for liquid chlorine, mixed with water to give the solutions required in AWWA C652.

PART 3 - EXECUTION

3.01 FOUNDATIONS

- A. Foundations for the [standpipe] [reservoir] [tank columns and riser] and for the valve chamber shall be constructed of concrete, reinforced where necessary, and designed in accordance with Section 12 of AWWA D100 or Sections 11 and 8.5 of AWWA D103 for earth with a bearing value of [_____] psf, at elevation [____], and constructed in conformance with the applicable requirements of Section [03 31 00.00 10 CAST-IN-PLACE STRUCTURAL CONCRETE][03 30 00 CAST-IN-PLACE CONCRETE], except as shown or specified herein. An AWWA D100 Type 1 or an AWWA D103 Type 1 or Type 2 foundation shall be provided for the [standpipe] [reservoir]. Factor of safety on overturning of [elevated tanks] [standpipe] [reservoir] under design windload shall be 1.33 minimum. When a footing is required, an inverted truncated pyramid of earth with 2 on 1 side slopes above top of footing maybe used in **determining overturning stability.**

3.02 EXCAVATING, FILLING, AND GRADING

- A. Excavating, filling, and grading shall conform to the applicable **requirements of Section 31 00 00 EARTHWORK.**

3.03 CATHODIC PROTECTION

- A. Cathodic protection shall be provided, conforming to Section 26 42 15.00 10 CATHODIC PROTECTION SYSTEM (STEEL WATER TANKS).

3.04 OBSTRUCTION LIGHTING

- A. Obstruction lighting shall be provided and installed as shown, and shall conform to Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM or FAA AC 150/5345-43.

3.05 BEACON

- A. Beacon shall be provided and installed as shown, and shall conform to Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM.

3.06 TANK INSTALLATION

- A. Tank installation shall be in accordance with the following requirements:
 - 1. Welding Section 8 of AWWA D100 or Section 6 of AWWA D103.
 - 2. **Erection Section 10 of AWWA D100 or Section 8 of AWWA D103.**

3.07 INSPECTIONS AND TESTING

- A. Tank inspection and testing shall be in accordance with Section 11 of AWWA D100 or Section 9 of AWWA D103. Mill and shop inspections [are not required] [are required and shall be performed by an approved commercial inspection agency].
- B. Perform the radiographic inspections of the welded tank shell, the hydrostatic test and the vacuum box leak test of the tank bottom. Final hydrostatic and leak tests shall be performed before painting of welded tanks.

3.08 PIPING INSTALLATION (EXCEPT FOR OVERFLOW PIPING)

- A. General Guidelines
 - 1. Where details of fabrication or installation are not shown on the drawings, installation shall conform to Section 1 and 3 of AWWA C600.
- B. Testing of Valves and Piping
 - 1. After the [elevated tank] [standpipe] [reservoir] has been erected and the valves and piping installed, and before field painting is begun, the valves and piping shall be hydrostatically tested in accordance with Section 4 of AWWA C600. Replace with sound material any defective material disclosed by the pressure test; the test shall be repeated until the test results are satisfactory.
- C. Polyethylene Encasement of Underground Ductile-Iron Piping Polyethylene encasement of underground ductile-iron piping shall be provided in addition to asphaltic coating in accordance with AWWA C105/A21.5.
- D. Plugging Ends: Pipe ends left for future connections shall be capped or plugged as directed.

3.09 PAINTING AND COATING OF TANK

- A. Each coating manufacturer's technical data, application instructions, Material Safety Data Sheets (MSDS), and certificate for compliance for VOC content shall be submitted to the COTR. Application, curing time, mixing and thinning of the coating materials shall be in strict accordance with the manufacturers instructions. The use of thinners shall not alter the required minimum dry thickness or adversely affect the VOC content.
- B. Exterior Surfaces (Welded Tanks)
 - 1. [A prime coat, minimum of 2.0 mil thick followed by two coats of alkyd enamel, each a minimum of 1.5 mil thick shall be applied. The prime coat shall be rust inhibitive red iron oxide, zinc oxide, oil and alkyd primer without lead or chromate pigments, in accordance with SSPC Paint 25. The finish coats shall be [white alkyd enamel in accordance with Type I of SSPC Paint 104] [_____] gloss alkyd enamel in accordance with SSPC Paint 21] [alternating panels (checkerboard) of white alkyd enamel in accordance with Type I of SSPC Paint 104 and international orange gloss alkyd enamel in accordance with SSPC Paint 21 color 12197].]
 - 2. [[A gray vinyl prime coat a minimum of 1.5 mil thick followed by two coats of [white] [light gray] vinyl paint, each a minimum of 1.5 mil thick shall be applied. SSPC PS 4.04] [A

two-component catalyzed epoxy prime and intermediate coat, The primer and paint shall be VR-3 in accordance with each a minimum of 3.0 mil thick, followed by a two-component catalyzed aliphatic polyurethane finish coat, a minimum of 1.5 mil thick, conforming to Type V of SSPC PS Guide 17.00 shall be applied. The prime coat shall be a green primer, Formula 150 in accordance with MIL-DTL-24441. The intermediate coat shall be white Formula 152 in accordance with MIL-DTL-24441 and may be tinted with pigment color. The finish coat shall be [white] [_____] [alternating panels (checkerboard) of international orange and white]].]

C. Interior Surfaces (Welded Tanks)

1. [A prime coat at least 3.0 mil thick and a [white] [_____] final coat at least 5.0 mil thick shall be applied. Each coat shall be a two-component catalyzed epoxy in accordance with MIL-PRF-23236. The primer shall contrast with the color of the finish coat.] [Four coats, each at least 1.5 mil thick, of VR-3 vinyl resin paint in accordance with SSPC PS 4.04 shall be applied. The second, third, and fourth coats shall be of contrasting colors.]

D. Bolted Tanks

1. The tanks shall have a coating applied to both the interior and exterior surfaces in accordance with Section 10 of AWWA D103. Color shall be [as indicated on the drawings] [as approved] [_____].

3.10 DISINFECTION

- A. The [elevated tank] [standpipe] [reservoir] and connecting lines thereto shall be disinfected with chlorine before being placed in operation.

B. Tank

1. The [elevated tank] [standpipe] [reservoir] shall be disinfected in accordance with [AWWA C652] [_____]. After the chlorination procedure is completed and before the storage facility is placed in service, the COTR will collect samples of water in properly sterilized containers for bacteriological testing from the full facility in accordance with Section 7 of AWWA C652. The tank will not be accepted until satisfactory bacteriological results have been obtained.[After coating system has been inspected, approved, and cured, rinse tank with potable water. Disinfect tank and connecting lines in accordance with AWWA C652,[Method 1] [Method 2] [or] [Method 3].]

C. Piping

1. The valves and piping shall be disinfected in accordance with Section 33 11 00 WATER DISTRIBUTION.

3.11 INSPECTION AND REPAIR

- A. Prior to tank repair job, perform a detailed inspection of the structure and submit report by a certified inspector.

END OF SECTION 22 12 19

SECTION 31 00 00

EARTHWORK (UNDER BUILDING PAD)

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Protecting and preserving trees and vegetation to remain.
- B. Clearing, stripping, and grubbing of portions of sites which are below the building pads.
- C. Stockpiling stripped topsoil in approved locations.
- D. Excavating for and otherwise providing stable and compact subgrade below the building pads.
- F. Placing and compaction of select fill under improved areas to conform to elevations indicated on the drawings.
- G. Filling and finish grading of area around buildings and other improvements using previously stripped topsoil and additional topsoil that must be purchased and delivered to the site.
- H. Coordinating Work of other Sections affecting or affected by Work of this Section.

1.2 RELATED WORK

- A. Section - Geotechnical Report.
- B. Division 2 - Site Work: Related earthwork, civil, paving, and landscaping sections of work.

1.3 INSPECTION OF SITE

- A. By making a proposal on the Project, the Contractor acknowledges:
 - 1. That the Owner and Architect do not guarantee the accuracy, completeness, or suitability of the contents of the Geotechnical Report or Topographic Survey.
 - 2. That he/she has visited the site to investigate the conditions affecting the Work and has satisfied himself/herself of the character, quality and quantity of surface and subsurface materials or obstacles to be encountered.
- B. The Contractor will be required to establish, maintain and be responsible for all reference points, hubs, grades, elevations, lines, and surface measurements. If any discrepancies in the documents are found, the Contractor shall promptly notify the Architect and await instructions before proceeding.

1.4 QUALITY ASSURANCE

- A. Inspection and Testing Laboratory Services: Test results shall meet or exceed the standards referenced.
- B. Refer to Geotechnical Report, Topographic Survey, and Civil Drawings.

1.5 REFERENCES

- A. ASTM International (ASTM)
 - 1. D698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb/ft³ (600 kN-m/m³) – Test for Moisture Unit Weight Relations of Soils and Soil Aggregate.
 - 2. D2922, Tests for Density of Soil and Soil Aggregate in place by Nuclear Methods.

1.6 PRE-INSTALLATION CONFERENCE

- A. Refer to Section - Notification of Architect Requirements.

PART 2 - MATERIALS**2.1 MATERIALS**

- A. Structural Fill: Sandy clay soils free of organic or other deleterious materials, and have a maximum clay lump size of less than three (3) inches. See Construction Documents for Liquid Limit and Plasticity Index per soils report.
- B. Earth Fill: Shall be excavated material approved by Architect prior to its use as earth fill around building and landscaped areas, but not under building.
- C. Stabilization Materials: Refer to Division 2.
- D. Topsoil: Shall be imported, and shall be free from clay, vegetation, debris, stumps, roots, stones larger than 3/4 inch diameter, or other objectionable matter.

PART 3 - EXECUTION**3.1 GENERAL**

- A. Unknown Utilities and Obstacles:
 - 1. If any unknown or uncharted utilities or objects are encountered during excavation, promptly notify the Architect before proceeding. Arrange with utility and telephone companies for removal and relocation of their equipment, and capping of pipes and wiring as required.
- B. Protection of Vegetation:
 - 1. Rope or fence off areas of the site that are designated to remain with vegetation to prevent vehicular traffic and construction damage.
 - 2. Provide wood barricades around trees and shrubs at their drip line in traffic areas to protect them from construction operations until Substantial Completion, or until barricade removal is directed by Architect.
 - 3. Replace damaged trees and vegetation designated to remain with vegetation of equal kind and size. Follow supplier's recommended procedures for planting necessary replacement vegetation.
- C. Clearing, Stripping and Grubbing (General):
 - 1. Remove brush, vegetation, debris, and surplus materials from the jobsite. Removal of other remaining impediments as may be necessary to properly execute the scope of this contract shall be included herein. Adhere to State and local code requirements for the disposal of trees and shrubs removed from the site.
 - 2. Do not remove trees or shrubs without the specific approval of the Architect. Vegetation damaged, removed, killed, or constricted from normal growth patterns shall be replaced with a comparable item, or the full replacement amount credited to the Owner.
- D. Drainage, Pumping and Grading:
 - 1. Proper drainage of site shall be maintained during construction so that ponding of surface runoff does not occur and cause construction delays and/or inhibit access to the site.
 - 2. Contractor shall control the grading around building so that ground is pitched to prevent water from running into the excavated areas of building or damaging other structures.
 - 3. Provide pumping required to keep excavated spaces clear of water during construction.
 - 4. If any subgrade is damaged due to flooding, damaged area shall be removed and filled with select fill. Placement and compaction of select fill shall meet the requirements for placing and compacting select fill as specified below.
 - 5. If the subgrade, due to any reason or cause, lose the required stability, density, or finish before the foundation structure is placed, it shall be re-compacted and refinished at the sole expense of the Contractor.

3.2 BUILDING FOUNDATION (PAD) PREPARATION

- A. Site preparation area at buildings with and without adjacent sidewalks shall extend beyond the limits of the foundation area. See Construction Documents for Site Preparation limits.
- B. Existing fill material, top soil vegetation, roots, debris, organic material and other miscellaneous debris shall be removed to a depth of 6 inches and legally disposed of. Actual removal depth may vary and will be determined at time of construction.
- C. Over excavate the in-situ soils as required to allow the minimum amount of select structural fill to be placed beneath the slab to achieve the desired elevation. See Construction Documents for amount of select structural fill required per soils report.
- D. After stripping, and excavating to the desired grade as indicated above, the exposed soil shall be proof-rolled to locate all soft or loose areas. Soils, which are observed to rut or deflect excessively under the moving load, shall be undercut and replaced with properly compacted structural fill. The proof-rolling and undercutting activities shall be witnessed by a representative of the geotechnical engineer and shall be performed during a period of dry weather.
- E. Subsequent to proof-rolling, and just prior to placement of fill, the exposed subgrade within the construction areas shall be evaluated for moisture and density. The subgrade soils shall be at or above the optimum moisture content, and have an in-place dry density of at least 95 percent of the standard effort (ASTM D698) maximum dry density of the in-situ soils. If the moisture or density does not meet the above criteria, the subgrade shall be scarified to a minimum depth of 6 inches, and moisture adjusted to meet the requirements per the soils report as indicated on the Construction Documents.
- D. If remediation is required, Contractor shall have any of the following remediation options:
 - 1. Disking and drying with natural means (if the construction schedule allows).
 - 2. Dry the surface soils by chemically treatment.
 - 3. Remove the unsuitably wet soils and replace the wet soil with select fill having an acceptable moisture content. The option will be entirely up to the Contractor and no extra will be paid by the Owner.
- E. After proof-rolling and undercutting has been completed, and the subgrade tested and adjusted as necessary, fill placement may begin. The first layer of fill shall be placed in a relatively uniform horizontal lift and be adequately keyed into the stripped subgrade soils.
- F. Refer to construction drawings for information regarding lime-stabilized subgrade treatment.

3.3 FILL PLACEMENT

- A. Structural fill materials shall be as specified in Paragraph 2.1, A above. Structural fill shall be placed in maximum lifts of eight (8) inches of loose material and shall have a moisture content as indicated on the Construction Documents. If water must be added, it shall be uniformly applied and thoroughly mixed into the soil by disking or scarifying. Each lift of structural fill shall be tested by a representative of the geotechnical engineer prior to placement of subsequent lifts.
- B. Each lift of structural fill shall be compacted as required per the soils report and as indicated on the Construction Documents. Care shall be taken to apply compactive effort throughout the fill and fill scope areas. The moisture content and the degree of compaction of the structural fill soils shall be maintained until the construction of structures above them.
- C. Contractor shall be responsible for damage caused to structure because of over excavation or excavations left open during inclement weather. Should the subgrade, for any reason or cause, lose the required stability, density, or finish before the foundation structure is placed, it shall be re-compacted and refinished at the sole expense of the Contractor.

3.4 GRADING

- A. Rough Grading: Contractor shall control the grading around building so that ground is pitched to prevent water from running into the excavated areas or damaging other structures. Furnish pumping required to keep excavated spaces clear of water during construction. If a foundation excavation must remain empty through a shut-down period, cover with boards and building paper and clean out immediately when work resumes. If any subgrade should be damaged due to flooding, damaged area shall be removed and filled with select fill.
- B. Finish Grading:

1. After rough grading is completed, provide and place previously stripped material or imported top soil in the amounts required to bring the rough grade to within two (2) inches of finish grade. This earth fill shall be placed in lifts not to exceed 12 inches after compaction and shall be compacted to a dry density of at least 95 percent of the ASTM D698 maximum dry density.
 2. Assure bonding of layers of fill material in compliance with the specifications.
 3. Final and fine grading shall be done using a tractor pulled landscape rake and hand raking removing all debris immediately prior to landscaping. The final graded ground surface shall be relatively smooth, free of organic material and in suitable condition to commence landscaping work.
- C. Topsoil:
1. Contractor shall furnish all topsoil that may be required to provide finish elevations. Topsoil material shall meet requirements of Paragraph 2.1 of this Section. Spread minimum two (2) inches of topsoil over graded areas after rough grading has been completed.
 2. At the completion of finish grading, ground surface shall be relatively smooth, free of organic material and in suitable condition to commence landscaping work.

3.5 INSPECTION AND TESTING LABORATORY SERVICES

- A. Refer to Inspection and Testing Laboratory Services for laboratory services to determine the liquid limit, plastic limit and plasticity index for soils and in-place density tests for compacted material.
- B. The Contractor shall cooperate with the inspection and testing laboratory in all matters pertaining to the work.

END OF SECTION 31 00 00

SECTION 31 10 00

SITE CLEARING

Part 1 GENERAL

1.01 SECTION INCLUDES:

- A. Cleaning site of debris, grass, trees and other plant life in preparation for site or building excavation work.
- B. Protection of existing structures, trees or vegetation indicated on the contract documents to remain.
- C. Stripping topsoil from areas that are to be incorporated into the limits of the project and where so indicated on the construction drawings.

1.02 RELATED SECTIONS

- A. Section 02 41 00- Demolition
- B. Section 31 00 00 – Earthwork
- C. Construction Drawings

1.03 ENVIRONMENTAL REQUIREMENTS

- A. Construct temporary erosion control systems as shown on the plans or as directed by the Engineer to protect adjacent properties and water resources from erosion and sedimentation.
- B. In the event that site work on this project will disturb five (5) or more acres, the contractor shall NOT begin construction without a “National Pollution Discharges Elimination System” (NPDES) permit, governing the discharge of storm water from the construction site, for the entire construction period. The permit requires a “Storm Water Pollution Prevention Plan” (SWPPP) to be in place during construction which includes monitoring of storm water flows during construction.

The contractor shall be completely responsible for conducting the storm water management practices in accordance with the NPDES permit and for any enforcement action taken or imposed by Federal or State agencies, including the cost of fines, construction delays and remedial actions resulting from the contractor's failure to comply with all provisions of the NPDES permit.

1.04 JOB CONDITIONS

- A. Conditions existing at times of inspection for bidding purposes will be maintained by owner in so far as practical.
- B. Variations to conditions or discrepancy in actual conditions as they apply to site preparation operations are to be brought to the attention of the owner prior to the commencement of any site work.

PART 2 PRODUCTS

Not applicable.

PART 3 EXECUTION**3.01 PREPARATION**

Verify that existing plant life and clearing limits are clearly tagged, identified and marked in such manner as to insure their safety throughout construction operations.

3.02 PROTECTION

- A. Locate and identify existing utilities that are to remain and protect them from damage.
- B. Protect trees, plant growth and features designated to remain as final landscape.
- C. Conduct operations with minimal interference to public or private access and facilities. Maintain access and egress at all times and clean or sweep any roadways daily or as required by the governing authority. At such times as deemed necessary by the owner, dust control shall be provided with sprinkling systems or equipment provided by the contractor.
- D. Protect bench marks, property corners and all other survey monuments from damage or displacement. If a marker needs to be removed it shall be referenced by a Registered Professional Land Surveyor (RPLS), removed and replaced, as necessary, the same.
- E. Provide traffic control as required, in accordance with the U.S. Department of Transportation "Manual of Uniform Traffic Control Devices" and the state highway department requirements.

3.03 CLEARING

- A. Clear areas required for access to site and for execution of work.
- B. Unless otherwise indicated on the drawings, remove trees, shrubs, grass, other vegetation, improvements, or obstructions interfering with installation of new construction. Removal includes digging out stumps and roots. Depressions caused by clearing and grubbing operations are to be filled to subgrade elevation to avoid water ponding. Satisfactory fill material shall be placed in horizontal layers not exceeding 8" loose depth, and thoroughly compacted per fill requirements of this section and Section 31 00 00 - Earthwork.
- C. Remove grass, trees, plant life, stumps and all other construction debris from the site to a dump site that is suitable for handling such material according to state laws and regulations.

3.04 TOPSOIL EXCAVATION

- A. Strip topsoil from areas that are to be filled, excavated, landscaped and/or re-graded to such a depth that it prevents intermingling with underlying subsoil or questionable material.
- B. Cut heavy growths of grass from areas before stripping and remove with the rest of the cleared vegetative material.
- C. Topsoil shall consist of organic surficial soil found in depth of not less than 6". Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones and other objects over 2" in diameter, weeds, roots, and other objectionable material.

- D. Stockpile topsoil in storage piles in areas shown or where directed. Construct storage piles to freely drain surface water. Cover storage piles as required to prevent windblown dust. Dispose of unsuitable topsoil as specified for waste material., unless otherwise specified by owner. Excess topsoil shall be removed from the site by the Contractor unless specifically noted otherwise on the Drawings.

END OF SECTION 31 10 00

SECTION 31 11 00

CLEARING AND GRUBBING

PART 1 GENERAL

A. Site clearing and grubbing work includes, but is not limited to:

1. Removal of trees and other vegetation
2. Topsoil stripping and storing for regrading
3. Clearing and grubbing
4. Removing above-grade improvements
5. Removing below-grade improvements

B. Related work specified elsewhere

1. Earthwork - Section 31 00 00

C. Job conditions: traffic: conduct site clearing operations to insure minimal interference with roads, streets, walks and other adjacent occupied or used facilities. Do not close or obstruct streets, walks or other access to occupied or used facilities without permission from the owner.

D. Protection of existing improvements: provide the necessary protection to prevent damage to existing improvements indicated to remain in place.

1. Protect improvements on adjoining properties and owner's property.
2. Restore damaged improvements to their original condition as acceptable to the owner.

PART 2 EXECUTION

A. Site clearing: general: remove trees, shrubs, grass and other vegetation, improvements or obstructions interfering with the installation of new construction. Remove indicated items located elsewhere on the site or premises as specifically indicated. Removal includes digging out stumps and roots.

B. Carefully and cleanly cut roots and branches of trees indicated to be left standing where such roots and branches obstruct new construction.

C. Trees that are indicated to be removed and transplanted shall be balled and replanted on the site in such a way that the tree will survive, otherwise it will be replaced with an equal tree by the contractor.

D. Topsoil: topsoil is defined as friable clay loam surface soil found in a depth of not less than 4 inches. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones and other objects over 2 inches in diameter and without weeds, roots and other objectionable material.

1. Strip topsoil to whatever depths it is encountered to in a manner to prevent intermingling with underlying soils.
2. Remove heavy growths of grass from areas before stripping.
3. Stockpile topsoil in storage piles in the areas directed. Construct the storage pile as to freely drain surface water. Cover storage piles if required to prevent wind-blown dust. Do not stockpile more than five (5) feet in height without expressed written authority of owner's representative architect/engineer.

E. Disposal of unsuitable topsoil shall be the same as waste material as herein specified.

F. Clearing and grubbing: clear site of trees, shrubs and other vegetation except for those indicated to be left standing. Completely remove stumps, roots and other debris protruding through ground surface at least 2 feet below the lower elevation of the excavation. All holes remaining after clearing and grubbing shall be backfilled and tamped as directed by the engineer and the entire area shall be bladed to prevent ponding of water and to provide drainage except in areas to be immediately excavated. The engineer may direct that the holes not be backfilled.

1. Place fill material in horizontal layers not exceeding 6 inches loose depth and thoroughly compacted to a density equal to adjacent original ground.

G. Removal of improvements: remove existing above-grade and below-grade improvements not indicated to remain which is necessary to permit construction, and other work as required.

H. Disposal of waste materials: removal from owner's property and dispose of off the site in a manner satisfactory to the engineer and/or local governing authority.

I. Removal of concrete & asphalt: any part of existing sidewalks or pavement areas shown on the plans to be removed shall be done so in a neat and straight cut.

1. After the proposed work is complete, Type "D" HMA or Class "A" Concrete shall be used to patch the joints in a neat and smooth transition from the old material to the new work.

END OF SECTION 31 11 00

SECTION 31 14 11

EARTHWORK AND RELATED WORK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Protection, modification and/or installation of utilities as site work progresses paying particular attention to grade changes and any necessary staging of work.
- B. Cutting, filling and grading to required lines, dimensions, contours and proposed elevations for proposed improvements.
- C. Scarifying, compaction, drying and removal of unsuitable material to ensure proper preparation of areas for fills or proposed improvements.

1.02 RELATED SECTIONS

- A. Section 31 10 00 – Site Preparation
- B. Section 02 41 00 - Demolition
- C. Section 31 23 33 - Excavation, Backfill and Compaction for Utilities
- D. Section 31 23 00 - Excavation, Backfill and Compaction for Structures
- E. Section 31 23 16 - Excavation Backfill and Compaction for Pavement
- F. Geotechnical Report for findings of surface materials and conditions, and recommendations
- G. Construction Drawings
- H. All applicable Project Specifications as they relate specifically to the earthwork beneath the buildings, where the requirements are more stringent than the civil requirements.

1.03 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM) latest edition.
 - D 422 Method for Particle Size Analysis of Soils
 - D 698 Test for Moisture-Density Relations of Soils Using 5.5 lb. (2.5 kg) Rammer and 12 inch-inch (304.8 mm) Drop (Standard Proctor)
 - D 1556 Test for Density of soil in Place by the Sand Cone Method
 - D 1557 Test for Moisture-Density Relations of Soils Using 10-lb (4.5 kg) Rammer and 18-inch (457 mm) Drop (Modified Proctor)
 - D 1559 Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus
 - D 2167 Test for Density of Soil in Place by the Rubber Balloon Method
 - D 2216 Laboratory Determination of Moisture content of Soil
 - D 2487 Classification of Soils for Engineering Purposes
 - D 2922 Tests for Density of Soil and Soil - Aggregate in Place by Nuclear Methods (Shallow Depth)
 - D 3017 Test for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
 - D 4318 Test for Plastic Limit, Liquid Limit, and Plasticity Index of Soils

- C 25 Chemical Analysis of Limestone, Quicklime and Hydrate Lime
- C 110 Physical Testing for Quicklime and Hydrated Lime, Wet Sieve Method
- C 618 Specifications for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete
- C 977 Quicklime and Hydrated Lime for Soil Stabilization

- B. American Association of State Highway and Transportation Officials (AASHTO) latest edition
 - T 88 Mechanical Analysis of Soils

1.04 QUALITY ASSURANCE

- A. Independent Testing Laboratory paid by Contractor, unless otherwise stated in the contract, shall be retained to perform construction testing on site based on the following:
 - 1. Building Subgrade Areas, including 10'-0" Outside Exterior Building Lines: In cut areas, not less than one compaction test for every 2,500 square feet. In fill areas, same rate of testing for each 8" lift (measured loose)
 - 2. Areas of Construction exclusive of building subgrade: In cut areas, not less than one compaction test for every 10,000 square feet. In fill areas, same rate of testing for each 8" lift (measured loosed).
- B. If compaction requirements are not complied with at any time during construction process, remove and recompact deficient areas until proper compaction is obtained at no additional expense to owner. All retesting due to non-compliance shall be paid for by the contractor at no additional cost to the owner.
- C. In all areas to receive pavement, a CBR (or LBR) test shall be performed for each type of material imported from off-site.
- D. The following tests shall be performed on each type of on-site or imported soil material used as compacted fill as part of construction testing requirements.
 - 1. Moisture and Density Relationship: ASTM D 698 or ASTM D1557.
 - 2. Mechanical Analysis: AASHTO T-88
 - 3. Plasticity Index: ASTM D 4318
- E. Field density tests for in-place materials shall be performed according to one of the following standards as part of construction testing requirements.
 - 1. Sand-Cone Method: ASTM D 1556
 - 2. Ballon Method: ASTM D 2167
 - 3. Nuclear Method: ASTM D 2922 (Method B-Direct Transmission)
- F. Independent Testing Laboratory shall prepare test reports that indicate test location, elevation data, and test results. Owner, Engineer, and contractor shall be provided with copies of reports within 96 hours of time test was performed. In event that any test performed fails to meet these specifications, owner and contractor shall be notified immediately by the independent testing laboratory.
- G. All costs related to retesting due to failures shall be paid for by the contractor at no additional expense to owner. Owner reserves the right to employ an Independent

Testing Laboratory and to direct any retesting that is deemed necessary. Contractor shall provide free access to site for testing activities.

1.05 SUBMITTALS

- A. Submit a sample of each type of off-site fill materials that is to be used at the site in an air tight, 10 lb container for the testing laboratory.
- B. Submit the name of each material supplier and specific type and source of each material. Any change in source throughout the job requires approval of the engineer.
- C. For use of fabrics or geogrids, a design shall be submitted for approval by the Engineer.

PART 2 PRODUCTS

2.01 MATERIALS

- 1. Excavated and re-used material for subsoil fill as specified herein and deemed suitable for intended use by Geotechnical Engineer.
- 2. Imported subsoil material approved by the Engineer and specified herein and deemed suitable for intended use by Geotechnical Engineer.
- 3. Filter/Drainage Fabrics
 - a) Mirafi 140NS
 - b) Phillips 66 Supac 4NP
 - c) Dupont Tyvar 3341
 - d) Others as approved by Engineer

PART 3 EXECUTION

3.01 PREPARATION

- A. Identify required lines, levels, contours and datum. Locate and identify existing utilities that are to remain and protect them from damage. Coordinate with Section 01 71 23 Field Surveying.
- B. Notify utility companies to remove and/or relocate any utilities that are in conflict with the proposed improvements.
- C. Protect plant life, lawns, fences, existing structures, sidewalks, paving and curbs from excavating equipment and vehicular traffic.
- D. Protect benchmarks, property corners and all other survey monuments from damage or displacement. If a marker needs to be removed it shall be referenced by a licensed land surveyor and replaced, as necessary, by the same.
- E. Remove from site material encountered in grading operations that, in opinion of Engineer, Owner or owners representative, is unsuitable or undesirable for backfilling, subgrade or foundation purposes. Dispose of in a manner satisfactory to owner. Backfill areas with layers of suitable material and compact as specified.

- F. Prior to placing fill in low areas, such as previously existing creeks, ponds, or lakes, perform following procedures:
1. Drain water out by gravity with ditch having flow line lower than lowest elevation in low area. If drainage cannot be performed by gravity ditch, use adequate pump to obtain same results.
 2. After drainage of low area is complete, remove mulch, mud, debris, and other unsuitable material by using acceptable equipment and methods that will keep natural soils underlying low areas dry and undisturbed.
 3. If proposed for fill, all muck, mud, and other materials removed from above low areas shall be dried on-site by spreading in thin layers for observation by owner or owners representative. Material shall be inspected and, if found to be suitable for use as fill material, shall be incorporated into lowest elevation of site filling operation, but not under the building area or within 10'-0" of perimeter of building pad or paving subgrade. If, after observation by owner or owners representative, material is found to be unsuitable, all unsuitable material shall be removed from site.

3.02 EXCAVATING FOR FILLING AND GRADING

- A. Classification of Excavation: Contractor by submitting bid/price proposal acknowledges that he has investigated the site to determine type, quantity, quality, and character of excavation work to be performed. Excavation shall be considered unclassified excavation, except as indicated by "Article 4" - Administration of the Contract" in the "Supplementary Conditions" portion of the specification.
- B. Perform excavation using capable, well maintained equipment and methods acceptable to governing agencies.
- C. When performing grading operations during periods of wet weather, provide adequate drainage and ground water management to control moisture of soils.
- D. Shore, brace, and drain excavations as necessary to maintain safe, secure, and free of water at all times.
- E. Excavated material containing rock or stone greater than 6" in largest dimension is unacceptable as fill to within the proposed building and paving area.
- F. Rock or stone less than 6" in largest dimension is acceptable as fill to within 24" of surface of proposed subgrade when mixed with suitable material.
- G. Rock or stone less than 2" in largest dimension and mixed with suitable material is acceptable as fill within the upper 24" of proposed subgrade.

3.03 FILLING AND SUBGRADE PREPARATION

- A. Fill areas to contours and elevations shown with unfrozen materials.
- B. Place fill in continuous lifts specified herein.
- C. Refer to Section 31 23 33 for requirements for utilities.
- D. Refer to Section 31 23 16 for requirements for pavements.

- E. Areas exposed by excavation or stripping and on which subgrade preparations are to be performed shall be scarified to minimum depth of 8" and compacted to minimum of 95% of optimum density, in accordance with ASTM D698 (or 92% of optimum density, in accordance with ASTM D1557), at a moisture content of not less than 1% below and not more than 3% above the optimum moisture content. These areas shall then be proof-rolled to detect any areas of insufficient compaction. Proof-rolling shall be accomplished by making a minimum of two (2) complete passes with a fully-loaded tandem-axle dump truck, or approved equivalent, in each of the two perpendicular directions under the supervision and direction of a field geotechnical engineer. Areas of failure shall be excavated and recompacted as stated above.
- F. Fill materials used in preparation of subgrade shall be placed in lifts or layers not to exceed 8" loose measure and compacted to a minimum density of 95% of optimum density, in accordance with ASTM D 698, (or 92% of the optimum density, in accordance with ASTM D 1557) at a moisture content of not less than 1% below and not more than 3% above the optimum moisture content.
- G. Material imported from off-site shall have a CBR (California Bearing Ratio) or LBR (Limerock Bearing Ratio) value equal to or above the pavement design subgrade CBR or LBR value indicated on the Drawings.

3.04 MAINTENANCE OF SUBGRADE

- A. Finished subgrades shall be verified to ensure proper elevation and conditions for construction above subgrade.
- B. Protect subgrade from excessive wheel loading during construction, including concrete trucks and dump trucks.
- D. Remove areas of finished subgrade found to have insufficient compaction density to depth necessary and replace in manner that will comply with compaction requirements by use of material equal to or better than best subgrade material on site. Surface of subgrade after compaction shall be hard, uniform, smooth, stable, and true and cross-section.

3.05 RIP RAP (If Specified on Construction Drawings)

- A. Place rip-rap in all areas where indicated on the Drawings. The stone for rip-rap shall consist of field stone or rough unhewn quarry stone as nearly uniform, in section as is practical. The stones shall be dense, resistant to the action of air and water, and suitable in all aspects for the purpose intended. Unless otherwise specified, all stones used as rip-rap shall weigh between 50 and 150 pounds each, and at least 60 percent of the stones shall weigh more than 100 pounds each.
- B. Slopes and other areas to be protected shall be dressed to the line and grade shown on the plans prior to the placing of rip-rap. Contractor shall undercut the areas to receive rip-rap to an elevation equal to the final elevation less the average diameter of the stones before placing the rip-rap.
- C. Filter fabric and bedding stone shall be installed prior to the placement of the stone if so indicated on the drawings. The bedding stone shall be quarried and crushed angular limestone in accordance with Specifications and shall be 6" in depth. Filter fabric shall be as specified herein and as detailed on the plans.
- D. Stones shall be placed so that the greater portion of their weight is carried by the earth and not by the adjacent stones. The stones shall be placed in a single layer with close joints.

The upright areas of the stone shall make an angle of approximately 90 degree with the embankment upward, the larger stones being placed in the lower courses. Open joints shall be filled with spalls. Stones shall be embedded in the embankment as necessary to present a uniform top surface such that the variation between tops of adjacent stones shall not exceed three inches.

3.06 FINISH GRADING

- A. Grade all areas where finish grade elevations or contours are indicated on Drawings, other than paved areas and buildings, including excavated areas, filled and transition areas, and landscape areas. Graded areas shall be uniform and smooth, free from rock, debris, or irregular surface changes. Finished subgrade surface shall not be more than 0.10 feet above or below established finished subgrade elevation, and all ground surfaces shall vary uniformly between indicated elevations. Finished ditches shall be graded to allow for proper drainage without ponding and in a manner that will minimize erosion potential. For topsoil application, refer to Landscaping Sections and Specifications.
- B. Correct all settlement and eroded areas within one year after date of completion at no additional expense to owner. Bring grades to proper elevation. Replant or replace any grass, shrubs, bushes, or other vegetation that appears dead, dying or disturbed by construction activities. Refer to Section 01 57 23 for slope protection and erosion control.
- C. Refer to Section 31 32 13 for soil stabilization using lime, cement, fly ash and geotextile fabric methods for subbase materials.

END OF SECTION 31 14 11

SECTION 31 23 00

EXCAVATION AND FILL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Protection, modification and/or installation of utilities as site work progresses, paying particular attention to grade changes and any necessary staging of work.
- B. Cutting, filling and grading to required lines, dimensions, contours and proposed elevations for proposed improvements.
- C. Scarifying, compaction, drying and removal of unsuitable material to ensure proper preparation of areas for fills or proposed improvements.

1.02 RELATED SECTIONS

- A. Section 02 41 00 - Demolition
- B. Section 31 10 00 - Site Clearing
- C. Section 31 22 00 - Grading
- D. Geotechnical Report (if applicable) for boring locations and finding of surface materials and conditions
- E. Construction Drawings
- F. Architectural Plans and Specifications as they relate specifically to the earthwork beneath the buildings, where the architectural requirements are more stringent than the civil requirements.

1.03 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM) latest edition.
 - D 422 Method for Particle Size Analysis of Soils
 - D 698 Test for Moisture-Density Relations of Soils Using 5.5 lb. (2.5 kg) Rammer and 12 inch-inch (304.8 mm) Drop (Standard Proctor)
 - D 1556 Test for Density of soil in Place by the Sand Cone Method
 - D 1557 Test for Moisture-Density Relations of Soils Using 10-lb (4.5 kg) Rammer and 18-inch (457 mm) Drop (Modified Proctor)
 - D 1559 Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus
 - D 2167 Test for Density of Soil in Place by the Rubber Balloon Method
 - D 2216 Laboratory Determination of Moisture content of Soil
 - D 2487 Classification of Soils for Engineering Purposes
 - D 2922 Tests for Density of Soil and Soil - Aggregate in Place by Nuclear Methods (Shallow Depth)
 - D 3017 Test for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
 - D 4318 Test for Plastic Limit, Liquid Limit, and Plasticity Index of Soils
 - C 25 Chemical Analysis of Limestone, Quicklime and Hydrate Lime
 - C 110 Physical Testing for Quicklime and Hydrated Lime, Wet Sieve Method
 - C 618 Specifications for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a

Mineral Admixture in Portland Cement Concrete
C 977 Quicklime and Hydrated Lime for Soil Stabilization

- B. American Association of State Highway and Transportation Officials (AASHTO) latest edition
T 88 Mechanical Analysis of Soils

1.04 QUALITY ASSURANCE

- A. Independent Testing Laboratory paid by Contractor, shall be retained to perform construction testing on site based on the following:
1. Building Subgrade Areas, including 10'-0" Outside Exterior Building Lines: In cut areas, not less than one compaction test for every 2,500 square feet. In fill areas, same rate of testing for each 8" lift (measured loose)
 2. Areas of Construction exclusive of building subgrade: In cut areas, not less than one compaction test for every 10,000 square feet. In fill areas, same rate of testing for each 8" lift (measured loose).
- B. If compaction requirements are not complied with at any time during the construction process, remove and recompact any deficient areas until proper compaction is obtained at no additional expense to owner.
- C. In all areas to receive pavement, a CBR (or LBR) test shall be performed for each type of material imported from off-site.
- D. The following tests shall be performed on each type of on-site or imported soil material used as compacted fill as part of construction testing requirements.
1. Moisture and Density Relationship: ASTM D 698 or ASTM D1557.
 2. Mechanical Analysis: AASHTO T-88
 3. Plasticity Index: ASTM D 4318
- E. Field density tests for in-place materials shall be performed according to one of the following standards as part of construction testing requirements.
1. Sand-Cone Method: ASTM D 1556
 2. Balloon Method: ASTM D 2167
 3. Nuclear Method: ASTM D 2922 (Method B-Direct Transmission)
- F. Independent Testing Laboratory shall prepare test reports that indicate test location, elevation data, and test results. Owner, architect, and contractor shall be provided with copies of reports within 96 hours of time test was performed. In event that any test performed fails to meet these specifications, owner and contractor shall be notified immediately by independent testing laboratory.
- G. All costs related to retesting due to failures shall be paid for by the contractor at no additional expense to owner. Owner reserves the right to employ an Independent Testing Laboratory and to direct any retesting that is deemed necessary. Contractor shall provide free access to site for testing activities.

1.05 SUBMITTALS

- A. Submit a sample of each type of off-site fill materials that is to be used at the site in an air tight, 10 lb container for the testing laboratory.
- B. Submit the name of each material supplier and specific type and source of each material. Any change in source throughout the job requires approval of the owner or engineer.
- C. For use of fabrics or geogrids, a design shall be submitted for approval by the Engineer.

PART 2 PRODUCTS

2.01 MATERIALS

- 1. Excavated and re-used material for subsoil fill as specified herein.
- 2. Not Applicable.
- 3. Imported subsoil material approved by the owner and specified herein.
- 4. Not Applicable.
- 5. Filter/Drainage Fabrics
 - 1. Mirafi 140NS
 - 2. Phillips 66 Supac 4NP
 - 3. Dupont Tytar 3341

PART 3 EXECUTION

3.01 PREPARATION

- A. Identify required lines, levels, contours and datum. Locate and identify existing utilities that are to remain and protect them from damage.
- B. Notify utility companies to remove and/or relocate any utilities that are in conflict with the proposed improvements.
- C. Protect plant life, lawns, fences, existing structures, sidewalks, paving and curbs from excavating equipment and vehicular traffic.
- D. Protect benchmarks, property corners and all other survey monuments from damage or displacement. If a marker needs to be removed it shall be referenced by a licensed land surveyor and replaced, as necessary, by the same.
- E. Remove from site material encountered in grading operations that, in opinion of owner or owners representative, is unsuitable or undesirable for backfilling, subgrade or foundation purposes. Dispose of in a manner satisfactory to owner. Backfill areas with layers of suitable material and compact as specified.
- F. Prior to placing fill in low areas, such as previously existing creeks, ponds, or lakes, perform following procedures:

1. Drain water out by gravity with ditch having flow line lower than lowest elevation in low area. If drainage cannot be performed by gravity ditch, use adequate pump to obtain same results.
2. After drainage of low area is complete, remove mulch, mud, debris, and other unsuitable material by using acceptable equipment and methods that will keep natural soils underlying low areas dry and undisturbed.
3. If proposed for fill, all muck, mud, and other materials removed from above low areas shall be dried on-site by spreading in thin layers for observation by owner or owners representative. Material shall be inspected and, if found to be suitable for use as fill material, shall be incorporated into lowest elevation of site filling operation, but not under the building area or within 10'-0" of perimeter of building pad or paving subgrade. If, after observation by owner or owners representative, material is found to be unsuitable, all unsuitable material shall be removed from site.

3.02 EXCAVATING FOR FILLING AND GRADING

- A. Classification of Excavation: Contractor by submitting bid acknowledges that he has investigated the site to determine type, quantity, quality, and character of excavation work to be performed. Excavation shall be considered unclassified excavation, except as may be indicated by the Contract in the "Supplementary Conditions" portion of the specification.
- B. Perform excavation using capable, well maintained equipment and methods acceptable to owner and governing agencies.
- C. When performing grading operations during periods of wet weather, provide adequate drainage and ground water management to control moisture of soils.
- D. Shore, brace, and drain excavations as necessary to maintain the site safe, secure, and free of water at all times.
- E. Excavated material containing rock or stone greater than 6" in largest dimension is unacceptable as fill to within the proposed building and paving area.
- F. Rock or stone less than 6" in largest dimension is acceptable as fill to within 24" of surface of proposed subgrade when mixed with suitable material.
- G. Rock or stone less than 2" in largest dimension and mixed with suitable material is acceptable as fill within the upper 24" of proposed subgrade.

3.03 FILLING AND SUBGRADE PREPARATION

- A. Fill areas to contours and elevations shown with unfrozen materials.
- B. Place fill in continuous lifts specified herein.
- C. Refer to Section 31 23 00 for grading requirements for pavements.
- D. Areas exposed by excavation or stripping and on which subgrade preparations are to be performed shall be scarified to minimum depth of 8" and compacted to minimum of 95% of optimum density, in accordance with ASTM D698 (or 92% of optimum density, in accordance

with ASTM D1557), at a moisture content of not less than 1% below and not more than 3% above the optimum moisture content. These areas shall then be proofrolled to detect any areas of insufficient compaction. Proofrolling shall be accomplished by making a minimum of two (2) complete passes with a fully-loaded tandem-axle dump truck, or approved equivalent, in each of the two perpendicular directions under the supervision and direction of a field geotechnical engineer. Areas of failure shall be excavated and recompacted as stated above.

- E. Fill materials used in preparation of subgrade shall be placed in lifts or layers not to exceed 8" loose measure and compacted to a minimum density of 95% of optimum density, in accordance with ASTM D 698, (or 92% of the optimum density, in accordance with ASTM D 1557) at a moisture content of not less than 1% below and not more than 3% above the optimum moisture content.
- F. Material imported from off-site shall have a CBR (California Bearing Ratio) or LBR (Limerock Bearing Ratio) value equal to or above the pavement design subgrade CBR or LBR value indicated.

3.04 MAINTENANCE OF SUBGRADE

- A. Finished subgrades shall be verified to ensure proper elevation and conditions for construction above subgrade.
- B. Protect subgrade from excessive wheel loading during construction, including concrete trucks and dump trucks.
- D. Remove areas of finished subgrade found to have insufficient compaction density to depth necessary and replace in manner that will comply with compaction requirements by use of material equal to or better than best subgrade material on site. Surface of subgrade after compaction shall be hard, uniform, smooth, stable, and true to specified cross-section.

3.05 RIP RAP

- A. Place rip-rap in all areas where indicated on the Drawings. The stone for rip-rap shall consist of field stone or rough unhewn quarry stone as nearly uniform in section as is practical. The stones shall be dense, resistant to the action of air and water, and suitable in all aspects for the purpose intended. Unless otherwise specified, all stones used as rip-rap shall weigh between 50 and 150 pounds each, and at least 60 percent of the stones shall weigh more than 100 pounds each.
- B. Slopes and other areas to be protected shall be dressed to the line and grade shown on the plans prior to the placing of rip-rap. Contractor shall undercut the areas to receive rip-rap to an elevation equal to the final elevation less the average diameter of the stones before placing the rip-rap.
- C. Filter fabric and bedding stone shall be installed prior to the placement of the stone if so indicated on the drawings. The bedding stone shall be quarried and crushed angular limestone in accordance with Section 32 11 23 and shall be 6" in depth. Filter fabric shall be as specified herein and as detailed on the plans.
- D. Stones shall be placed so that the greater portion of their weight is carried by the earth and not by the adjacent stones. The stones shall be placed in a single layer with close joints. The upright areas of the stone shall make an angle of approximately 90 degree with the embankment upward, the larger stones being placed in the lower courses. Open joints shall be filled with spalls. Stones shall be embedded in the embankment as necessary to present

a uniform top surface such that the variation between tops of adjacent stones shall not exceed three inches.

3.06 FINISH GRADING

- A. Grade all areas where finish grade elevations or contours are indicated on Drawings, other than paved areas and buildings, including excavated areas, filled and transition areas, and landscape areas. Graded areas shall be uniform and smooth, free from rock, debris, or irregular surface changes. Finished subgrade surface shall not be more than 0.10 feet above or below established finished subgrade elevation, and all ground surfaces shall vary uniformly between indicated elevations. Finish ditches shall be graded to allow for proper drainage without ponding and in a manner that will minimize erosion potential. For topsoil application, refer to Landscaping Specifications.
- B. Correct all settlement and eroded areas within one year after date of completion at no additional expense to owner. Bring grades to proper elevation. Replant or replace any grass, shrubs, bushes, or other vegetation that appears dead, dying or disturbed by construction activities. Refer to Section 02270 for slope protection and erosion control.
- C. Refer to Section 31 32 00 for soil stabilization using lime, cement, fly ash and geotextile fabric methods for subbase materials.

END OF SECTION 31 23 00

SECTION 31 23 16

EXCAVATION

CONDITIONS OF THE CONTRACT AND DIVISION 1, as applicable, apply to this Section.

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Excavation for footings, slabs-on-grade, and utilities within the building.

1.02 RELATED REQUIREMENTS

- A. Section 31 00 00 – Earthwork: Fill materials, filling, and compacting.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.
- B. Locate, identify, and protect utilities that remain and protect from damage.

3.02 EXCAVATING

- A. Remove and discard existing top soil, subgrade, paving, and etc. to a depth indicated in the contract documents to a distance of 5 feet outside the building line.
- B. Excavate to accommodate new structures and construction operations.
- C. Notify the Architect of unexpected subsurface conditions and discontinue affected Work in are until notified to resume work.
- D. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored.
- E. Do not interfere with 45 degree bearing splay of foundations.
- F. Correct areas that are over-excavated and load-bearing surfaces that are disturbed.
- G. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- H. Remove excavated material that is unsuitable for re-use from site.
- I. Remove excess excavated material from site.

3.03 EXCAVATION FOR FOUNDATION AFTER FILL AND BACKFILL

- A. Excavate foundation beam trenches and widened beam footings to indicated elevations and dimensions.
 - 1. Trim bottoms to required lines and grades to leave solid base to receive other work.
 - 2. Remove loose material from excavations and from within the foundation lines.
- B. Remove excavated materials from within the foundation lines.
- C. Cut utility trenches wide enough to allow inspection of installed utilities.
 - 1. Hand trim excavations. Remove loose matter.

3.04 EXCAVATION SLOPING AND BENCHING

- A. If excavation extends to or below a depth of 5 feet below construction grade, the General Contractor shall be required to develop a trench safety plan to protect personnel entering the excavation vicinity.

3.05 FIELD QUALITY CONTROL

- A. Quality Requirements, for general requirements for field inspection and testing.
- B. Provide for visual inspection of load-bearing excavated surfaces before placement of foundations.

END OF SECTION 31 23 16

SECTION 31 31 16

TERMITE CONTROL

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Chemical soil treatment
- B. Termite Shields

1.02 REFERENCE STANDARDS

- A. Title 7, United States Code, 136 through 136y – Federal Insecticide, Fungicide and Rodenticide Act; United States Code; 1947 (Revised 2001).

1.03 SUBMITTALS

- A. See – Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate toxicants to be used, composition by percentage, dilution schedule, intended application rate.
- C. Test Reports: Indicate regulatory agency approval reports when required.
- D. Manufacturer's Application Instructions: Indicate caution requirements.
- E. Manufacturer's Certificate: Certify that toxicants meet or exceed specifies requirements.
- F. Warranty: Submit warranty and ensure that forms have been completed in **City of Edinburg**.

1.04 QUALITY ASSURANCE

1.05 REGULATORY REQUIREMENTS

- A. Conform to applicable code for requirements for application, and comply with EPA regulations.
- B. Provide certificate of compliance form authority having jurisdiction indicating approval of toxicants.

1.06 WARRANTY

- A. See – Closeout Submittals, for additional warranty requirements.
- B. Provide five year installer's warranty against damage to building caused by termites.

1.07 SUMMARY

- A. Provide soil treatment for termite control, as herein specified, prior to placement of vapor barrier under concrete work.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Manufacturers:
 - 1. Bayer Environmental Science Corp; Product____: www.nobugs.com.
 - 2. FMC Professional Solutions; Product____: www.fmcprosolutions.com.
 - 3. Syngenta Professional Products; Product____: www.syngentaprofessionalproducts.com.
 - 4. Substitutions: See Section 01 6000 – Product Requirements.
- B. Toxicant Chemical: EPA approved; synthetically color dyed to permit visual identification of treated soil.
- C. Diluent: Recommended by toxicant manufacturer.
- D. Metal termite shields for structural components which come into contact with the ground below suspended concrete slabs (not applicable for slab-on-grade conditions).

PART 3 - EXECUTION

3.01 APPLICATION

- A. Comply with requirements of U.S. EPA and applicable state and local codes.
- B. Spray apply toxicant in accordance with manufacturer's instructions.
- C. Apply toxicant at following locations:
- D. Apply extra treatment to structure penetration surfaces such as pipe or ducts, and soil penetrations such as grounding rods or posts.
- E. Install metal termite shields on foundation walls and footings at crawl spaces and basement areas.
- F. Re-treat disturbed treated soil with same toxicant as original treatment.
- G. If inspection or testing identifies the presence of termites, re-treat soil and re-test.

3.02 PROTECTION

- A. Do not permit soil grading over treated work.

3.03 APPROVAL

- A. Completion of pesticide approval form attached hereto is required for the completion of job.

END OF SECTION 31 31 16

SECTION 32 11 00

BASE COURSES

Part 1 GENERAL

1.01 SECTION INCLUDES

- A. Granular Base
- B. Caliche Base
- C. Full Depth Asphalt Base
- D. Hot-Mix Sand Asphalt Base
- E. Soil Cement Stabilized Base

1.02 RELATED SECTIONS

- A. Section 31 10 00 - Site Clearing
- B. Section 31 23 00 - Excavation and Fill
- C. Section 32 11 23 - Aggregate Base Courses
- D. Section 31 32 13.19 - Lime Soil Stabilization
- E. Section 32 12 16 - Asphalt Paving
- F. Section 32 13 13 - Concrete Paving
- G. Section 32 16 13 -Concrete Curbs and Gutters
- H. Section 32 92 23 - Sodding
- I. Construction Drawings

1.03 REFERENCES

- A. ANSI/ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 kg) Rammer and 12 inch (304.8 mm) Drop.
- B. ANSI/ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures using 10 lb (4.4 kg) Rammer and 18 inch (457 mm) Drop.
- C. ASTM D2167 - Test Method for Density and Unit Weight of Soil in-place by the Rubber Balloon Method.
- D. ASTM D1556 - Test Method for Density of Soil in-place by the Sand-Cone Method.
- E. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in-

place by Nuclear Methods (Shallow Depth), Method B (Direct Transmission).

F. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

PART 2 PRODUCTS

2.01 FILL MATERIALS

- A. Submit materials certificate to on-site independent testing laboratory which is signed by material producer and Contractor, certifying that material comply with, or exceed, the requirements herein.

PART 3 EXECUTION

3.01 EXAMINATION

Contractor shall verify that the subgrade has been inspected, tested and the gradients and elevations are correct, dry and properly prepared.

3.02 CONSTRUCTION

- A. Perform base course construction in a manner that will drain surface properly at all times and at the same time prevent runoff from adjacent areas from draining onto base course construction.
- B. Compact base material to not less than 98% of optimum density as determined by ASTM D 698 or 95% of optimum density, as determined by ASTM D 1557, unless otherwise indicated on the Drawings.
- C. Granular Base: Construct to thickness indicated on Drawings. Apply in lifts or layers not exceeding 8", measured loose.
- D. Caliche Base: Construct to thickness indicated on Drawings. Use Type A or B, Grades 1,2,or 3 caliche per TXDOT Spec. Item 247.
- E. Asphalt Institute Type IV mix for Full Depth Asphalt Base: Construct to thickness indicated on Drawings in lifts or layers not exceeding 3", measured loose.
- F. Asphalt Institute Type VI, VII, or VIII Mixes for Hot Mix Sand Asphalt Bases: Construct to thickness indicated on Drawings. Apply in lifts or layers not exceeding 3", measured loose.
- G. Soil Cement Stabilized Base: Construct to thickness and strength as indicated on Drawings and in accordance with applicable state highway specifications. If not indicated on the Drawings, the minimum compressive strength shall be 500 p.s.i., tested at 28 days.

3.03 FIELD QUALITY CONTROL

- A. An Independent Testing Laboratory, selected and paid by Owner, shall be retained to perform construction testing of in-place base courses for compliance with requirements for thickness, compaction, density and tolerance. Paving base course tolerances shall be verified (by rod and level readings on not more than fifty-foot centers) to be not more than 0.10 feet above design elevation which will allow for paving thicknesses as shown in the Drawings. Contractor shall provide instruments and suitable benchmark.

1. The following tests shall be performed on each type of material used as base course material:
 1. Moisture and Density Relationship: ASTM D 698 or ASTM D 1557.
 2. Mechanical Analysis: AASHTO T-88.
 3. Plasticity Index: ASTM D-4318.
 4. Base material thickness: Perform one test for each 20,000 square foot of in-place base material area.
 5. Base material compaction: Perform one test in each lift for each 20,000 square feet of in-place base material area.
 6. Test each course of base material for compliance with applicable state highway specifications.
- B. Field density tests for in-place materials shall be performed according to one of the following standards as part of construction testing requirements:
 1. San-Cone Method: ASTM D 1556.
 2. Balloon Method: ASTM D 2167.
 3. Nuclear Method: ASTM D 2922, Method B (Direct Transmission).
- D. Independent Testing Laboratory shall prepare test reports that indicate test location, elevation data, and test results. The Owner, Engineer, and Contractor shall be provided with copies of reports within 96 hours of time test was performed. In event that any test performed fails to meet these Specifications, the Owner, Engineer and Contractor shall be notified immediately by Independent Testing Laboratory. The Owner reserves right to employ Independent Testing Laboratory and to direct any testing that is deemed by them to be necessary. Contractor shall provide free access to site for testing activities.

END OF SECTION 32 11 00

SECTION 32 13 13

CONCRETE PAVING

Part 1 General

1.01 SECTION INCLUDES

Concrete, integral curbs, median barriers, parking areas and roads.

1.02 RELATED SECTIONS

- A. Section 31 10 00 - Site Clearing.
- B. Section 32 11 23 - Aggregate Base Courses.
- C. Section 32 11 00 - Base Courses.
- D. Section 32 16 13 - Curbs and Gutters.
- E. Section 32 17 23 - Pavement Markings.
- F. Section 03 30 00 - Cast-In-Place Concrete (See Architectural/Building Specifications)
- G. State Highway Department Standard Specifications.
- H. Construction Drawings.

1.03 REFERENCES

- A. ACI 301 - Specifications for Structural Concrete for Buildings.
- B. ACI 304 - Recommended Practice for Measuring, Mixing,
Transporting and Placing Concrete.
- C. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete.
- D. ANSI/ASTM A497 - Welded Deformed Steel Wire Fabric Concrete
Reinforcement.
- E. ANSI/ASTM D1751 - Preformed Expansion Joint Fillers for Concrete
Paving and Structural Construction.
- F. ANSI/ASTM D1752 - Preformed Sponge Rubber and Cork Expansion Joint
Fillers for Concrete Paving and Structural Construction.
- G. ASTM A615 - Deformed and Plain Billet-Steel for Concrete
Reinforcement.
- H. ASTM C33 - Concrete Aggregate.
- I. ASTM C94 - Ready Mix Concrete.
- J. ASTM C150 - Portland Cement.

- K. ASTM C260 - Air-Entraining Admixtures for Concrete.
- L. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
- M. ASTM C494 - Chemical Admixtures for Concrete.
- N. FS TT-C-800 - Curing Compound, Concrete, for New and Existing Surfaces.

1.05 PERFORMANCE REQUIREMENTS

- A. Contractor shall maintain access for vehicular and pedestrian traffic as required for other construction activities. Utilize temporary striping, flagmen, barricades, warning, signs, and warning lights as required.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Forms: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms of laminated boards to form radius bends as required. Coat forms with nonstaining type coating that will not discolor or deface surface of concrete.
- B. Welded Wire Mesh: Welded plain cold-drawn steel wire fabric, ASTM A185. Furnish in flat sheets, not rolls, unless otherwise acceptable to Owner.
- C. Reinforcing Bars: Deformed steel bars, ASTM A615, Grade 40.
- D. Concrete Materials: Comply with requirements of applicable Section 03 30 00 for concrete materials, admixtures, bonding materials, curing materials, and others as required.
- E. Joint Fillers: Resilient premolded bituminous impregnated fiberboard units complying with ASTM D 1751 FS HH-F341, Type II, Class A; or AASHTO M 153, Type I.
- F. Joint Sealants: Non-priming, pourable, self-leveling polyurethane. Acceptable sealants are Sonneborn "Sonolastic Paving Joint Sealant" Sonneborn. "Sonomeric CT 1 Sealant", Sonneborn "Sonomeric CT 2 Sealant", Mamemo "Vulken 45", or Woodmont Products "Chem-Caulk".

2.02 MIX DESIGN AND TESTING

- A. Concrete mix design and testing shall comply with requirements of applicable Section 03 30 00.
- B. Design mix to produce normal weight concrete consisting of Portland cement, aggregate, water reducing admixture, air-entraining admixture, and water to produce the following properties:
 - 1. Compressive Strength: 3,500 psi, minimum at 28 days, unless otherwise indicated on the Drawings.
 - 2. Slump Range: 3" - 5" at time of placement.

3. Air Entrainment: 5% to 8%.

PART 3 EXECUTION

3.01 PREPARATION

- A. Proof-roll prepared base material surface to check for unstable areas. The paving work shall begin after the unsuitable areas have been corrected and are ready to receive paving. Compaction testing for the base material shall be completed prior to the placement of the paving.

Surface Preparation: Remove loose material from compacted base material surface to produce a firm, smooth surface immediately before placing concrete.

3.02 INSTALLATION

A. Form Construction

1. Set forms to required grades and lines. Frames must be rigidly braced and secured.
2. Install sufficient quantity of forms to allow continuance of work and so that forms remain in place a minimum of 24 hours after concrete placement.
3. Check completed formwork for grade and alignment to following tolerances:

Top of forms not more than 1/8" in 10' - 0"
Vertical face on longitudinal axis, not more than 1/4" in 10'-0".

- B. Reinforcement: Locate, place and support reinforcement per applicable Section 03 30 00.

C. Concrete Placement

1. Comply with applicable requirements of Section 03 30 00.
2. Do not place concrete until base material and forms have been checked for line and grade. Moisten base material if required to provide uniform dampened condition at time concrete is placed. Concrete shall not be placed around manholes or other structures until they are at the required finish elevation and alignment.
3. Place concrete using methods which prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Consolidate with care to prevent dislocation of reinforcement, or side forms. Consolidated with care to prevent dislocation of reinforcing dowels, and joint devices.
4. Deposit and spread concrete in continuous operation between transverse joints, as far as possible. If interrupted for more than 1/2 hour, place construction joint.

- D. Joint Construction: Construct expansion, weakened-plane Control (contraction), and construction joints straight with face perpendicular to concrete surface. Construct transverse joints perpendicular to centerline, unless otherwise detailed.

1. Weakened-Plane Control (Contraction) Joints: Provide joints at a spacing of 15'-

0" o.c. maximum each way. Construct control joints for depth equal to at least 1/4 concrete thickness, as follows:

1. Form tooled joints in fresh concrete by grooving top portion with recommended tool and finishing with jointer.
 2. Form sawed joint using powered saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut joints into hardened concrete as soon as surface will not be torn, abraded, or otherwise damaged by cutting action.
2. Construction Joints: Place concrete joints at end of placements and at locations where placement operations are stopped for period of more than ½ hour, except where such placements terminate at expansion joints. Construct construction joints using standard metal keyway-section forms.
 3. Expansion Joints: Located expansion joints at 180'-0" o.c. maximum each way. Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks, and other fixed objects.
- E. Joint Fillers: Extend joint fillers the full-width and depth of joint, and not less than ½" or more than 1" below finished surface where joint sealer is indicated. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint filler sections together.
- F. Joint Sealants: All joints shall be sealed with approved exterior pavement joint sealants and shall be installed per manufacturer's recommendations.

3.03 CONCRETE FINISHING

- A. After striking off and consolidating concrete, smooth surface by screeding and floating to compact surface and produce uniform texture. After floating, test surface for trueness with 10'-0" straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide continuous smooth finish.
- B. Work edges of slabs, gutters, back top edge of integral curb, and formed joints with a edging tool, and round to ½" radius. Eliminate tool marks on concrete surface. After completion of floating and troweling when excess moisture or surface sheen has disappeared, complete surface finishing, as follow:
 1. Inclined slab surfaces: Provide coarse, nonslip finish by scoring surface with stiff-bristled broom perpendicular to line of traffic.
 2. Paving: Provide coarse, nonslip finish by scoring surface with stiff-bristled broom perpendicular of traffic.
- C. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point up any minor honeycombed areas. Remove and replace areas or sections with major defects, as directed.
- D. Protect and cure finished concrete paving using acceptable moist-curing method, more particularly described in the "water-curing" section of ACT 308-81.

3.04 CLEANING AND ADJUSTING

- A. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just prior to final inspection.
- B. Protect concrete form from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials.

3.05 FIELD QUALITY CONTROL

An independent testing laboratory shall randomly core the pavement at a minimum rate of one core per 20,000 square feet of pavement, with a minimum of 3 cores from heavy-duty areas and 3 cores from standard duty areas. Core shall be tested for thickness and quality of aggregate distribution. Core holes shall be patched immediately with Portland cement concrete conforming to Section 2.02 and shall be finished to provide a level surface conforming to Section 3.03 A & 3.03 B.

END OF SECTION 32 13 13

SECTION 32 16 12.01**SURFACE PREPARATION****DESCRIPTION**

1.1 This item shall consist of preparation of existing pavement surfaces for overlay, removal of existing pavement, and other miscellaneous items. The work shall be accomplished in accordance with these specifications and the applicable drawings.

EQUIPMENT

2.1 All equipment shall be specified hereinafter or as approved by the Engineer. The equipment shall not cause damage to the pavement to remain in place.

2.2 Equipment

A. The machine shall be capable of cutting a vertical edge without chipping or spalling the edges of the pavement to remain. The machine shall have a positive method of controlling the depth of cut. The Engineer shall layout the area to be milled. The area shall be laid out with straightedges in increments of 1-foot widths. The area to be milled shall cover only the failed area. Any excessive area that is milled because the Contractor doesn't have the appropriate machine, or areas that are damaged because of his negligence, shall not be included in the measurement for payment.

B. The machine shall have a minimum width of 6 feet. It shall be equipped with electronic grade control devices on both sides that will cut the surface to the grade and tolerances specified. The machine shall cut vertical edges. A positive method of dust control shall be provided. The machine shall be capable of discharging the millings in a truck or leaving them in a defined windrow.

C. Sweeper. Unless otherwise approved, use a street sweeper to remove cuttings and debris from the worked pavement.

CONSTRUCTION**3.1 REMOVAL OF EXISTING PAVEMENT.**

A. Asphaltic Concrete. Asphaltic concrete pavement to be removed shall be cut to the full depth of the bituminous material around the perimeter of the area to be removed. The pavement shall be removed in such a manner that the joint for each layer of pavement replacement is offset one foot from the joint in the preceding layer. This does not apply if the removed pavement is to be replaced with concrete or soil.

B. Concrete. The existing concrete to be removed shall be freed from the pavement to remain unless jackhammers are used for the complete removal. This shall be accomplished by line drilling or sawing through the complete depth of the slab one foot inside the perimeter of the final removal limits or outside the load transfer devices, whichever is greater. In this case, the limits of removal would be located on joints. If line drilling is used, the distance between holes shall not exceed the diameter of the hole. The pavement between the perimeter of the pavement removal and the saw cut or line-drilled holes shall be removed with a jackhammer. Where the perimeter of the removal limits is not located on the joint, the perimeter shall be saw cut 2 inches in depth or 1/4 the slab thickness, whichever is less. Again, the concrete shall be line drilled or saw cut the full depth of the pavement 6 inches inside the removal limits. The pavement inside the saw cut or line shall be broken by methods suitable to the Contractor; however, if the material is to be wasted on the airport site, it shall be reduced to a maximum size designated by the airport owner. The Contractor's removal operation shall not cause damage to cables, utility ducts, pipelines,

or drainage structures under the pavement. Any damage shall be repaired by the Contractor at no expense to the airport owner.

3.4 CONSTRUCTION

A. Grade Reference. When required. Place grade reference points at maximum intervals of 50ft. Use the control points to set the grade reference. Support the grade reference so the maximum deflection does not exceed 1/16 in. between supports.

B. Removal, Planing, Texturing. Vary the speed of the machine to leave a grid or other pattern type with discontinuous longitudinal reach. Remove the pavement surface for the length, depth, and width shown on the typical section and to the established line and grades. Remove pavement to the vertical lines adjacent to curbs, gutters, inlets, manholes, or other obstructions. Do not damage appurtenances and riding surface. Leave a uniform surface of concrete pavement free of asphalt materials when removing an asphaltic concrete overlay. Provide a pavement surface that has a smooth riding quality and is true to the established line and grades.

C. Edge Treatments. At the end of the day and for areas under traffic, slope vertical or near vertical longitudinal faces in the pavement surface in accordance with the requirements in the plans. Taper transverse faces to provide an acceptable ride.

D. Clean up. Sweep pavement and leave a clean pavement surface. All materials not indicated to be salvaged or remaining the property of the Owner, shall be hauled and properly disposed of.

The Engineer shall specify the depth of cold milling shown in the plans.

END OF SECTION 32 16 12.01

SECTION 34 41 16

TRAFFIC CONTROL EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

Traffic control signs complying with U.S. Department of Transportation, Federal Highway Administration's Manual "Uniform Traffic Control Devices" and as specified. See Construction Drawings for type, location, and quantity of sign required.

1.02 RELATED REQUIREMENTS:

1. Construction Drawings
2. Manufacturer's mounting instructions

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURER

Signs to be equivalent to those manufactured by SA-SO, Inc., Grand Prairie, Tx.

2.02 SIGNS

1. "STOPS" Signs: 24" x 24", Octagon, reflectorized copy and border.
2. "SPEED LIMIT 15" Signs: 12" x 24" , black legend on white reflective baked enamel background.
3. "HANDICAPPED SYMBOL" Signs: 12" x 18", White legend on blue reflective baked enamel background.
4. "NO PARKING, FIRE LANES" Signs: 12" x 18", red letters on white reflective or baked enamel background. (R7-8)
5. "KEEP RIGHT" Signs: 18" x 24", black letters and symbol on white reflective or baked enamel background. (R7-1)
6. "DO NOT ENTER" Signs: Highway Dept. Standard red and white sign except 24" x 24" size with reflective baked enamel finish.

2.03 POSTS

Round galvanized posts with galvanized sign-mounting hardware for each sign.

PART 3 EXECUTION

Install posts in 18" round x 24" deep concrete foundations. Set posts vertical and plumb with bottom of sign at 6'-5" above finish grade. Mount signs in accordance with manufacturer's instructions.

END OF SECTION 34 41 16

**TCEQ WATER DISTRIBUTION SYSTEM
GENERAL CONSTRUCTION NOTES**

1. This water distribution system must be constructed in accordance with the current Texas Commission on Environmental Quality (TCEQ) Rules and Regulations for Public Water Systems 30 Texas Administrative Code (TAC) Chapter 290 Subchapter D. When conflicts are noted with local standards, the more stringent requirement shall be applied. At a minimum, construction for public water systems must always meet TCEQ's "Rules and Regulations for Public Water Systems."
2. All newly installed pipes and related products must conform to American National Standards Institute (ANSI)/NSF International Standard 61 and must be certified by an organization accredited by ANSI [§290.44(a)(1)].
3. Plastic pipe for use in public water systems must bear the NSF International Seal of Approval (NSF-pw) and have an ASTM design pressure rating of at least 150 psi or a standard dimension ratio of 26 or less [§290.44(a)(2)].
4. No pipe which has been used for any purpose other than the conveyance of drinking water shall be accepted or relocated for use in any public drinking water supply [§290.44(a)(3)].
5. All water line crossings of wastewater mains shall be perpendicular [§290.44(e)(4)(B)].
6. Water transmission and distribution lines shall be installed in accordance with the manufacturer's instructions. However, the top of the water line must be located below the frost line and in no case shall the top of the water line be less than 24 inches below ground surface [§290.44(a)(4)].
7. The maximum allowable lead content of pipes, pipe fittings, plumbing fittings, and fixtures is 0.25 percent [§290.44(b)].
8. The contractor shall install appropriate air release devices with vent openings to the atmosphere covered with 16-mesh or finer, corrosion resistant screening material or an acceptable equivalent [§290.44(d)(1)].
9. The contractor shall not place the pipe in water or where it can be flooded with water or sewage during its storage or installation [§290.44(f)(1)].
10. When waterlines are laid under any flowing or intermittent stream or semi-permanent body of water the waterline shall be installed in a separate watertight pipe encasement. Valves must be provided on each side of the crossing with facilities to allow the underwater portion of the system to be isolated and tested [§290.44(f)(2)].
11. Pursuant to 30 TAC §290.44(a)(5), the hydrostatic leakage rate shall not to exceed the amount allowed or recommended by the most current AWWA formulas for PVS pipe, cast iron and ductile iron pipe. Include the formulas in the notes on the plans.
 - The hydrostatic leakage rate for polyvinyl chloride (PVC) pipe and appurtenance shall not exceed the amount allowed or recommended by formulas in America Water Works Association (AWWA) C-605 as required in 30 TAC §290.44(a)(5). Please ensure that the formula for this calculation is correct and most current formula is in use;

$$Q = \frac{LD \sqrt{P}}{148,000}$$

Where:

- Q = the quantity of makeup water in gallons per hour,
 - L = the length of the pipe section being tested, in feet,
 - D = the nominal diameter of the pipe in inches, and
 - P = the average test pressure during the hydrostatic test in pounds per square inch (psi).
- The hydrostatic leakage rate for ductile iron (DI) pipe and appurtenances shall not exceed the amount allowed or recommended by formulas in America Water Works Association (AWWA) C-600 as required in 30 TAC §290.44(a)(5). Please ensure that the formula for this calculation is correct and most current formula is in use;

$$L = \frac{SD \sqrt{P}}{148,000}$$

Where:

- L = the quantity of makeup water in gallons per hour,
 - S = the length of the pipe section being tested, in feet,
 - D = the nominal diameter of the pipe in inches, and
 - P = the average test pressure during the hydrostatic test in pounds per square inch (psi).
12. The contractor shall maintain a minimum separation distance in all directions of nine feet between the proposed waterline and wastewater collection facilities including manholes. If this distance cannot be maintained, the contractor must immediately notify the project engineer for further direction. Separation distances, installation methods, and materials utilized must meet §290.44(e)(1)-(4).
13. The separation distance from a potable waterline to a wastewater main or lateral manhole or cleanout shall be minimum of nine feet. Where the nine-foot separation distance cannot be achieved, the potable waterline shall be encased in a joint of at least 150 psi pressure class pipe at least 18 feet long and two nominal sizes larger than the new conveyance. The space around the carrier pipe shall be supported at five-foot intervals with spacers or be filled to the springline with washed sand. The encasement pipe shall be centered on the crossing and both ends sealed with cement grout or manufactured sealant [§290.44(e)(5)].
14. Fire hydrants shall not be installed within nine feet vertically or horizontally of any wastewater line, wastewater lateral, or wastewater service line regardless of construction [§290.44(e)(6)].
15. Suction mains to pumping equipment shall not cross wastewater mains, wastewater laterals, or wastewater service lines. Raw water supply lines shall not be installed within five feet of any tile or concrete wastewater main, wastewater lateral, or wastewater service line [§290.44(e)(7)].
16. Waterlines shall not be installed closer than ten feet to septic tank drainfields [§290.44(e)(8)].
17. The contractor shall disinfect the new waterlines in accordance with AWWA Standard C-651-14 or most recent, then flush and sample the lines before being placed into service. Samples shall be collected for microbiological analysis to check the effectiveness of the disinfection procedure which shall be repeated if contamination persists. A minimum of one sample for each 1,000 feet of completed waterline will be required or at the next available sampling point beyond 1,000 feet as designated by the design engineer [§290.44(f)(3)].
18. Dechlorination of disinfecting water shall be in strict accordance with current AWWA Standard C655-09 or most recent.

**TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
WATER STORAGE TANK
GENERAL CONSTRUCTION NOTES**

1. The water storage tank must be constructed in accordance with the current Texas Commission on Environmental Quality (TCEQ) Rules and Regulations for Public Water Systems 30 Texas Administrative Code (TAC) Chapter 290 Subchapter D. When conflicts are noted with local standards, the more stringent requirement shall be applied. At a minimum, construction for public water systems must always meet TCEQ's "Rules and Regulations for Public Water Systems."
2. All facilities for potable water storage shall be covered and designed, fabricated, erected, tested and disinfected in strict accordance with current American Water Works Association (AWWA) standards and shall be provided with the minimum number, size and type of roof vents, man ways, drains, sample connections, access ladders, overflows, liquid level indicators on-site, and other appurtenances as specified in these rules.
3. Disinfection of water storage facilities shall be in strict accordance with current AWWA Standard C652-11 or most recent.
4. Dechlorination of disinfecting water shall be in strict accordance with current AWWA Standard C655-09 or most recent.
5. Bolted tanks shall be designed, fabricated, erected and tested in strict accordance with current AWWA Standard D103. Welded tanks shall be designed, fabricated, erected and tested in strict accordance with current AWWA Standard D100. The roof of all metal tanks shall be designed and erected so that no water ponds at any point on the roof and, in addition, no area of the roof shall have a slope of less than 0.75 inch per foot. Concrete tank roofs shall be constructed in strict compliance with their respective WWA Standard.
6. Roof vents shall be installed in strict accordance with current AWWA standards and shall be equipped with approved screens to prevent entry of animals, birds, insects and heavy air contaminants. Screens shall be fabricated of corrosion resistant material and shall be 16 mesh or finer. Screens shall be securely clamped in place with stainless or galvanized bands or wires and shall be designed to withstand winds of not less than tank design criteria (unless specified otherwise by the engineer).
7. All roof openings shall be designed in accordance with current AWWA standards. If an alternate 30 inch diameter access opening is not provided in a storage tank, the primary roof access opening shall not be less than 30 inches in diameter. Other roof openings required only for ventilating purposes during cleaning, repairing or painting operations shall be not less than 24 inches in diameter or as specified by the licensed professional engineer. An existing tank without a 30-inch diameter access opening must be modified to meet this requirement when major repair or maintenance is performed on the tank. Each access opening shall have a raised curbing at least four inches in height with a lockable cover that overlaps the curbing at least two inches in a downward direction. Where necessary, a gasket shall be used to make a positive seal when the hatch is closed. All hatches shall remain locked except during inspections and maintenance.
8. Overflows shall be designed in strict accordance with current AWWA standards and shall terminate with a gravity-hinged and weighted cover, an elastomeric duckbill valve, or other approved device to prevent the entrance of insects and other nuisances. The cover shall fit tightly with no gap over 1/16 inches. If the overflow terminates at any point other than the ground level, it shall be located near enough and at a position accessible from a ladder or the balcony for inspection purposes. The overflow(s) shall be sized to handle the maximum possible fill rate without exceeding the capacity of the overflow(s). The discharge opening of the overflow(s) shall be above the surface of the ground and shall not be subject to submergence.

9. All clearwells and water storage tanks shall have a liquid level indicator located at the tank site. The indicator can be a float with moving target, an ultrasonic level indicator, or a pressure gauge calibrated in feet of water. If an elevated tank or standpipe has a float with moving target indicator, it must also have a pressure indicator located at ground level. Pressure gauges must not be less than three inches in diameter and calibrated at not more than two-foot intervals. Remote reading gauges at the owner's treatment plant or pumping station will not eliminate the requirement for a gauge at the tank site unless the tank is located at the plant or station.
10. Inlet and outlet connections shall be located so as to prevent short circuiting or stagnation of water. Clearwells used for disinfectant contact time shall be appropriately baffled.
11. Clearwells and potable water storage tanks shall be thoroughly tight against leakage, shall be located above the ground water table and shall have no walls in common with any other plant units containing water in the process of treatment. All associated appurtenances including valves, pipes and fittings shall be tight against leakage.
12. Each clearwell or potable water storage tank shall be provided with a means of removing accumulated silt and deposits at all low points in the bottom of the tank. Drains shall not be connected to any waste or sewage disposal system and shall be constructed so that they are not a potential agent in the contamination of the stored water.
13. All clear wells, ground storage tanks, standpipes, and elevated tanks shall be painted, disinfected, and maintained in strict accordance with current AWWA standards. However, no temporary coatings, wax grease coatings, or coating materials containing lead will be allowed. No other coatings will be allowed which are not approved for use (as a contact surface with potable water) by the United States Environmental Protection Agency (EPA), NSF International, or the United States Food and Drug Administration (FDA). All newly installed coating must conform to ANSI/NSF International Standard 61 and must be certified by an organization accredited by ANSI.
14. No tanks or containers shall be used to store potable water that has previously been used for any non-potable purpose. Where a used tank is proposed for use, a letter from the previous owner or owners must be submitted to the Commission which states the use of the tank.
15. Access manways in the riser pipe, shell area, access tube, bowl area or any other location opening directly into the water compartment shall be located in strict accordance with current AWWA standards. These openings shall not be less than 24 inches in diameter. However, in the case of a riser pipe or access tube of 36 inches in diameter or smaller, the access manway may be 18 inches times 24 inches with the vertical dimension not less than 24 inches. The primary access manway in the lower ring or section of a ground storage tank shall be not less than 30 inches in diameter. Where necessary, for any access manway which allows direct access to the water compartment, a gasket shall be used to make a positive seal when the access manway is closed.
16. Service pump installation taking suction from storage tanks shall provide automatic low water level cutoff devices to prevent damage to the pumps. The service pump circuitry shall also resume pumping automatically once the minimum water level is reached in the tank.
17. Pursuant to 30 TAC §290.44(b)(1), the maximum allowable lead content of pipes, pipe fittings, plumbing fittings, and fixtures is 0.25 percent.

LOS VENADOS BOOSTER STATION IMPROVEMENTS
RO ENGINEERING
PROJECT NO. 18012
APRIL 2019

TABLE OF CONTENTS

DIVISION 26 – ELECTRICAL

<u>Section</u>	<u>Title</u>
26 02 00	BASIC MATERIALS AND METHODS
26 03 00	DEMOLITION WORK
26 05 19	WIRE, CABLE AND RELATED MATERIALS
26 05 26	GROUNDING
26 05 33	RACEWAYS
26 27 26	WIRING DEVICES
26 28 16	SAFETY AND DISCONNECT SWITCH
26 51 00	LIGHTING FIXTURES

DIVISION 33 – UTILITIES

<u>Section</u>	<u>Title</u>
33 12 23	PUMPS & CONTROLS AND PACKAGE SYSTEMS

END OF TABLE OF CONTENTS

THE SEAL APPEARING ON THIS
DOCUMENT WAS AUTHORIZED BY
RENE R. OLIVAREZ, P.E. 102302
DATED 04/11/19




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SECTION 26 02 00 - BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all Work herein.
- B. The Contract Drawings indicate the extent and general arrangement of the systems. If any departure from the Contract Drawings are deemed necessary by the Contractor, details of such departures and the reasons therefore, shall be submitted to the Architect for approval as soon as practicable. No such departures shall be made without the prior written approval of the Architect.

1.02 SCOPE OF WORK

- A. The Work included under this Contract consists of the furnishing and installation of all equipment and material necessary and required to form the complete and functioning systems in all of its various phases, all as shown on the accompanying Drawings and/or described in these Specifications. The contractor shall review all pertinent drawings, including those of other contracts prior to commencement of Work.
- B. This Division requires the furnishing and installing of all items Specified herein, indicated on the Drawings or reasonably inferred as necessary for safe and proper operation; including every article, device or accessory (whether or not specifically called for by item) reasonably necessary to facilitate each system's functioning as indicated by the design and the equipment specified. Elements of the work include, but are not limited to, materials, labor, supervision, transportation, storage, equipment, utilities, all required permits, licenses and inspections. All work performed under this Section shall be in accordance with the Project Manual, Drawings and Specifications and is subject to the terms and conditions of the Contract.
- C. The approximate locations of Electrical items are indicated on the Drawings. These Drawings are not intended to give complete and accurate details in regard to location of outlets, apparatus, etc. Exact locations are to be determined by actual measurements at the building, and will in all cases be subject to the Review of the Owner or Engineer, who reserves the right to make any reasonable changes in the locations indicated without additional cost to the Owner.
- D. Items specifically mentioned in the Specifications but not shown on the Drawings and/or items shown on Drawings but not specifically mentioned in the Specifications shall be installed by the Contractor under the appropriate section of work as if they were both specified and shown.
- E. All discrepancies between the Contract Documents and actual job-site conditions shall be reported to the Owner or Engineer so that they will be resolved prior to the bidding, where this cannot be done at least 7 working days prior to bid; the greater or more costly of the discrepancy shall be bid. All labor and materials required to perform the work described shall be included as part of this Contract.
- F. It is the intention of this Section of the Specifications to outline minimum requirements to furnish the Owner with a turn-key and fully operating system in cooperation with other trades.

- G. It is the intent of the above "Scope" to give the Contractor a general outline of the extent of the Work involved; however, it is not intended to include each and every item required for the Work. Anything omitted from the "Scope" but shown on the Drawings, or specified later, or necessary for a complete and functioning heating, ventilating and air conditioning system shall be considered a part of the overall "Scope".
- H. The Contractor shall rough-in fixtures and equipment furnished by others from rough-in and placement drawings furnished by others. The Contractor shall make final connection to fixtures and equipment furnished by others.
- I. Contractor shall participate in the commissioning process; including but not limited to meeting attendance, completion of checklists and participation in functional testing.

1.03 RELATED SECTIONS

- A. General Conditions
- B. Supplementary Conditions
- C. Division One

1.04 COOPERATION WITH TRADES:

- A. Cooperation with trades of adjacent, related, or affected materials or operations shall be considered a part of this work in order to affect timely and accurate placing of work and bring together in proper and correct sequence, the work of such trades.

1.05 REFERENCES

- A. National Electrical Code (NEC)
- B. American Society for Testing and Materials (ASTM)
- C. Underwriter's Laboratories, Inc. (UL)
- D. Insulated Cable Engineer's Association (ICEA).
- E. National Electrical Manufacturer's Association (NEMA).
- F. Institute of Electrical and Electronic's Engineers (IEEE).
- G. American National Standards Institute (ANSI).
- H. National Fire Protection Association (NFPA).
- I. International Energy Conservation Code (IECC).

1.06 COMPLETE FUNCTIONING OF WORK:

- A. All work fairly implied as essential to the complete functioning of the electrical systems shown on the Drawings and Specifications shall be completed as part of the work of this Division unless specifically stated otherwise. It is the intention of the Drawings and Specifications to establish the types of the systems, but not set forth each item essential to the functioning of the system. In case of doubt as to the work intended, or in the event of amplification or clarification thereof, the Contractor shall call upon the Architect for

supplementary instructions, Drawings, etc.

- B. Contractor shall review all pertinent Drawings and adjust his work to all conditions shown there on. Discrepancies between Plans, Specifications, and actual field conditions shall be brought to the prompt attention of the Architect.
 - 1. Approximate location of transformers, feeders, branch circuits, outlets, lighting and power panels, outlets for special systems, etc., are indicated on the Drawings. However, the Drawings, do not give complete and accurate detailed locations of such outlets, conduit runs, etc., and exact locations must be determined by actual field measurement. Such locations will, at all times, be subject to the approval of the Architect.
 - 2. Communicate with the Architect and secure his approval of any outlet (light fixture, receptacle, switch, etc.) location about which there may be the least question. Outlets obviously placed in a location not suitable to the finished room or without specific approval, shall be removed and relocated when so directed by the Architect. Location of light fixtures shall be coordinated with reflected ceiling plans.
- C. Additional coordination with mechanical contractor may be required to allow adequate clearances of mechanical equipment, fixtures and associated appurtenances. Contractor to notify Architect and Engineer of unresolved clearances, conflicts or equipment locations.

1.07 SCHEMATIC NATURE OF CONTRACT DOCUMENTS

- A. The contract documents are schematic in nature in that they are only to establish scope and a minimum level of quality. They are not to be used as actual working construction drawings. The actual working construction drawings shall be the approved shop drawings.

1.08 CONTRACTOR'S QUALIFICATIONS

- A. An approved contractor for the work under this division shall be:
 - 1. A specialist in this field and have the personnel, experience, training, and skill, and the organization to provide a practical working system.
 - 2. Able to furnish evidence of having contracted for and installed not less than 3 systems of comparable size and type that have served their Owners satisfactorily for not less than 3 years.
 - 3. Perform work by persons qualified to produce workmanship of specified quality. Persons performing electrical work shall be required to be licensed. Onsite supervision, journeyman shall have minimum of journeyman license. Helpers, apprentices shall have minimum of apprentice license.

1.09 DATE OF FINAL ACCEPTANCE

- A. The date of final acceptance shall be the date of owner occupancy, or the date all punch list items have been completed or final payment has been received. Refer to Division One for additional requirements.
- B. The date of final acceptance shall be documented in writing and signed by the architect, owner and contractor.

1.10 DEFINITIONS AND SYMBOLS

- A. General Explanation: A substantial amount of construction and Specification language constitutes definitions for terms found in other Contract Documents, including Drawings which must be recognized as diagrammatic and schematic in nature and not completely descriptive of requirements indicated thereon. Certain terms used in Contract Documents are defined generally in this article, unless defined otherwise in Division 1.
- B. Definitions and explanations of this Section are not necessarily either complete or exclusive, but are general for work to the extent not stated more explicitly in another provision of the Contract Documents.
- C. Indicated: The term "Indicated" is a cross-reference to details, notes or schedules on the Drawings, to other paragraphs or schedules in the Specifications and to similar means of recording requirements in Contract Documents. Where such terms as "Shown", "Noted", "Scheduled", "Specified" and "Detailed" are used in lieu of "Indicated", it is for the purpose of helping the reader locate cross-reference material, and no limitation of location is intended except as specifically shown.
- D. Directed: Where not otherwise explained, terms such as "Directed", "Requested", "Accepted", and "Permitted" mean by the Architect or Engineer. However, no such implied meaning will be interpreted to extend the Architect's or Engineer's responsibility into the Contractor's area of construction supervision.
- E. Reviewed: Where used in conjunction with the Engineer's response to submittals, requests for information, applications, inquiries, reports and claims by the Contractor the meaning of the term "Reviewed" will be held to limitations of Architect's and Engineer's responsibilities and duties as specified in the General and Supplemental Conditions. In no case will "Reviewed" by Engineer be interpreted as a release of the Contractor from responsibility to fulfill the terms and requirements of the Contract Documents.
- F. Furnish: Except as otherwise defined in greater detail, the term "Furnish" is used to mean supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
- G. Install: Except as otherwise defined in greater detail, the term "Install" is used to describe operations at the project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance.
- H. Provide: Except as otherwise defined in greater detail, the term "Provide" is used to mean "Furnish and Install", complete and ready for intended use, as applicable in each instance.
- I. Installer: Entity (person or firm) engaged by the Contractor or its subcontractor or Sub-contractor for performance of a particular unit of work at the project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance. It is a general requirement that such entities (Installers) be expert in the operations they are engaged to perform.
- J. Imperative Language: Used generally in Specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by the Contractor. For clarity of reading at certain locations, contrasting subjective language is used to describe

responsibilities that must be fulfilled indirectly by the Contractor, or when so noted by other identified installers or entities.

- K. Minimum Quality/Quantity: In every instance, the quality level or quantity shown or specified is intended as minimum quality level or quantity of work to be performed or provided. Except as otherwise specifically indicated, the actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable tolerance limits. In complying with requirements, indicated or scheduled numeric values are either minimums or maximums as noted or as appropriate for the context of the requirements. Refer instances of uncertainty to Owner or Engineer via a request for information (RFI) for decision before proceeding.
- L. Abbreviations and Symbols: The language of Specifications and other Contract Documents including Drawings is of an abbreviated type in certain instances, and implies words and meanings which will be appropriately interpreted. Actual word abbreviations of a self explanatory nature have been included in text of Specifications and Drawings. Specific abbreviations and symbols have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of Specification requirements with notations on Drawings and in Schedules. These are frequently defined in Section at first instance of use or on a Legend and Symbol Drawing. Trade and industry association names and titles of generally recognized industry standards are frequently abbreviated. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of Contract Documents so indicate. Except as otherwise indicated, graphic symbols and abbreviations used on Drawings and in Specifications are those recognized in construction industry for indicated purposes. Where not otherwise noted symbols and abbreviations are defined by 1993 ASHRAE Fundamentals Handbook, chapter 34 "Abbreviations and Symbols", ASME and ASPE published standards.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.
- B. Deliver products to the project at such time as the project is ready to receive the equipment, pipe or duct properly protected from incidental damage and weather damage.
- C. Damaged equipment shall be promptly removed from the site and new, undamaged equipment shall be installed in its place promptly with no additional charge to the Owner.

1.12 SUBMITTALS

- A. Coordinate with Division 1 for submittal timetable requirements, unless noted otherwise within thirty (30) days after the Contract is awarded the Contractor shall submit a minimum of eight (8) complete bound sets of shop drawings and complete data covering each item of equipment or material. The first submittal of each item requiring a submittal must be received by the Architect or Engineer within the above thirty day period. The Architect or Engineer shall not be responsible for any delays or costs incurred due to excessive shop drawing review time for submittals received after the thirty (30) day time limit. The Architect and Engineer will retain one (1) copy each of all shop drawings for their files. Where full size drawings are involved, submit one (1) print and one (1) reproducible sepia or vellum in lieu of eight (8) sets. All literature pertaining to an item subject to Shop Drawing submittal shall be submitted at one time. A submittal shall not contain information from more than one Specification section, but may have a section subdivided into items or equipment as listed in each section. The Contractor may elect to

submit each item or type of equipment separately. Each submittal shall include the following items enclosed in a suitable binder:

1. A cover sheet with the names and addresses of the Project, Architect, MEP Engineer, General Contractor and the Subcontractor making the submittal. The cover sheet shall also contain the section number covering the item or items submitted and the item nomenclature or description.
 2. An index page with a listing of all data included in the Submittal.
 3. A list of variations page with a listing all variations, including unfurnished or additional required accessories, items or other features, between the submitted equipment and the specified equipment. If there are no variations, then this page shall state "NO VARIATIONS". Where variations affect the work of other Contractors, then the Contractor shall certify on this page that these variations have been fully coordinated with the affected Contractors and that all expenses associated with the variations will be paid by the submitting Contractor. This page will be signed by the submitting Contractor.
 4. Equipment information including manufacturer's name and designation, size, performance and capacity data as applicable. All applicable Listings, Labels, Approvals and Standards shall be clearly indicated.
 5. Dimensional data and scaled drawings as applicable to show that the submitted equipment will fit the space available with all required Code and maintenance clearances clearly indicated and labeled at a minimum scale of 1/4" = 1'-0", as required to demonstrate that the alternate or substituted product will fit in the space available.
 6. Identification of each item of material or equipment matching that indicated on the Drawings.
 7. Sufficient pictorial, descriptive and diagrammatic data on each item to show its conformance with the Drawings and Specifications. Any options or special requirements or accessories shall be so indicated. All applicable information shall be clearly indicated with arrows or another approved method.
 8. Additional information as required in other Sections of this Division.
 9. Certification by the General Contractor and Subcontractor that the material submitted is in accordance with the Drawings and Specifications, signed and dated in long hand. Submittals that do not comply with the above requirements shall be returned to the Contractor and shall be marked "**REVISE AND RESUBMIT**".
- B. Refer to Division 1 for additional information on shop drawings and submittals.
- C. Equipment and materials submittals and shop drawings will be reviewed for compliance with design concept only. It will be assumed that the submitting Contractor has verified that all items submitted can be installed in the space allotted. Review of shop drawings and submittals shall not be considered as a verification or guarantee of measurements or building conditions.
- D. Where shop drawings and submittals are marked "**REVIEWED**", the review of the submittal does not indicate that submittals have been checked in detail nor does it in any way relieve the Contractor from his responsibility to furnish material and perform work as required by the Contract Documents.
- E. Shop drawings shall be reviewed and returned to the Contractor with one of the following categories indicated:
1. **REVIEWED:** Contractor need take no further submittal action, shall include this submittal in the O&M manual and may order the equipment submitted on.

2. **REVIEWED AS NOTED:** Contractor shall submit a letter verifying that required exceptions to the submittal have been received and complied with including additional accessories or coordination action as noted, and shall include this submittal and compliance letter in the O&M manual. The contractor may order the equipment submitted on at the time of the returned submittal providing the Contractor complies with the exceptions noted.
 3. **NOT APPROVED:** Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is not approved, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or drawings. Contractor shall not order equipment that is not approved. Repetitive requests for substitutions will not be considered.
 4. **REVISE AND RESUBMIT:** Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked revise and resubmit, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or provide as noted on previous shop drawings. Contractor shall not order equipment marked revise and resubmit. Repetitive requests for substitutions will not be considered.
 5. **CONTRACTOR'S CERTIFICATION REQUIRED:** Contractor shall resubmit submittal on material, equipment or method of installation. The Contractor's stamp is required stating the submittal meets all conditions of the contract documents. The stamp shall be signed by the General Contractor. The submittal will not be reviewed if the stamp is not placed and signed on all shop drawings.
 6. **MANUFACTURER NOT AS SPECIFIED:** Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked manufacturer not as specified, the Contractor will automatically be required to furnish the product, material or method named in the specifications. Contractor shall not order equipment where submittal is marked manufacturer not as specified. Repetitive requests for substitutions will not be considered.
- F. Materials and equipment which are purchased or installed without shop drawing review shall be at the risk of the Contractor and the cost for removal and replacement of such materials and equipment and related work which is judged unsatisfactory by the Owner or Engineer for any reason shall be at the expense of the Contractor. The responsible Contractor shall remove the material and equipment noted above and replace with specified equipment or material at his own expense when directed in writing by the Architect or Engineer.
- G. Shop Drawing Submittals shall be complete and checked prior to submission to the Engineer for review.
- H. Furnish detailed shop drawings, descriptive literature, physical data and a specification critique for each section indicating "compliance" and/or "variations" for the following items:
- Distribution Panelboards
 - Lighting and Appliance Panelboards
 - Wiring Gutters
 - Heavy Duty Disconnect Switches
 - Lighting Fixtures
 - Lighting Contactors
 - Time Clocks
 - Lighting Control System
 - Photocells
 - Wiring Devices and Plates

Conduit and Fittings
Wire
Switchboards

Harmonic Mitigating Type Transformers
Emergency Generator
Automatic Transfer Switches
Sound Reinforcing System
Fire Alarm System
Surge Protection Device (SPD)

- I. Refer to each specification section for additional requirements.

1.13 OPERATION AND MAINTENANCE MANUALS

- A. Prepare maintenance manuals in accordance with Division 1 and in addition to the requirements specified in Division 1, include the following information for equipment items:
1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
 2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
 3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
 4. Servicing instructions and lubrication charts and schedules.

1.14 COORDINATION DRAWINGS

- A. Prepare coordination drawings to a scale of 1/4"=1'-0" or larger; detailing major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:
1. Indicate the proposed locations of pipe, duct, equipment, and other materials. Include the following:
 - a. Wall and type locations.
 - b. Clearances for installing and maintaining insulation.
 - c. Locations of light fixtures and sprinkler heads.
 - d. Clearances for servicing and maintaining equipment, including tube removal, filter removal, and space for equipment disassembly required for periodic maintenance.
 - e. Equipment connections and support details.
 - f. Exterior wall and foundation penetrations.
 - g. Routing of storm and sanitary sewer piping.
 - h. Fire-rated wall and floor penetrations.
 - i. Sizes and location of required concrete pads and bases.
 - j. Valve stem movement.
 - k. Structural floor, wall and roof opening sizes and details.

2. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
 3. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.
 4. Prepare reflected ceiling plans to coordinate and integrate installations, air distribution devices, light fixtures, communication systems components, and other ceiling-mounted items.
- B. This Contractor shall be responsible for coordination of all items that will affect the installation of the work of this Division. This coordination shall include, but not be limited to: voltage, ampacity, capacity, electrical and piping connections, space requirements, sequence of construction, building requirements and special conditions.
- C. By submitting shop drawings on the project, this Contractor is indicating that all necessary coordination has been completed and that the systems, products and equipment submitted can be installed in the building and will operate as specified and intended, in full coordination with all other Contractors and Subcontractors.

1.15 RECORD DRAWINGS

1. Maintain a continuous record during the course of construction of all changes and deviations in the work from the contract drawings. Upon completion of the work, purchase a set of "Auto Positive Tracings" on vellum and make corrections as required to reflect the electrical systems as installed. Location and size of all conduit shall be accurately shown to dimension. Submit three prints of the tracings for approval. Make corrections to tracings as directed and deliver "Auto Positive Tracings" to the Architect. Record drawings shall be furnished in addition to shop drawings. Symbols on the Record drawings shall correspond to the identification symbols on the contract drawings and equipment identification plates and tags.
2. The Contractor shall maintain a set of clearly marked black line record "AS-BUILT" prints on the job site on which he shall mark all work details, alterations to meet site conditions and changes made by "Change Order" notices. These shall be kept available for inspection by the Owner, Architect or Engineer at all times.
3. Refer to Division 1 for additional requirements concerning record drawings. If the Contractor does not keep an accurate set of as-built drawings, the pay request may be altered or delayed at the request of the Architect. Mark the drawings with a colored pencil. Delivery of as-built prints and reproducibles is a condition of final acceptance.
4. The record prints shall be updated on a daily basis and shall indicate accurate dimensions for all buried or concealed work, precise locations of all concealed pipe or duct, locations of all concealed valves, controls and devices and any deviations from the work shown on the Construction Documents which are required for coordination. All dimensions shall include at least two dimensions to permanent structure points.
5. Submit three prints of the tracings for approval. Make corrections to tracings as directed and delivered "Auto Positive Tracings" to the architect. "As-Built" drawings shall be furnished in addition to shop drawings.
6. When the option described in paragraph F., above is not exercised then upon completion of the work, the Contractor shall transfer all marks from the submit a set of clear concise set of reproducible record "AS-BUILT" drawings and shall submit the reproducible drawings with corrections made by a competent draftsman and three (3) sets of black line

prints to the Architect or Engineer for review prior to scheduling the final inspection at the completion of the work. The reproducible record "AS-BUILT" drawings shall have the Engineers Name and Seal removed or blanked out and shall be clearly marked and signed on each sheet as follows:

CERTIFIED RECORD DRAWINGS

DATE:

(NAME OF GENERAL CONTRACTOR)

BY: _____
(SIGNATURE)

(NAME OF SUBCONTRACTOR)

BY: _____
(SIGNATURE)

1.16 CERTIFICATIONS AND TEST REPORTS

- A. Submit a detailed schedule for completion and testing of each system indicating scheduled dates for completion of system installation and outlining tests to be performed and schedule date for each test. This detailed completion and test schedule shall be submittal at least 90 days before the projected Project completion date.
- B. Test result reporting forms shall be submitted for review no later than the date of the detailed schedule submitted.
- C. Submit 4 copies of all certifications and test reports to the Architect or Engineer for review adequately in advance of completion of the Work to allow for remedial action as required to correct deficiencies discovered in equipment and systems.
- D. Certifications and test reports to be submitted shall include, but not be limited to those items outlined in Section of Division 26.

1.17 MAINTENANCE MANUALS

- A. Coordinate with Division 1 for maintenance manual requirements, unless noted otherwise bind together in "D ring type" binders by National model no. 79-883 or equal, binders shall be large enough to allow 1/4" of spare capacity. Three (3) sets of all approved shop drawing submittals, fabrication drawings, bulletins, maintenance instructions, operating instructions and parts exploded views and lists for each and every piece of equipment furnished under this Specification. All sections shall be typed and indexed into sections and labeled for easy reference and shall utilize the individual specification section numbers shown in the Electrical Specifications as an organization guideline. Bulletins containing information about equipment that is not installed on the project shall be properly marked up or stripped and reassembled. All pertinent information required by the Owner for proper operation and maintenance of equipment supplied by Division 26 shall be clearly and legibly set forth in memoranda that shall, likewise, be bound with bulletins.
- B. Prepare maintenance manuals in accordance with Special Project Conditions, in addition to the requirements specified in Division 26, include the following information for equipment items:

1. Identifying names, name tags designations and locations for all equipment.
 2. Fault Current calculations and Coordination Study.
 3. Reviewed shop drawing submittals with exceptions noted compliance letter.
 4. Fabrication drawings.
 5. Equipment and device bulletins and data sheets clearly highlighted to show equipment installed on the project and including performance curves and data as applicable, i.e., description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and model numbers of replacement parts.
 6. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
 7. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions, servicing instructions and lubrication charts and schedules.
 8. Equipment name plate data.
 9. Wiring diagrams.
 10. Exploded parts views and parts lists for all equipment and devices.
 11. Color coding charts for all painted equipment and conduit.
 12. Location and listing of all spare parts and special keys and tools furnished to the Owner.
 13. Furnish recommended lubrication schedule for all required lubrication points with listing of type and approximate amount of lubricant required.
- C. Refer to Division 1 for additional information on Operating and Maintenance Manuals.
- D. Operating and Maintenance Manuals shall be turned over to the Owner or Engineer a minimum of 14 working days prior to the beginning of the operator training period.

1.18 OPERATOR TRAINING

- A. The Contractor shall furnish the services of factory trained specialists to instruct the Owner's operating personnel. The Owner's operator training shall include 12 hours of on site training in three 4 hour shifts.
- B. Before proceeding with the instruction of Owner Personnel, prepare a typed outline in triplicate, listing the subjects that will be covered in this instruction, and submit the outline for review by the Owner. At the conclusion of the instruction period obtain the signature of each person being instructed on each copy of the reviewed outline to signify that he has a proper understanding of the operation and maintenance of the systems and resubmit the signed outlines.
- C. Refer to other Division 26 Sections for additional Operator Training requirements.

1.19 SITE VISITATION

- A. Visit the site of the proposed construction in order to fully understand the facilities, difficulties and restriction attending the execution of the work.
- B. Before submitting a bid, it will be necessary for each Contractor whose work is involved to visit the site and ascertain for himself the conditions to be met therein in installing his work and make due provision for same in his bid. It will be assumed that this Contractor in submitting his bid has visited the premises and that his bid covers all work necessary to

properly install the equipment shown. Failure on the part of the Contractor to comply with this requirement shall not be considered justification for the omission or faulty installation of any work covered by these Specifications and Drawings.

- C. Understand the existing utilities from which services will be supplied; verify locations of utility services, and determine requirements for connections.
- D. Determine in advance that equipment and materials proposed for installation fit into the confines indicated.

1.20 WARRANTY

- A. The undertaking of the work described in this Division shall be considered equivalent to the issuance, as part of this work, of a specific guarantee extending one year beyond the date of completion of work and acceptance by Owner, against defects in materials and workmanship. Materials, appliances and labor necessary to effect repairs and replacement so as to maintain said work in good functioning order shall be provided as required. Replacements necessitated by normal wear in use or by Owner's abuse are not included under this guarantee.
- B. All normal and extended warranties shall include parts, labor, miscellaneous materials, travel time, incidental expenses, freight/shipping, refrigerant, oils, lubricants, belts, filters and any expenses related to service call required to diagnose warranty problems.

1.21 TRANSFER OF ELECTRONIC FILES

- A. Project documents are not intended or represented to be suitable for reuse by Architect/Owner or others on extensions of this project or on any other project. Any such reuse or modification without written verification or adaptation by Engineer, as appropriate for the specific purpose intended, will be at Architect/Owner's risk and without liability or legal exposure to Engineer or its consultants from all claims, damages, losses and expense, including attorney's fees arising out of or resulting thereof.
- B. Because data stored in electric media format can deteriorate or be modified inadvertently, or otherwise without authorization of the data's creator, the party receiving the electronic files agrees that it will perform acceptance tests or procedures within sixty (60) days of receipt, after which time the receiving party shall be deemed to have accepted the data thus transferred to be acceptable. Any errors detected within the sixty (60) day acceptance period will be corrected by the party delivering the electronic files. Engineer is not responsible for maintaining documents stored in electronic media format after acceptance by the Architect/Owner.
- C. When transferring documents in electronic media format, Engineer makes no representations as to the 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 Engineer at the beginning of the Project.
- D. Any reuse or modifications will be Contractor's sole risk and without liability or legal exposure to Architect, Engineer or any consultant.
- E. The Texas Board of Architectural Examiners (TBAE) has stated that it is in violation of Texas law for persons other than the Architect of record to revise the Architectural drawings without the Architect's written consent.

It is agreed that "MEP" hard copy or computer-generated documents will not be issued to any other party except directly to the Architect/Owner. The contract documents are contractually copyrighted and cannot be used for any other project or purpose except as specifically indicated in AIA B-141 Standard Form of Agreement Between Architect and Owner.

If the client, Architect/Owner, or developer of the project requires electronic media for "record purposes", then an AutoCAD based compact disc ("CD") will be prepared. The "CD" will be submitted with all title block references intact and will be formatted in a "plot" format to permit the end user to only view and plot the drawings. Revisions will not be permitted in this configuration.

- F. At the Architect/Owner's request, Engineer will prepare one "CD" of electronic media to assist the contractor in the preparation of submittals. The Engineer will prepare and submit the "CD" to the Architect/Owner for distribution to the contractor. All copies of the "CD" will be reproduced for a cost of reproduction fee of Five Hundred Dollars (\$500.00) per "CD".

The "CD" will be prepared and all title blocks, names and dates will be removed. The "CD" will be prepared in a ".dwg" format to permit the end user to revise the drawings.

- G. This Five Hundred Dollars (\$500.00) per "CD" cost of reproduction will be paid directly from the Contractor to the Engineer. The "CD" will be prepared only after receipt of the Five Hundred Dollars (\$500.00). The Five Hundred Dollars (\$500.00) per "CD" cost of reproduction is to only recover the cost of the manhours necessary to reproduce the documents. It is not a contractual agreement between the Contractor and Engineer to provide any engineering services, nor any other service.

PART 2 - PRODUCTS

2.01 SUBSTITUTIONS

- A. The names and manufacturers and model numbers have been used in the Contract documents to establish types of equipment and standards of quality. Where more than one manufacturer is named for a specific item of equipment, only one of the specified manufacturers will be considered for approval. Where only one manufacturer is mentioned with the phrase "or approved equal", Contractor may submit an alternate manufacturer for consideration, provided the following conditions are met:

1. Submit alternate equipment with complete descriptive data in shop drawing form. Provide sample of equipment upon request for review by Architect. Samples will be returned if requested in writing.
2. Alternate equipment must be equal from the standpoint of materials, construction and performance.
3. Alternate submittal must be presented to the Engineer/Architect ten (10) days prior to bid date for approval.

- B. The Architect and Engineer shall be the sole judge of quality and equivalence of equipment, materials and methods.

2.02 All materials and products used on this project shall be listed by Underwriters' Laboratories.

2.03 ACCESS DOORS

- A. Wherever access is required in walls or ceilings to concealed junction boxes, pull boxes,

equipment, etc., installed under this Division, furnish a hinged access door and frame with flush latch handle to another Division for installation. Doors shall be as follows:

1. Plaster Surfaces: Milcor Style K.
2. Ceramic Tile Surfaces: Milcor Style M.
3. Drywall Surfaces: Milcor Style DW.
4. Install panels only in locations approved by the Architect.

2.04 EQUIPMENT PADS

- A. Unless noted otherwise 4" high concrete pads for floor mounted equipment shall be installed under Division 3. Pads shall conform to the shape of the equipment with a minimum of 3" margin at equipment supports. Top and sides of pads shall be troweled to a smooth finish, equal to floor. External corners shall be bullnosed to a 3/4" radius, unless shown otherwise.

2.05 ESCUTCHEONS

- A. Provide heavy chrome or nickel plated plates, of approved pattern, on conduit passing through walls, floors and ceilings in finished areas. Where conduit passes through a sleeve, no point of the conduit shall touch the building construction. Caulk around such conduit with sufficient layers of two hour rated firesafing by Thermafiber 4.0 P.C.F. density, U.S.G. fire test 4/11/78 and seal off openings between conduit and sleeves with non-hardening mastic prior to application of escutcheon plate. Escutcheons shall be Gravler Sure-Lock, or approved equal.

2.06 SPACE LIMITATIONS

- A. Equipment shall be chosen which shall properly fit into the physical space provided and shown on the drawings, allowing ample room for access, servicing, removal and replacement of parts, etc. Adequate space shall be allowed for clearances in accordance with Code requirements. Physical dimensions and arrangement of equipment shall be subject to the approval of the Architect.

2.07 PAINTING

- A. All factory assembled equipment for electrical work, except light fixtures, that normally is delivered with a factory applied finish shall be delivered with a hard surface factory applied finish such as baked-on machinery enamel which will not require additional field painting. The finish shall consist of not less than 2 coats of medium gray color paint USA No. 61 Munsell Notation 8-3G, 6. 10/0.54 enamel. This Contractor shall protect this finish from damage due to construction operations until acceptance of the building. He shall be responsible for satisfactorily restoring any such finishes or replacing equipment that becomes stained or damaged.

2.08 ELECTRICAL SYSTEM IDENTIFICATION

- A. Conduit Systems: Provide adequate marking of major conduit which is exposed or concealed in accessible spaces to distinguish each run as either a power or signal/communication conduit. Except as otherwise indicated, use orange banding with black lettering. Provide self-adhesive or snap-on type plastic markers. Indicate voltage for that raceway. Locate markers at ends of conduit runs, on pull boxes, on junction boxes, near switches and other control devices, near items of equipment served by the conductors, at points where conduit passes through walls or floors, or enters non-accessible construction and at spacings of not more than 50 feet along each run of

conduit. Switch-leg conduit and short branches for power connections do not have to be marked, except where conduit is larger than $\frac{3}{4}$ inch. Branch circuit conduits, junction boxes and pull boxes shall be marked with a permanent marker indicating panel name and branch circuit numbers.

- B. Underground Cable Identification: Bury a continuous, preprinted, bright colored plastic ribbon cable marker with each underground cable (or group of cables), regardless of whether conductors are in conduit, duct bank, or direct buried. Locate each directly over cables, 6 to 8 inches below finished grade.
- C. Identification of Equipment:
 - 1. All major equipment shall have a manufacturer's label identifying the manufacturer's address, equipment model and serial numbers, equipment size, and other pertinent data. Care shall be taken not to obliterate this nameplate in any way.
 - 2. A black-white-black laminated plastic engraved identifying nameplate shall be secured by stainless steel screws to each automatic transfer switch, switchboard, distribution panel, motor control center, motor starter panels and panelboards.
 - a. Identifying nameplates shall have $\frac{1}{4}$ inch high engraved letters and shall contain the following information:
 - 1) Name
 - 2) Voltage
 - 3) Phase
 - 4) "3" or "4" wire, and
 - 5) Where it is fed from.
 - b. An example of a panelboard nameplate is:
Center Panel – 1HB
480/277 volt, 3 phase, 4 wire
Center Fed from DP2
 - c. An example of an automatic transfer switch nameplate is:
Center ATS #2
480/277 volt, 3 phase, 4 wire, 4 pole
Center Fed from MSB and DPE
 - 3. Each feeder device in a switchboard, distribution panel, and motor control center device shall have a nameplate showing the load served in $\frac{1}{2}$ inch high engraved letters.
 - 4. A black-white-black laminated plastic engraved identifying nameplate shall be secured by screws to each safety switch, disconnect switch, individual motor starter, enclosed circuit breaker, wireway, and terminal cabinet.
 - a. Identifying nameplates shall have $\frac{1}{4}$ inch high engraved letters and shall indicate the equipment served.
 - b. An example if a disconnect switch is: AHU-1.
 - 5. Cardholders and directory cards shall be furnished for circuit identification in panelboards. Cardholder shall be located on inside of panel door and shall be in a metal frame with clear plastic front. Circuit lists shall be typewritten. Circuit descriptions shall include location and name of each item of equipment served. Spares and spaces shall be written in erasable pencil for future use. Circuit directory shall show the room served by each circuit. The final graphs/signage room numbers shall be used. Do not use Architectural numbering on plans.
 - 6. Prohibited Markings: Markings which are intended to identify the manufacturer, vendor, or other source from which the material has been obtained are prohibited for installation within public, tenant, or common areas within the project. Also, prohibited are materials or devices which bear evidence that markings or

insignias have been removed. Certification, testing (example, Underwriters' Laboratories, Inc.), and approval labels are exceptions to this requirement.

7. Warning Signs: Provide warning signs where there is hazardous exposure associated with access to or operation of electrical facilities. Provide text of sufficient clarity and lettering of sufficient size to convey adequate information at each location; mount permanently in an appropriate and effective location. Comply with recognized industry standards for color and design.
8. Operational Tags: Where needed for proper and adequate information on operation and maintenance of electrical system, provide tags of plasticized card stock, either preprinted or hand printed. Tags shall convey the message, example: "DO NOT OPEN THIS SWITCH WHEN BURNER IS OPERATING."

PART 3 - EXECUTION

3.01 EXCAVATING AND BACKFILLING

- A. Trenching and backfilling and other earthwork operations required to install the facilities specified herein shall conform to the applicable requirements of Division 2 (95% of maximum standard density). Where trenching or excavation is required in improved areas, the backfill shall be compacted to a condition equal to that of adjacent undisturbed earth and the surface of the area restored to the condition existing prior to trenching or excavating operations. Provide a minimum of 3" of sand underneath all conduits. The plans indicate information pertaining to surface and sub-surface obstructions; however, this information is not guaranteed. Should obstructions be encountered whether or not shown, the Contractor shall alter routing of new work, reroute existing lines, remove obstructions where permitted, or otherwise perform whatever work is necessary to satisfy the purpose of new work and leave existing surfaces and structures in a satisfactory and serviceable condition. **All work shall comply with OSHA Standards.**

3.02 WORKMANSHIP AND CONCEALMENT

- A. The work of this Section shall be performed by workman skilled in their trade. Installation shall be consistent in completeness whether concealed or exposed. Each item of electrical work shall be concealed in walls, chases, under floors and above ceilings except:
 1. Where shown to be exposed.
 2. Where exposure is necessary to the proper function.

3.03 SLEEVES, CUTTING AND PATCHING

- A. This section shall be responsible for placing sleeves for all conduit passing through walls, partitions, sound walls, beams, floors, roof, etc. Sleeves through below-grade walls shall use water-tight fitting manufactured by O.Z. Gedey.
- B. All cutting and patching will be done under another Division, but this Section will be responsible for timely performance of this work and layout of holes and setting sleeves.
- C. All un-used sleeves shall be sealed with 2 hour UL approved fire sealant manufactured by "3M" or approved equal.
- D. Refer to 26 05 33 for additional requirements.

3.04 ELECTRICAL GEAR

- A. Install all electrical equipment in accordance with the National Electrical Code and as shown on the drawings.
- B. Lighting contractors, time clocks, disconnect switches, etc. mounted in mechanical/electrical rooms shall be mounted at a working height not requiring a ladder, when wall space is available. Installation of these devices at greater elevations shall be approved by the Engineer. Contractor shall provide a coordination sketch of each mechanical/electrical room noting locations and mounting heights of all electrical devices (note bottom and top elevations) shown to be installed. Sketches shall be provided to the Engineer for review and the general contractor for coordination with other trades working in these rooms.

3.05 CLEANING

- A. Clean lighting fixtures and equipment.
- B. Touch-up and refinish scratches and marred surfaces on panels, switches, starters, and transformers.

3.06 TESTS AND INSPECTIONS

- A. Tests and inspection requirements shall be coordinated with Division I.
- B. Date for final acceptance test shall be sufficiently in advance of completion date of contract to permit alterations or adjustments necessary to achieve proper functioning of equipment prior to contract completion date.
- C. Conduct re-tests as directed by Architect on portions of work or equipment altered or adjusted as determined to be necessary by final acceptance test. No resultant delay or consumption of time as a result of such necessary re-test beyond contract completion date shall relieve Contractor of his responsibility under contract.
- D. Put circuits and equipment into service under normal conditions, collectively and separately, as may be required to determine satisfactory operation. Demonstrate equipment to operate in accordance with requirements of these specifications. Perform tests in the presence of Architect. Furnish instruments and personnel required for tests.
- E. Final Inspection:
 - 1. At the time designated by the Architect, the entire system shall be inspected by the Architect and Engineer. The contractor or his representative shall be present at this inspection.
 - 2. Panelboards, switches, fixtures, etc., shall be cleaned and in operating condition.
 - 3. Certificates and documents required hereinbefore shall be in order and presented to the Architect prior to inspection.
 - 4. Panel covers, junction box covers, etc., shall be removed for visual inspection of the wire, bus bars, etc.
 - 5. After the inspection, any items which are noted as needing to be changed or corrected in order to comply with these specifications and the drawings shall be accomplished without delay.
- F. The contractor shall provide a thermographic test using an independent testing laboratory using an infrared scanning device. This test shall include but not limited to all switchboards, distribution panelboards, panelboards, automatic transfer switches and

other electrical distribution devices. This test shall be conducted to locate high temperature levels. This test shall be conducted between 3 to 8 months after occupancy, but not beyond the one year warranty period. Submit test to the architect and engineer using test reporting forms. All unacceptable conditions shall be corrected prior to the end of the warranty period.

END OF SECTION 26 02 00

SECTION 26 03 00 - DEMOLITION WORK

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The drawings do not show all demolition work required. The contractor shall make himself familiar with the required scope of work to accomplish the work required by these documents. All demolition work implied or required shall be included in the scope of this contract.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 DEMOLITION WORK

- A. The contractor shall be responsible for loss or damage to the existing facilities caused by him and his workmen, and shall be responsible for repairing such loss or damage. The contractor shall send proper notices, make necessary arrangements, and perform other services required for the care, protection and in-service maintenance of all electrical services for the new and existing facilities. The contractor shall erect temporary barricades, with necessary safety devices, as required to protect personnel from injury, removing all such temporary protection upon completion of the work.
- B. The contractor shall provide temporary or new services to all existing facilities as required to maintain their proper operation when normal services are disrupted as a result of the work being accomplished under this project.
- C. Where existing construction is removed to provide working and extension access to existing utilities, contractor shall remove doors, piping, conduit, outlet boxes, wiring, light fixtures, air conditioning ductwork and equipment, etc., to provide this access and shall reinstall same upon completion of work in the areas affected.
- D. Where partitions, walls, floors, or ceilings of existing construction are being removed, all contractors shall remove and reinstall in locations approved by the Architect all devices required for the operation of the various systems installed in the existing construction.
- E. Outages of services as required by the new installation will be permitted but only at a time approved by the Owner. The contractor shall allow the Owner 2 weeks in order to schedule required outages. The time allowed for outages will not be during normal working hours unless otherwise approved by the Owner. All costs of outages, including overtime charges, shall be included in the contract amount.
- F. The contractor shall modify, remove, and/or relocate all materials and items so indicated on the drawings or required by the installation of new facilities. All removals and/or dismantling shall be conducted in a manner as to produce maximum salvage. Salvage materials shall remain the property of the Owner, and shall be delivered to such destination as directed by the Owner. Materials and/or items scheduled for relocation and which are damaged during dismantling or reassembly operations shall be repaired and restored to good operative condition. The contractor may, at his discretion and upon the approval of the Owner, substitute new materials and/or items of like design and quality in lieu of materials and/or items to be relocated.

- G. All items which are to be relocated shall be carefully removed in reverse to original assembly or placement and protected until relocated. The contractor shall clean and repair and provide all new materials, fittings, and appurtenances required to complete the relocations and to restore to good operative order. All relocations shall be performed by workmen skilled in the work and in accordance with standard practice of the trades involved.
- H. When items scheduled for relocation are found to be in damaged condition before work has been started on dismantling, the contractor shall call the attention of the Owner to such items and receive further instructions before removal. Items damaged in repositioning operations are the contractor's responsibility and shall be repaired or replaced by the contractor as approved by the Owner, at no additional cost to the Owner.
- I. Service lines and wiring to items to be removed, salvaged, or relocated shall be removed to points indicated on the drawings, specified, or acceptable to the Owner. Service lines and wiring not scheduled for reuse shall be removed to the points at which reuse is to be continued or service is to remain. Such services shall be sealed, capped, or otherwise tied-off or disconnected in a safe manner acceptable to the Owner. All disconnections or connections into the existing facilities shall be done in such a manner as to result in minimum interruption of services to adjacent occupied areas. Services to existing areas or facilities which must remain in operation during the construction period shall not be interrupted without prior specific approval of the Owner as hereinbefore specified.
- J. During the construction and remodeling, portions of the project shall remain in service. Construction equipment, materials, tools, extension cords, etc., shall be arranged so as to present minimum hazard or interruption to the occupants of the building.
- K. Certain work during the demolition phase of construction may require overtime or nighttime shifts or temporary evacuation of the occupants. Coordinate and schedule all proposed down time with the Owner's Representative at least 72 hours in advance.
- L. Make every effort to minimize damage to the existing building and the Owner's property. Repair, patch, or replace as required any damage which might occur as a result of work at the site. Care shall be taken to minimize interference with the Owner's activities during construction. Cooperate with the Owner and other trades in scheduling and performance of the work.
- M. Include in the contract price all rerouting of existing conduits, wiring, outlet boxes, fixtures, etc., and the reconnecting of existing fixtures as necessitated by field conditions to allow the installation of the new systems. Furnish all temporary conduit, wiring, boxes, etc., as required to maintain lighting and power service for the existing areas with a minimum of interruption. Remove wire and conduit back to nearest accessible active junction box and extend to existing homeruns as required.
- N. All existing lighting fixtures, switches, outlets, speakers, materials, equipment and appurtenances not included in the remodel or alteration areas are to remain in place and shall remain in service.
- O. Electrical equipment, outlets, speakers, circuits to mechanical and building systems equipment, etc., which are to remain but which are served by conduit and/or circuiting that is disturbed by the remodeling work, shall be reconnected in such as manner as to leave it in proper operating condition.
- P. Existing branch circuit wiring which is to be removed, shall be pulled from the raceways

and the empty conduit shall be removed to a point of permanent concealment.

- Q. Existing lighting fixtures shown to be removed and indicated to be reused, shall be cleaned, repaired, relamped and provided with such new accessories as may be needed for the proper installation in their new locations.
- R. New circuiting indicated to be connected to existing panels shall be connected to "spares" and/or "released" breakers as applicable, or new breakers provided where space is available. Contractor shall verify the existing panel load and feeder capacity prior to adding any additional loads.
- S. Within the remodeled or alteration areas where existing ceilings are being removed and new ceiling are installed, all existing lighting fixtures, other ceiling mounted devices and their appurtenances shall be removed and reinstalled into the new ceiling, unless otherwise shown or specified.
- T. Within the remodeled or alteration areas where existing walls are being removed, all existing lighting fixtures, switches, receptacles, other materials and equipment and their appurtenances shall be removed, where required by the remodel work either shown or specified.
- U. Refer to Architectural "Demolition" and "Alteration" plans for actual location of walls, ceilings, etc. being removed and/or remodeled.

END OF SECTION

SECTION 26 05 19 - WIRE, CABLE AND RELATED MATERIALS

PART 1 - GENERAL

1.01 SCOPE

- A. Provide 600 volt building wire, cable and connectors and 300-volt wire, cable and connectors.
- B. WORK INCLUDED: Include the following Work in addition to items normally part of this Section.
 - 1. Wiring for lighting and power.
 - 2. Automatic Control Wiring.
 - 3. Connection of equipment shown.
- C. WORK SPECIFIED ELSEWHERE:
 - 1. Heating, ventilating, and air conditioning equipment.
 - 2. Structured cabling system.
 - 3. Coaxial cables

1.02 STANDARDS

- A. UL83
- B. ASTM B-3
- C. All wire cable and connectors shall be UL approved.

1.03 ACCEPTABLE MANUFACTURERS

- A. 600 VOLT WIRE AND CABLE
 - 1. Southwire
 - 2. Encore
 - 3. Cerro
 - 4. Tyco Thermal Controls
- B. 300 VOLT WIRE AND CABLE
 - 1. Westpenn
 - 2. Beldon
 - 3. Alpha
 - 4. Tappan - Southwire
- C. FLEXIBLE CABLE SYSTEMS
 - 1. AFC Modular Cable Systems
- D. CONNECTORS
 - 1. AMP - TYCO
 - 2. Burndy

3. Ideal
4. 3M
5. O.Z. Gedney
6. Thomas & Betts

1.04 SUBMITTALS

- A. Shop drawings shall include, but not limited to:
1. Cutsheets of wire, cable and connectors to indicate the performance, fabrication procedures, product variations, and accessories.

1.05 REQUIREMENTS OF REGULATORY AGENCIES WORK IN ACCORDANCE WITH:

- A. National Electrical Code.
- B. Local, municipal, or state codes that have jurisdiction.

PART 2 - PRODUCTS

2.01 WIRING

- A. All wire shall be new and continuous without weld, splice, or joints throughout its length. It must be uniform in cross-section, free from flaws, scales and other imperfections.
- B. WIRE MATERIAL: Soft drawn, annealed, 98% pure copper, with tin coating. Aluminum wiring is not acceptable.
- C. TYPES:
[SELECT "THHN/THWN" or XHHW"]
1. Provide type **["THHN/THWN"]** insulation for all buried feeders and service entrance conductors.
 2. Provide type "THHN/THWN" insulation for all branch circuits and above grade feeders.
 3. All wire No. 8 and larger shall be stranded. All wire No. 10 and smaller shall be stranded or solid.
 4. Provide type "XHHW" or other 90 degrees insulation wiring for branch circuit wiring installed through continuous rows of fluorescent fixture bodies.
 5. All 300-volt cable including but not limited to telephone, fire alarm, data, CATV and security shall be UL listed for use in return air plenums.
- D. CONDUCTOR SIZES
1. Feeder conductors shall be sized for a maximum of 2% drop in rated voltage at scheduled load.
 2. Branch circuit conductors shall be sized for a maximum 3% drop in the rated voltage to the longest outlet on the circuit.
 3. Minimum wire shall be No. 12, unless otherwise shown on Drawings or required by Code.
- E. COLOR CODING: No. 6 or larger shall use tape for color coding. No. 8 and smaller wire shall be color coded in accordance with the governing authority requirements or as follows:

120/208 VOLT
NEUTRAL: White
PHASE A: Black
PHASE B: Red
PHASE C: Blue
GROUND: Green

277/480 VOLT
Neutral: Gray
Phase A: Brown
Phase B: Purple
Phase C: Yellow
Ground: Green

120/240 VOLT
Neutral: White
Phase A: Black
Phase B: Orange
Phase C: Blue
Ground: Green

2.02 GROUNDING

Permanently connect all conduit work, motors, starters, and other electrical equipment to grounding system in accordance with the National Electrical Code.

2.03 METAL CLAD CABLE - TYPE MC

At the contractor's option, metal clad cable (MC) may be used if approved by the authority having jurisdiction. The cable shall contain an insulated green grounding conductor (3 wire) and shall be the same size as the phase conductor. Conductors shall be solid copper and the armor shall be flexible galvanized steel.

2.03 ARMORED CABLE - TYPE AC

At the contractor's option, armored cable (BX) may be used if approved by the authority having jurisdiction. The cable shall contain an insulated green grounding conductor (3 wire) and shall be the same size as the phase conductor. Conductors shall be solid copper.

PART 3 - EXECUTION

3.01 WIRE

- A. Do not pull wire into conduit until Work of an injurious nature is completed. Where two or more circuits run to a single outlet box, each circuit shall be properly tagged. Wyreze or approved equal may be used as a lubricant where necessary.
- B. Splices shall be fully made up in outlet boxes with compression crimp-on type splice connectors.
- C. Joints and splices will not be permitted in service entrance or in feeders. Joints in branch circuits will be permitted where branch circuits divide, and then shall consist of one through-circuit to which the branch shall be spliced. Joints shall not be left for the fixture hanger to make. Connect joints and splices with Buchanan Series "2000" solderless connectors complete with insulating caps or properly sized wire nuts.
- D. All stranded conductors shall be furnished with lugs or connectors.
- E. Connectors furnished with circuit breakers or switches shall be suitable for copper wire termination.
- F. "Sta-Cons" shall be used to terminate stranded conductors on all switches and receptacles.
- G. Metal Clad Cable - Type MC
 - 1. Metal clad cable shall not be used for homeruns. Metal clad cable shall only be used for branch circuit drops from ceiling mounted junction boxes to outlets and

for horizontal runs in a common wall from outlet to outlet. Do not route to outlets to adjacent walls. Metal clad cable may be looped from outlet to outlet in areas where non-accessible ceilings are used. Metal clad cable shall only be used in air-conditioned areas and shall not be run exposed.

2. Metal clad cable shall be UL approved connectors and shall be used and installed per Article 334 of the National Electrical Code. The cable shall be supported at intervals not exceeding 6 feet and within 12 inches of every box.
3. Provide anti-short bushing at cable ends.
4. Refer to electrical details for additional information and restrictions.
5. Metal clad cable shall not be installed in concrete.

G. Armored Cable - Type AC

1. Armored cable shall not be used for homeruns. Armored cable shall only be used for branch circuit drops from ceiling mounted junction boxes to outlets and for horizontal runs in a common wall from outlet to outlet. Do not route to outlets to adjacent walls. AC cable may be looped from outlet to outlet in areas where non-accessible ceilings are used.
2. Armored cable shall be UL approved connectors and shall be used and installed per Article 333 of the National Electrical Code. The cable shall be supported at intervals not exceeding 4-1/2 feet and within 12 inches of every box.

H. All stranded #10 and small conductors shall be terminated with an approved solderless terminal if the device or light fixture does not have provisions for clamp type securing of the conductor.

I. The jacket for all travelers used on 3-way and 4-way switches shall be pink.

3.02 BALANCING SYSTEM

The load on each distribution and lighting panel shall be balanced to within 10% by proper arrangement of branch circuits on the different phase legs. Provide written documentation showing results. Submit with O & M manuals.

3.03 LOW VOLTAGE WIRING

- A. Low voltage wiring shall be plenum rated. All wiring in mechanical rooms, electrical rooms, drywall ceiling, inaccessible areas, underground, plaster ceiling, inside concealed walls areas exposed to occupant view, and other areas subject to physical damage shall be run in conduit.
- B. Low voltage wiring shall be routed in separate raceways from power wiring systems.
- C. Sleeves shall be placed in the forms of concrete, masonry and fire rated walls, floor slabs and beams, for the passage of wiring. Sleeves should be set in place a sufficient time ahead of the concrete work so as not to delay the work. Sleeves shall be rigid galvanized steel.

3.04 CABLE SUPPORTS

- A. Provide cable supports in all vertical raceways in accordance with Article 300-19 of the NEC.

3.05 DEFECTS

- A. Defects shall include, but are not to limited to, the following:
1. Tripping circuit breakers under normal operation.
 2. Improperly connected equipment.
 3. Damaged, torn, or skinned insulation.

END OF SECTION

SECTION 26 05 26 - GROUNDING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

1.02 SCOPE

- A. **WORK COMBINED WITH OTHER SECTIONS:** Combine the work specified herein with the following Sections to form a single responsibility for the Work:
 - 1. Electrical.
 - 2. Basic materials and methods.
- B. Provide electrical service, equipment and wiring device grounding as shown, scheduled and as specified.
- C. The types of grounding include, but not limited to, the grounding bonding of all equipment devices, building steel piping, and as required by the National Electrical Code, Local Inspection Department and Power Company.

1.03 STANDARDS

- A. NATIONAL ELECTRICAL CODE (NFPA-70)
- B. Local municipal and State codes that have jurisdiction.
- C. NECA

1.04 ACCEPTABLE MANUFACTURES

- A. Provide grounding products manufactured by Copperweld and Cadweld.

1.05 SUBMITTALS

- A. Shop drawings shall include, but not limited to the following:
 - 1. Cut sheets of ground rods, clamps and connectors.
 - 2. Grounding system diagram.

PART 2 - PRODUCTS

- A. **GENERAL:** Provide all materials required to construct a complete grounded electrical system.
- B. **GROUND RODS:** Ground rods shall be 3/4" inch diameter by 10 feet long construction with copper jacket and a steel core.
- C. **CLAMPS:** Ground clamps shall be copper except for steel or iron pipes in which the clamps shall be galvanized iron.

- D. CONDUCTORS: Conductors shall be connected by means of an approved pressure connector or clamp.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. GENERAL: Install grounding system as shown and specified to ensure a properly grounded system.
- B. SERVICE ENTRANCE GROUNDING SYSTEM: Provide a main bonding jumper between the neutral and ground bus of each switchboard. Route a separate grounding electrode conductor in conduit from each **[main distribution panel]** to the ground rod grid, incoming cold water piping system, **[and to the "lightning protection system" (250 - 106 of NEC) under ground bonding loop]**. Provide a bonding jumper around water meter. The grounding electrode conductor shall be stranded copper, 98% conductivity and shall be run continuous without splices or joints and installed at least 12" below grade.
- C. BUILDING STEEL AND PIPING SYSTEM: Install a bonding jumper between building steel and metallic piping systems to bond them to the electrical grounding system.
- D. NEUTRAL: The neutral shall be grounded only at the service entrance and other separately derived systems. The neutral shall be kept separate from the grounding system and shall not be used as a ground.
- E. GROUNDING SEPARATELY DERIVED ALTERNATING CURRENT SYSTEM
1. TRANSFORMERS: The center point (neutral) of each wye connected transformer shall be bonded to the case and a grounding electrode conductor shall be connected to a ground rod or building steel.
 2. STANDBY EMERGENCY GENERATOR: The generator neutral shall be bonded to the generator when a 4 pole switched neutral automatic transfer switch is specified.
- F. GROUNDING CONDUCTOR: A grounding conductor and metallic conduit system shall bond all equipment served by the electrical system. Provide a flexible bonding jumper for isolated metallic piping and ductwork and around expansion fittings and joints.
- G. CONDUIT GROUNDING BUSHING:
- Conduit terminating in equipment that has a ground bus such as switchboards, panelboards, etc., shall have grounding bushings installed. Ground each conduit by means of a grounding bushing and to the ground bus in the equipment.
- H. MOTORS: The frame of all motors shall be grounded.
- I. SPECIAL GROUNDING: Provide a #6 AWG copper grounding conductor for each telephone board, television system, etc. Terminate the grounding conductor on ground bus and to the building electrical grounding system. Refer to 800-40(d) and 820-40(d) of the NEC.
- J. REMOTE PANELBOARDS: Provide a grounding electrode conductor all remote panels as required by the NEC and shown on drawings.

- K. LIGHTING FIXTURES: Flexible fixture whips containing a green grounding conductor shall be used to connect light fixtures. Flexible fixture whips shall not exceed ten feet.
 - L. RECEPTACLES: All receptacles shall be grounded using the branch circuit grounding conductor. Receptacles shall use an approved grounding yoke.
- 3.02 TESTING: Perform a ground resistance test using a biddle analog or digital portable earth/ground resistance tester. The system resistance shall not exceed 5 OHMS. Provide additional electrodes as required (refer to 250-84 of the NEC or the most current edition 250-56). Test shall not be conducted following wet weather. Provide personal instruments to conduct these tests and submit certified test for review. Test shall be verified by Engineer.

END OF SECTION

**SECTION 26 05 33
RACEWAYS**

PART 1 - GENERAL

1.01 SCOPE

- A. Provide electrical raceways and fittings as shown, scheduled and specified.
- B. The types of raceways and fittings required are as follows:
 - 1. Rigid hot-dipped galvanized steel conduit (RGS)
 - 2. Intermediate hot-dipped galvanized steel conduit (IMC)
 - 3. Electrical metallic tubing (EMT)
 - 4. PVC
 - 5. Flexible metal conduit
 - 6. Liquid-tight flexible metal conduit (non-metallic is not acceptable)
 - 7. PVC coated rigid galvanized steel conduit
 - 8. Aluminum Rigid Conduit (ARC)

1.02 STANDARDS

- A. ANSI, C80.1 & C80.3
- B. NEMA FB-1
- C. NEMA TC3
- D. UL, 6, 797 & 1242

1.03 ACCEPTABLE MANUFACTURERS

- A. Raceways
 - 1. Allied
 - 2. Triangle
 - 3. Republic
 - 3. Carlon
 - 4. Wheatland Tube
 - 5. Cantex
 - 6. Western Tube
 - 7. Robroy Industries
- B. Fittings
 - 1. Appleton
 - 2. Crouse Hinds
 - 3. Steel City
 - 4. O.Z. Gedney
 - 5. Carlon
 - 6. Raco, Inc.

1.04 SUBMITTALS

- A. Shop drawing shall include but not be limited to:

1. Cutsheets for raceways and fitting.

1.05 REQUIREMENTS OF REGULATORY AGENCIES WORK IN ACCORDANCE WITH:

- A. National Electrical Code.
- B. Local, municipal, or state codes that have jurisdiction.

PART 2 - PRODUCTS

2.01 PROVIDE CONDUIT AS FOLLOWS:

- A. Except as noted or otherwise specified, all wiring shall be installed in galvanized rigid steel, rigid aluminum conduit or electrical steel tube (EMT) of the proper size to contain the number of conductors required in accordance with the latest edition of the N.E.C. Where conduit sizes are shown on the drawings, these shall take preference. Contractor shall epoxy coat galvanized rigid steel conduit for use in natatoriums.
- B. EMT in sizes up to 4 inches when concealed or not exposed to damage and located indoors only.
- C. PVC coated rigid galvanized steel shall be used for all penetrations of slab on grade.
- D. Rigid galvanized steel where embedded in concrete or masonry construction, mechanical yard or in exterior/interior applications where subject to damage.
- E. Rigid aluminum shall be used in exterior applications. (i.e. roof, top of canopies)
- F. Carlon Schedule 40 PVC may be utilized underground, in or below slab where shown on the construction documents.
- G. MINIMUM SIZE: [3/4] inch. **[All homeruns shall be 3/4" minimum]. 1/2" conduit may be used for drops down walls to a single receptacle or switch.**
- H. PVC coated rigid galvanized steel conduit shall be coated inside and outside.
- I. PVC coated rigid galvanized steel conduit shall be used at cooling towers, corrosive areas and pool pump rooms.

J. Fixture whips: Refer to 26 51 00 for additional information.

J.K. Flexible metal shall be used for connecting rotating equipment installed in conditioned spaces.

K.L. Sealtite shall be used for connecting rotating equipment installed in non-conditioned spaces and outside.

L.M. Bear the stamped approval of the UL and be approved by the Architect and Engineer.

- 2.02 Branch circuits run underground shall be run in Carlon Schedule 40 PVC conduit. Install ground wire in accordance with NEC table 250-122.

2.03 FITTINGS

- A. Couplings for rigid steel or intermediate conduit shall be hot dipped galvanized steel. Set screw type is not acceptable.
- B. Steel or malleable iron fittings shall be used on all other raceway types except for PVC.
- C. **Couplings for aluminum raceways shall be threaded aluminum.**
- D. **EMT systems shall utilize steel insulated throat, set screw connectors and steel set screw couplings in all indoor conditioned spaces. EMT system shall utilize steel insulated throat, threadless, watertight compression type connectors and steel threadless watertight compression type coupling in all non-conditioned spaces.**
- D. Coupling and connectors accessories and fittings for PVC coated rigid galvanized steel shall be PVC coated.
- E. Metal sealite fittings shall be steel. Plastic is not acceptable.
- F. Provide nylon bushing on end of all low voltage cabling system conduits (sleeves, rough-ins, etc.).

PART 3 - EXECUTION

3.01 CONDUIT

A. GENERAL

The Drawings are diagrammatic, and are intended to show the general location of outlets, devices, fixtures, and arrangement and control of circuits. The Contractor shall determine exact locations by actual measurement of the building or by reference to the Architectural Drawings.

- B. Of such size, and so installed that conductors may be drawn in without injury or excessive strain.
- C. Where entering panels, pull boxes, junction boxes, or outlet boxes, shall be secured in place with lock nuts inside and outside, and insulated bushings inside.
- D. Have Red seal type VCC or approved equal cable supports in risers, as required by N.E.C.
- E. Have ends reamed after cutting and application of die.
- F. Keep conduit corked and dry during construction, and swab out before conductors are pulled.
- G. Have bends and offsets made with approved tools. Bends or offsets in which the pipe is crushed or deformed shall not be installed.
- H. Where not embedded in concrete or masonry, be firmly secured by approved clamps, half-straps or hangers.
- I. Have O.Z. Gedney or approved equal expansion fittings where crossing building expansion joints.

- J. EXPANSION JOINTS: Make provision for expansion and shifting of metal or PVC conduits where risers occur from underground.
- K. Except in the mechanical equipment rooms, run conduit concealed, and by the shortest practicable route between outlets. Install risers, drops, and offsets necessary to avoid conflict with ductwork, piping, structural members, and similar items.
- L. Install exposed conduit in mechanical rooms, and elsewhere as indicated, parallel to horizontal and vertical lines of walls, ceilings, and floors.
- M. In general, fluorescent fixtures in finished areas having suspended acoustical ceilings shall be connected to outlet boxes of lighting grid by flexible metal conduit; length not to exceed ten feet.
- N. Outlet boxes in partitions shall never be set back to back. They shall be offset to prevent undue noise transmission from room to room.
- O. Concealed conduit shall run in as direct manner as possible using long bends. Exposed conduit shall be run parallel with or at right angles to the lines of the building; and all bends shall be made with standard conduit elbows or conduit benders. Not more than equivalent of four quarter bends shall be used in any run between terminals and cabinet, of between outlet or junction boxes. Approved condulets shall be used in lieu of conduit elbows where ease of installation and appearance warrants their use and approved by the engineer. Conduit joints shall be made with approved couplings and unions.
- P. Conduits shall be continuous from outlet to outlet and from outlets to cabinets, junction or pull boxes and shall be electrically continuous throughout. Terminals of all conduits shall be provided with double lock nuts and bushing or terminated on conduit hubs. Use of running threads is prohibited.
- Q. Each entire conduit system shall be installed complete before any conductors are drawn in. Every run of conduit shall be finished before covering up to guard against obstructions and omissions.
- R. Sleeves shall be placed in the forms of concrete, masonry and fire rated walls, floor slabs and beams, for the passage of conduits. Sleeves should be set in place a sufficient time ahead of the concrete work so as not to delay the work. Sleeves shall be rigid galvanized steel and set to extend 4" above slab.
- S. All pipe penetrations through walls and concrete floors shall be fire rated by applying USG Thermafiber in the space between the concrete and the pipe. The fire rating shall be additionally sealed by using 3M brand model CP 25 or 303 fire barrier caulk and putty. All fire rating material shall be installed in accordance with manufacturer's printed instructions.
- T. All conduit shall be cleaned and swabbed to remove all foreign matter and moisture prior to pulling wire and cable. All boxes in which conduits terminate shall be cleaned of all concrete mortar and other foreign matter.
- U. Provide #30 nylon pulling line in all conduits in which permanent wiring is not installed.
- V. All conduit shall be securely fastened and supported using hot galvanized malleable iron one-hole pipe straps, clamps, hanger or other means approved by the engineer. Supports shall be as required by NEC Table 344-3 (B)(2). Tie wire shall not be used as support or securing means. Support conduit independently of ceiling hanger wire. Use all

thread rods to support outlet boxes, junction boxes and conduit.

- W. When PVC conduit is routed underground, all stub-up's and 90° elbows shall be PVC coated rigid galvanized steel. Use PVC coated rigid galvanized steel when penetrating concrete on grade.
- X. Route all conduit above grade unless otherwise noted on the construction documents.
- Y. Contact the Architect and Engineer for an installation review before covering any below grade or above grade conduit.
- Z. All new outlets shall be flush mounted. In remodeled areas where wall construction prohibits flush mounting, provide wiremold 2400 series. Verify exact location and routing with architect before installation.
- AA. Contractor shall not penetrate water proof barriers without using proper fitting to maintain barriers. This shall include exterior walls and slabs. Coordinate with Architect for proper methods.

3.02 FITTINGS

- A. Install approved expansion fitting in all conduit runs in excess of 150 feet or when crossing building expansion joints.

3.03 CONDUIT CORROSION PROTECTION

- A. Branch circuit conduits installed in concrete slabs on fill or grade shall be positioned in a manner to ensure complete concrete cover. In no case shall such conduits be exposed below or above the slab surfaces, or penetrate the waterproof membrane.
- B. At locations where metallic conduits pass through slabs on grade or transitions below grade, PVC coated rigid galvanized conduit shall be used.

3.04 OUTLET AND JUNCTION BOXES

- A. Provide an approved galvanized outlet box with adequate volume for number of conductors installed.
- B. Provide standard galvanized switch boxes of the required number of gangs. Switch boxes where conduit is exposed shall be handy boxes or approved equal.
- C. Outlet boxes for receptacles shall be similar to Universal 52151 with suitable raised cover. Receptacle boxes where conduit is exposed shall be handy boxes or approved equal.
- D. Weatherproof boxes shall be FS or FD. Provide these boxes in all non-conditioned areas, exterior areas and natatoriums.
- E. Outdoor boxes shall be NEMA 3R, with conduit connections made by Myers Hubs.
- F. See notes and details on Drawings for special box requirements.
- G. Provide junction boxes required to facilitate installation of the various conduit systems. Provide support boxes required for risers, each complete with approved cable supports as described elsewhere in this Division.

- H. Outlet boxes for drywall shall be standard galvanized 4" square boxes with the appropriate device cover.
- I. Provide floor outlet fittings for telephone to match fittings for duplex floor receptacles.
- J. Provide 3-1/2" deep gangable masonry boxes in all masonry wall (CMU). Steel City GW-135-G or approved equal.
- K. Provide shallow 4"x4" boxes in all demountable partitions.
- L. Metallic boxes located in fire rated walls or partitions shall be separated by a minimum horizontal distance of 24 in. This minimum separation distance between metallic boxes may be reduced when "Wall Opening Protective Materials" (CLIV) are installed according to the requirements of their Classification. Metallic boxes shall not be installed on opposite side of walls or partitions of staggered stud construction unless "Wall Opening Protective Materials" are installed with the metallic boxes in accordance with Classification requirements for the protective materials.
- M. Junction, pull boxes, condulets, gutters, disconnects, contactors, etc., above 2-foot x 2-foot grid ceilings shall be mounted within 18-inches of ceiling grid. Above 2-foot x 4-foot grid ceiling they shall be mounted within 30-inches of ceiling grid. All junction box, pull box, gutter openings shall be side or bottom accessible.

3.05 THRU-WALL SEALS

- A. Provide O.Z. Gedney "Thru-wall" seals for all conduits passing through concrete structure below grade, above grade, and floor penetrations below grade. These prevent moisture from entering the building.
- B. Straight sleeves are not acceptable.

3.06 PULL BOXES

- A. Pull boxes shall be provided for conduit systems as required and shall be constructed of galvanized steel of not less than gauge and size specified by National Electrical Code.
- B. Where two or more feeders pass through a common pull box, they shall be tagged to indicate clearly their electrical characteristics, circuit number, and panel designation.

3.07 WIREWAYS

- A. Wireways shall be installed as indicated or required and locations shall be coordinated with architect.
- B. Wireways shall be made of not less than 16-gauge sheet steel for 4 inch and 6 inch square sizes and 14 gauge steel for 8 inch and 12 inch square sizes. Couplings end plates, and knockouts shall be furnished as required. Each section of wireways shall be rigidly supported.
- C. Wiring in wireways shall be neatly bundled, tied and suitably tagged.
- D. The finish shall be ANSI-49 gray epoxy paint applied by a cathodic electrode position paint process over a corrosion resistant phosphate preparation for NEMA 1 wireways. Provide galvanized steel for NEMA 3R wireways. NEMA 3R wireways and auxiliary gutters are for horizontal mounting only.

3.08 UNDERGROUND DUCTBANK SYSTEM

A. DUCT SYSTEM

1. The duct system shall consist of Schedule 40 PVC or type 1-EB PVC conduits encased in **[red]** concrete as detailed on the drawings. Use rigid conduit for stub-ups and the last ten feet at the end of each ductbank. Duct lines shall be laid to a minimum grade of 4 inches per 100 feet and shall be free from either horizontal or vertical waves. Duct lines shall be straight unless otherwise noted on the drawings. Duct lines shall be installed so that the top of concrete in encased duct lines is not less than 24 inches below finished grade or finished paving at any point. Changes in direction or runs exceeding a total of 10 degrees, either vertical or horizontal, shall be accomplished by long sweep bends having a minimum radius of curvature of 25 feet. The long sweep bends may be made up of one or more curved or straight sections and/or combinations thereof using five degree angle couplings. Conduit shall be thoroughly cleaned before using or laying. During construction and after the duct line is completed, the ends of the conduit shall be plugged to prevent water washing mud into the conduits. Particular care shall be taken to keep the conduits clean of concrete, dirt, and any other substance during the course of construction.
2. Each single conduit of the duct bank shall be completely encased in steel reinforced concrete as indicated. The thickness of concrete encasement indicated is the minimum thickness, and may be increased to fit the actual shape of trench.
3. Concrete for duct bank envelopes shall be standard 2000 psi concrete mix as described in Division 03, **[and be colored deep red for permanent marking of underground electrical work. The concrete red pigment shall be pure inorganic natural metallic base pigment, approved by the Engineer before use. Organic pigments will not be permitted. The approved pigments shall be mixed four pounds per yard of cement]**.
 - a. Envelopes may be poured directly against sides of trenches if the "cut" is clean, even and free of loose material. All loose dirt and extraneous material shall be removed from the trenches before and during the pouring of concrete to ensure sound envelopes. Concrete shall be carefully spaded during pouring to eliminate all voids under and between the conduit and honeycombing of the exterior surfaces. Power driven tampers or agitators shall not be used, unless specifically designed for the application, in order to ensure that the water-tightness of the conduits is not destroyed.
 - b. Generally, each run of envelopes shall be poured in one continuous operation. Where more than one pour is necessary, each pour shall terminate in a vertical plane. Partial pours shall not terminate in horizontal or angular planes.

- B. For normal underground installation see Section 26 02 00 -3.01 for Excavating and Backfilling.

END OF SECTION

SECTION 26 27 26 - WIRING DEVICES

PART 1 - GENERAL

1.01 SCOPE

- A. Provide wiring devices as shown; scheduled, required and as specified.
- B. The types of wiring devices required include:
 - 1. Receptacles
 - 2. Switches
 - 3. Coverplates

1.02 STANDARDS

- A. NEMA WD-1
- B. NEMA WD-5
- C. UL
- D. Federal Spec WC-596-F and WS-896

1.03 ACCEPTABLE MANUFACTURERS

- A. Leviton Manufacturing
- B. Hubbell
- C. Pass & Seymour

1.04 SUBMITTALS

- A. Shop drawings shall include but not limited to:
 - 1. Cut sheets of all devices indicating NEMA configuration, rating, materials, color, and all accessories.
 - 2. Cut sheets of all coverplates indicating materials, color and any engraving specified on drawing or in the specifications.

1.05 REQUIREMENTS OF REGULATORY AGENCIES WORK IN ACCORDANCE WITH:

- A. National Electrical Code.
- B. Local, municipal, or state codes that have jurisdiction.

PART 2 - PRODUCTS

2.01 MATERIALS AND COMPONENTS

- A. GENERAL
 - 1. Provide factory assemble wiring devices with the rating type and color as required

- and specified for the service indicated.
- 2. Provide matching one-piece multiple gang plates where switches are ganged. Provide wall plates for each receptacle furnished.
- 3. Architect reserves the right to select wiring device styles and colors to match wall finish.
- 4. Wall plates shall be of same manufacturer as devices.

2.02 SWITCHES

- A. Provide specification grade **[Gray]** toggle switches where indicated on the Drawings. Provide "Red" switches for switching emergency lighting circuits where switching is indicated. Coordinate exact locations with architect.
- B. Wall switches shall be 20 amp, 120-277 volt and shall be Leviton, Hubbell or P&S as follows:
 - 1. SINGLE POLE SWITCHES:
Leviton 1221-2, Hubbell HBL 1221, P&S PS20AC1
 - 2. DOUBLE POLE SWITCHES:
Leviton 1222-2, Hubbell HBL 1222, P&S PS20AC2
 - 3. THREE WAY SWITCHES:
Leviton 1223-2, Hubbell HBL 1223, P&S PS20AC3
 - 4. FOUR WAY SWITCHES:
Leviton 1224-2, Hubbell HBL 1224, P&S PS20AC4
 - 5. MOMENTARY CONTACT SWITCHES:
Leviton 1257, Hubbell HBL 1557, P&S 1251
 - 6. THREE POSITION, TWO CIRCUIT MAINTAINED CONTACT SWITCHES:
Leviton 1285, Hubbell HBL 1385, P&S 1225
 - 7. KEY TYPE LOCKABLE CORBIN STYLE:
Leviton 1221-2KL with 2KL key or P&S PS20AC1-KL with 4609 key for each switch, Hubbell #HBL 1221-RKL.
- C. Dimmers: Provide Lutron Nova "T" series or Leviton or as shown on drawings. Wall box dimmers shall be sized to handle the load. Where fluorescent dimming ballasts are to be used, coordinate wall box dimmer with ballast manufacturer.
- D. Light Handle Switches: Provide Leviton 1221-7L-LHC, Hubbell HBL1221-IL, P&S PS20AC1-ISL lighted handles to switch emergency lights were noted on the drawings.

OR

- A. Provide specification grade **[Gray]** Decora style rocker switches where indicated on the Drawings. Provide "Red" switches for switching emergency lighting circuits where switching is indicated. Coordinate exact locations with architect.
- B. Wall switches shall be 20-amp, 120-277 volt and shall be Leviton, Decora, Pass & Seymour Decorator, or Hubbell Style line Series 21 as follows:
 - 1. SINGLE POLE SWITCHES: Leviton 5621-2, P&S 2621, Hubbell 2121
 - 2. DOUBLE POLE SWITCHES: Leviton 5622-2, P&S 2622, Hubbell 2122
 - 3. THREE WAY SWITCHES: Leviton 5623-2, P&S 2623, Hubbell 2123
 - 4. FOUR WAY SWITCHES: Leviton, 5624-2, P&S 2624, Hubbell 2123
 - 5. MOMENTARY CONTACT SWITCHES:

6. Leviton, 1257, Hubbell HBL 1557, P&S 1251
THREE POSITION, TWO CIRCUIT MAINTAINED CONTACT SWITCHES:
Leviton 1285, Hubbell HBL 1385, P&S 1225

- C. Dimmers: Provide Lutron Nova "T" series or Leviton wall box dimmers sized to handle the load. Where fluorescent dimming ballasts are to be used, coordinate wall box dimmer with ballast manufacturer.
- D. Light Handle Switches: Provide Leviton 5649-2 or P&S 2625 lighted handles to switch emergency lights where noted on the drawings.

2.03 RECEPTACLES

[SELECT CONVENTIONAL OR DECORATOR TYPE RECEPTACLES AND COLOR]

- A. Provide specification grade **[Gray]** receptacles where indicated on the Drawings. Provide "Red" receptacles for receptacles on emergency power. Coordinate exact location with architect.
- B. Receptacles shall be Leviton, Hubbell or Pass & Seymour as follows:
1. Duplex 20A-125V-self grounding: (Nema configuration 5-20R):
Leviton 5362, Hubbell HBL5362, P&S 5362A
 2. Simplex 20A-125V-Self Grounding: (Nema configuration 5-20R):
Leviton 5361, Hubbell HBL5361, P&S 5361
 3. Isolated ground duplex, 20A-125V: (Orange, Nema configuration 5-20R)
Leviton 5362IG, Hubbell IG5362, P&S IG6300.
 4. Clock hanger receptacle 15A-125V: (Brown with stainless steel plate with hanger, Nema configuration 5-15R).
Leviton 5361-CH, Hubbell 5235, P&S S3733-SS
 5. Ground fault circuit interrupter (GFCI) receptacle 20A-125V; (Nema Configuration 5-20R, shall incorporate features which will lock-out or render the device incapable of being reset if ground fault protection is compromised, with "Feed through" connectors capable of protecting connected downstream receptacles on a single circuit, and of being installed in a 2-3/4" deep outlet box without adapter, Leviton 8899, P & S 2094.
 6. Tamper resistant receptacles 20A-125V (Nema configuration 5-20R):
Leviton 8300-SG, Hubbell HBL8300SG, P&S TR63-H.
 7. Surge Protection Duplex Receptacles 20A-125V, (Nema 5-20R) Hospital grade to include LED light and audible alarm:
Leviton 8380, Hubbell HBL 8362SA, P&S 8300SP
 8. Equipment receptacles shall be coordinated with owner/manufacture requirements and the correct and appropriate receptacle and coverplate shall be installed.

OR

- A. Provide specification grade, Decora type **[Gray]** receptacles where indicated on the Drawings. Provide "Red" receptacles for receptacles on emergency power. Coordinate exact location with architect.
- B. Receptacles shall be Leviton, Decora, Hubbell Style Line Series 21 or Pass & Seymour Decorator as follows:

1. Duplex 20A-125V-self grounding: (Nema configuration 5-20R):
Leviton 16362, P&S 2091 Hubbell 2162.
2. Simplex 20A-125V-Self Grounding: (Nema configuration 5-20R):
Leviton 16351, P&S 26361, or Hubbell 2161.
3. Isolated ground duplex, 20A-125V: (Orange, Nema configuration 5-20R)
Leviton 16362-IG, P&S IG8300XSP (where X denotes color) or Hubbell IG2162.
4. Clock hanger receptacle 20A-125V: (Brown with stain finish stainless steel plate with hanger, Nema configuration 5-20R).
Leviton 5361-CH, Hubbell 5235, P&S S3733-SS
5. Ground fault circuit interrupter (GFCI) receptacle 20A-125V; GF-5352. (Nema Configuration 5-20R, shall incorporate features which will lock-out or render the device incapable of being reset if ground fault protection is compromised, with "Feed through" connectors capable of protecting connected downstream receptacles on a single circuit, and of being installed in a 2-3/4" deep outlet box without adapter Leviton 8899 or P&S 2094.
6. Tamper resistant receptacles 15A-125V: (Nema configuration 5-20R):
Leviton 16262-SG
7. Surge Protection Duplex Receptacles 20A-125V, (Nema 5-20R) Hospital grade to include LED light and audible alarm:
Leviton 8380, Hubbell HBL 8362SA, P&S 8300SP
8. Special equipment receptacles shall be coordinated with owner/manufacture requirements and the correct and appropriate receptacle and coverplate shall be installed.

2.04 Floor boxes shall be cast iron as manufactured by Hubbell or equal by Wiremold and as indicated below:

- A. Slab at grade (dual level, fully adjustable type 1).
 1. Single gang: #B-2436 w/#SB-3083 carpet flange.
 2. Two gang: #B-4233 w/#SB-3084 carpet flange.
 3. Three gang: #B-4333 w/#SB-3085 carpet flange.
- B. Slab above grade (shallow, semi-adjustable, type II)
 1. Single gang: #B-2414 w/#SB-3083 carpet flange.
 2. Two gang: #B-4214 w/#SB-3084 carpet flange.
 3. Three gang: #B-4314 w/#SB-3085 carpet flange.
- C. Cover plates shall have brass finish as follows:
 1. #S-3825 for duplex flap for duplex receptacles.
 2. #S-2425 for data/communications.

2.05 PVC floor boxes manufactured by Wiremold shall be as follows:

- A. Provide #881 dual service PVC floor box with divider and 897CTC cover.

2.06 PLATES

- A. Furnish and install plates on all outlet boxes. Oversize (Jumbo) plates are not acceptable.
- B. **[Plates shall be 304 smooth stainless steel.]**

- C. Provide Taymac Bell, Carlon or Leviton NEMA 3R weatherproof coverplates on all exterior wiring devices. Enclosure shall be suitable for wet locations when in use.
- D. Plates shall be Leviton, Pass & Seymour or Hubbell 302/304 smooth stainless steel on all receptacles 30 amps and larger.

2.07 Fire rated poke through devices shall be as follows:

- A. Flush fire rated poke through devices shall be Wiremold RC2001 Series (black) with pre-wired 20A, 125V duplex receptacle and (4) individual openings for telephone, signal or Category 5 data cables.
- B. Poke through devices with above floor service fittings shall be Wiremold RC700 Series with (1) 20A, 125V duplex receptacle and telephone data cover plate.

PART 3 - EXECUTION

3.01 WIRING DEVICE MOUNTING HEIGHTS

- A. Unless noted to the contrary on plans, or directed otherwise during the progress of the Work, wiring devices shall be set as follows:
 - 1. Switches 42" above finished floor.
 - 2. Wall mounted receptacles shall be installed vertically at 15 inches to the bottom outlet above finished floor unless otherwise noted or as required by local codes.
 - 3. Wall telephone outlets shall be mounted 15 inches to the bottom above finished floor unless otherwise noted. Mount even with wall mounted receptacles.
 - 4. At locations above counters, set devices at 6 inches above to the centerline counter tops, verify exact mounting height with the architect.

3.02 INSTALLATION (Refer to 26 05 33 for outlet box specifications.)

- A. Wall switches shall be set in a suitable steel box and shall be installed on the strike side of the door as finally hung, whether so indicated on the Drawings or not.
- B. Receptacles shall be installed in a suitable steel box.
- C. The Architect reserves the right to relocate wiring device up to a distance of 5 feet from the location shown, before rough-in, without additional cost.
- D. Provide multi-gang device covers at locations where devices gang together.
- E. Device locations are indicated schematically on the drawings along with the type and mounting height. Final locations and mounting heights shall be coordinated with the Architect on the jobsite, and with shop drawings of equipment; including equipment to be furnished and installed by the Owner. Devices installed in walls covered with vinyl, fabric wallpaper or other special finishes shall be coordinated and verified with the Architect on the job-site.
- F. Stranded wire termination to switches, receptacles, devices and miscellaneous control devices shall be with an approved solderless terminal if clamp type securing is not possible (i.e. Sta-Con crimp on fork tongue connectors; Burndy Type TP-F).

- G. Provide keyed switches in all common areas not monitored by the faculty (i.e. gym, corridors, cafeteria, commons natatoriums).

END OF SECTION

SECTION 26 28 16 - SAFETY AND DISCONNECT SWITCHES

PART 1 - GENERAL

1.01 SCOPE

- A. Provide safety and disconnect switches as shown, scheduled and as specified herein.

1.02 STANDARDS

- A. Products shall be designed, manufactured, tested and installed in compliance with applicable standards.
 - 1. NEMA KS1 - Enclosed switches
 - 2. Federal specification W-S-865C-Heavy duty switches
- B. Products shall conform all applicable UL standards, including UL98 (standard for safety, enclosed and dead front switches) and shall be UL-labeled.

1.03 ACCEPTABLE MANUFACTURERS

- A. Provide one of the following manufacturers:
 - 1. General Electric Company
 - 2. Square D Company
 - 3. Siemens
 - 4. Eaton

1.04 SUBMITTALS

- A. Shop drawings shall include, but not be limited to:
 - 1. Cutsheets of switches with ratings, physical dimensions and all accessories clearly labeled.

1.05 REQUIREMENTS OF REGULATORY AGENCIES

- A. WORK IN ACCORDANCE WITH:
 - 1. National Electrical Code.
 - 2. Local, municipal, or state codes that have jurisdiction.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Furnish and install heavy duty type safety switches with the number of switched poles as indicated on the plans and specifications. All safety switches shall be NEMA Heavy Duty Type HD, and Underwriters Laboratories listed.

2.02 MATERIALS AND COMPONENTS

- A. Switch Interior

All switches shall have switch blades that are fully visible in the "OFF" position when the door is open. Switches shall have removable arc suppressor where necessary, to permit easy access to line side lugs. Lugs shall be front removable and UL listed for 60°C and 75°C copper or aluminum cables. All switches blades and contacts shall be plated copper. Adjust fuse block to accept Class J fuses.

B. Switch Mechanism

Switches shall have a quick-make and quick-break operating handle and mechanism, which shall be an integral part of the box, not the cover. Padlocking provisions shall be provided for locking in the "OFF" position with at least three padlocks. Switches shall have a dual cover interlock to prevent unauthorized opening of the switch door when the handle is in the "ON" position, and to prevent closing of the switch mechanism with the door open. A means shall be provided to permit authorized personnel to release the interlock for inspection purposes. Handle position shall indicate if switch is "ON" or "OFF".

C. Neutral

Provide a solid neutral with the safety switch where a neutral is present in the circuit.

D. Ratings

Switches shall be horsepower rated for ac and/or dc as indicated by the plans. The fused switches shall have Class R rejection fuse clips or adjusted for Class J fuses. UL listed short circuit ratings of the switches, when equipped with Class R fuses, shall be 200,000 symmetrical amperes.

E. Enclosures

1. Indoor switches shall be furnished in NEMA 1 enclosures.
2. Outdoor switches, switches located in wet areas or sprinkled areas shall be furnished in NEMA 3R enclosures.
3. Switches installed in wet areas such as cooling tower areas shall be NEMA 4X stainless steel or fiberglass reinforced polyester.
4. Switches installed in kitchens shall be stainless steel.
5. Switches installed in areas of a corrosive nature and subjected to salt air shall be NEMA 4X stainless steel or fiberglass reinforced polyester.

F. Service Entrance

Switch shall be suitable for use as service entrance equipment when installed in accordance with the National Electrical Code.

PART 3 - EXECUTION

3.01 GENERAL

- A. Install safety and disconnect switches, including electrical connections, and fuses in accordance with manufacturer's written instructions, NEC and recognized industry practices.
- B. Location: Install switches within sight of controllers.
- C. Hubs: Provide bolt-on hubs for rainproof or wet area applications.

3.02 IDENTIFICATION

- A. Nameplate: Each disconnect switch shall have an engraved bakelite nameplate. Nameplates shall be white with black letters and show equipment served. Nameplates shall be attached with stainless steel screws.

END OF SECTION

SECTION 26 51 00 - LIGHTING FIXTURES

PART 1 - GENERAL

1.01 SCOPE

- A. Furnish and install general and emergency lighting fixtures as noted on the drawings. Fixtures shall be completely wired with lamps installed and shall be in perfect operating condition at the time of substantial completion.
- B. The types of lighting fixtures required for this project include:
 - 1. LED

1.02 STANDARDS

- A. All fixtures shall conform to all applicable UL standards and shall be UL label including damp and wet location ratings.
- B. All fluorescent ballast shall comply with certified ballast manufacture (CBM) standard and CBM labeled.
- C. NFPA 101
- D. ANSI C82.1
- E. NEMA-LE
- F. IEEE Publication 587 Category "A" (Electronic Ballast)

1.03 ACCEPTABLE MANUFACTURERS

- A. Provide lighting fixtures produced by manufacturers as shown and scheduled.
- B. BALLAST:
 - 1. Provide one of the following manufacturers
 - a. Advance Transformer Company
 - b. Universal Lighting Technologies
 - c. Osram Sylvania
- C. LAMPS:
 - 1. Provide one of the following manufacturers
 - a. Phillips
 - b. Acuity
 - c. Visionaire

1.04 SUBMITTALS

- A. Shop drawings shall include a brochure with a separate cut sheet for each fixture type arranged in alphabetical order with fixture and all accessories/options clearly labeled. Provide performance data for each fixture. Provide an independent test lab report for each fixture if requested by the Architect/Engineer.
- B. Provide ballast and lamp data brochures indicating which lamp and ballast (if required) will be used in each fixture type.

- C. Furnish air handling and heat removal data for light fixtures specified with these requirements.

1.05 REQUIREMENTS OF REGULATORY AGENCIES

- A. WORK IN ACCORDANCE WITH:
 - 1. National Electrical Code.
 - 2. Local, municipal, or state codes that have jurisdiction.
 - 3. UL fire resistance directory.

PART 2 - PRODUCTS

2.01 MATERIALS AND COMPONENTS

2.1 GENERAL

- A. Descriptions, type letters, manufacturers' names and general characteristics are shown on the drawings. Manufacturers' names noted are for defining quality of construction only and do not limit other manufacturers' products.
- B. Metal Parts of Fluorescent Fixtures: Reflectors shall be as indicated on schedule. Channels shall be steel with a baked enamel finish.
- C. Metal Parts of Exterior Fixtures: Corrosion resisting metal, (non-ferrous or stainless steel) and in all cases suitable for outdoor service without tarnishing or other damage due to exposure; manufacturer's standard colors, unless specified otherwise; cadmium plate all metal parts concealed by canopies, including screws, plates and brackets.
- D. Special Adapters, Plates, Brackets, and Anchors: Provide where required by construction features of the building to suitably mount lighting fixtures; all such appurtenances and mounting methods approved by the University prior to fabrication and installation.
- E. Lighting fixtures replacement shall not require removal or alteration to a permanent section of the structure i.e. permanent ceiling. Fixtures shall be easily replaceable otherwise a different type of fixture should be provided.

2.2 LAMPS

- A. Provide Sylvania, General Electric, Westinghouse, or equal lamps of size and types as indicated on the drawings. Lamps shall be operating before final review of the work is requested. Fluorescent lamps shall be tri-stimulus 3500°K color.
- B. LED lamp-life hour is approximately 50,000 hours.

2.3 LED DRIVER

- A. LED driver shall be installed in an electrical enclosure.
- B. Wiring inside enclosure shall comply 600V/105 degrees rating or higher.
- C. LED driver shall comply with UL standard UL1012.
- D. LED driver shall have Class A sound rating.
- E. LED driver shall be UL certified for use in a dry or damp location.
- F. LED driver shall tolerate sustained open circuit and short circuit output conditions without damage.
- G. LED driver shall comply with the requirements of the FCC rules and regulations, Title 47 CFR Part 15 Non-Consumer (Class A).

2.4 LIGHT EMITTING DIODE (LED) FIXTURES

- A. Luminaires shall be controlled by photocells or automatic profile dimming & motion response override as required by the design.
- B. Outdoor luminaires shall have provisions for house side shield to prevent glare to uphill neighbors.
- C. Luminaire shall have door frame and lens with LED arrays and integral airflow ventilation

- system.
- D. The light distribution pattern of the luminaires shall be suitable for a S/H ratio of approximately 1.8.
 - E. Pole mounted lights shall have in line/in pole fusing.
 - F. The lighting system shall consist of the type and manufacturer as shown on the drawings or approved equal. If other than fixture shown is submitted complete illumination calculations are required to show equality.

2.02 SPARE LAMPS

- A. Provide 5% spare lamps, minimum of 3 of each type.
- B. Ship lamps to the Owner in original cartons (loose lamps are not acceptable).

PART 3 - EXECUTION

3.01 INSTALLATIONS

- A. General
 - 1. Install the type of light fixture where shown and indicated in accordance with manufacturer's written instructions.
 - 2. Provide earthquake clips on all recessed lay-in light fixtures as required by building code.
 - 3. Adjust all adjustable light fixtures, as directed by the Architect.
 - 4. Provide safety chains and wire guards for light fixtures located in gymnasium, multi-purpose rooms, play areas, etc.
- B. Coordination
 - 1. The contractor shall verify the type of fixtures with the ceiling types as indicated on the drawings. Any discrepancies shall immediately be brought to the architect's attention before the contractor places his order and accepts delivery. Fixtures shall fit exact in the type of ceiling scheduled. Provide plaster frames, trim rings and other accessories required for a correct fit.
 - 2. Provide supports attached to structural member to support fixtures when the ceiling system cannot maintain support. Provide separate supports for all recessed ceiling mounted HID fixtures.
 - 3. Refer to architectural reflected ceiling plan for the exact location of all light fixtures. Notify the architect for any discrepancies or conflicts with structural, architectural, mechanical piping or ductwork before installation.
- C. Mounting
 - 1. Provide support channels to support outlet boxes used support surface mounted light fixtures such as exit signs or downlights.
 - 2. Pendant or surface mounted fixture shall be provided with required mounting devices and accessories, including hickey and stud-extensions, ball-aligners, canopies and stems. Locations of fixtures in mechanical areas shall be coordinated with mechanical contractor. Mounting stems of pendant fixtures shall be of the correct length to uniformly maintain the fixture heights shown on the drawings or established in the field. The allowable variation tolerance in mounting individual fixtures shall not exceed 1/4 inch and shall not vary more than 1/2 inch from the floor mounting height shown on the Drawings. Fixtures hung in continuous runs shall be installed absolutely level and in line with each other. Hanging devices shall comply with Code requirements. Fixtures shall employ single - not twin - stem hangers unless otherwise noted.

3. All structure mounted fixtures (i.e. bracket mounted, pipe mounted and surface mounted) shall be provided with cables of suitable size and weight to support the weight of the fixture. Cables shall be fastened around or fastened to the housing of the fixture. On pendant fixtures, one safety cable of suitable size and weight to support the weight of the fixture assembly shall connect the top of the pendant to the supporting structure by means of welding or bolting, and one safety cable shall connect the housing of the fixture to the bottom of the pendant. Where more than one pendant per fixture occurs, only one pendant must be cabled. Track fixtures for pendant mounted track shall also be supplied with clip-on safety cables of suitable size and weight to support the weight of the fixture.

D. Electrical Connection

1. All light fixtures installed in an accessible suspended ceiling shall be connected from a branch circuit junction box using 1/2" flexible metal conduit or MC cable fixture pigtails not exceeding 8'- 0". All fixtures must be grounded by using a grounding conductor. Fixture to fixture wiring of fixtures installed in an accessible ceiling is not permitted. Fixture whips shall not lay-on ceiling tile or grid. Provide caddy clips to provide additional support.

3.02 FINAL INSPECTION

- A. Remove all plastic and protective coating from all fixtures. Fixtures shall be thoroughly cleaned. Replace any damaged fixture or fixture parts including reflectors, louvers, lens and metal parts that show signs of corrosion.
- B. All final incandescent lamps used during construction shall be replaced with new lamps. Replace all other defective ballast, lamps or discolored lamps, showing signs of excessive usage.
- C. Demonstrate proper operation of all fixtures and controls.

END OF SECTION

PUMPS & CONTROLS AND PACKAGE SYSTEMS

Part I – GENERAL

1.1 WORK INCLUDED

A. Contractor shall furnish and install end suction frame mounted pump complete with pump, motor, base frame, coupling and coupling guard in accordance with manufacturer's recommendations and plans.

ACCEPTABLE MANUFACTURERS

- A. Provide pumps produced by manufacturers equal to those shown on schedule.
- B. PUMPS:
 - 1. Acceptable manufacturers
 - a. Grundfos
 - b. Paco
 - c. Armstrong
 - d. Approved equal

1.2 REFERENCE STANDARDS

The work in this section is subject to the requirements of applicable portions of the following standards:

- A. HI – Hydraulic Institute
- B. ANSI – American National Standards Institute
- C. ASTM – American Society for Testing and Materials
- D. IEEE – Institute of Electrical and Electronics Engineers
- E. NEMA – National Electrical Manufacturers Association
- F. NEC – National Electrical Code
- G. ISO – International Standards Organization
- H. UL – Underwriters Laboratories, Inc.
- I. CSA –Canadian Standards Association
- J. OSHA – Occupational Safety & Health Administration
- K. ASME – American Society of Mechanical Engineers
- L. IEC– International Electrotechnical Commission
- M. ETL – Electrical Testing Laboratories
- N. NSF – National Sanitation Foundation

Part 2 – PRODUCTS

2.1 Frame Mounted End Suction Pumps

- A. Furnish and install frame mounted end suction pumps as per plans and pump schedule.
- B. The pump, electric motor, base frame, coupling and coupling guard shall be factory assembled at the pump manufacturer's facility. The pump manufacturer shall have complete unit responsibility.

2.1.1 PUMPS

- A. The pumps shall be flexible coupled, base mounted, single stage, end suction top discharge design, cast iron stainless steel fitted construction specifically designed for high performance.
- B. The pumps shall have the following features:
 - 1. All pumps shall be of the back pull-out design so that the rotating element can be removed from the casing without disconnecting the suction or discharge piping. The casing material shall be close-grained cast iron ASTM A48 - Class 30 with a minimum tensile strength of 30,000 P.S.I. Volute shall have integrally cast suction and discharge connections, gauge ports at nozzles, and vent and drain ports. Pumps with specific speed greater than 1600 shall have double volute casing. Pumps with discharge size 3" and larger shall have suction splitter to reduce pre-rotation and improve efficiency. Casings shall be designed for scheduled working pressure and can withstand hydrostatic test at 150% of the maximum working pressure under which the pump could operate at design speed.
 - 2. Pumps with impeller diameter larger than 5" shall be fitted with bronze renewable case wear rings.
 - 3. Pumps with discharge size 2.5" and larger shall have full flanged connections on both suction and discharge. Suction and discharge flanges shall be drilled to ANSI Class 125# standards and be machined flat face.
 - 4. Pumps with discharge sizes 2" and below shall have NPT threaded connection.
 - 5. Pump shall be mounted on a heavy-duty cast-in-one-piece cast iron bearing frame with integrally cast feet to mount on a common base frame.
 - 6. The bearing frame shall be of the back pull-out design and supply support for heavy-duty single row, double shield, deep groove greased for life ball bearings. The pump shaft shall be adequately supported by the pump bearings to limit the shaft deflection to 0.002 inches. Bearing shall provide a minimum L10 life of 20,000 hours.
 - 7. The pump shaft shall be of solid, stress-proof steel AISI 1144 with Bronze sleeves covering the wetted area of the shaft.

8. The pump manufacturer shall recommend the proper mechanical seal based on the pressure, temperature and liquid outlined on the equipment schedule. Mechanical seals, at a minimum, shall have ceramic stationary seats, carbon rotating rings, Buna elastomers and stainless steel hardware. Application of a mechanical seal shall be internally flushed type, without requiring external flushing lines. Seals shall be capable of being inspected and easily replaced without removing the piping or volute.
9. Impeller shall be of the enclosed francis vane type, single suction design, made of Stainless Steel 304 (UNS S30400), both hydraulically and dynamically balanced to ISO 1940-1:2003 balance grade G6.3 and keyed to the shaft. The impeller shall be trimmed to meet the specific hydraulic requirements.
10. Pump Construction. The standard material of construction for the pump shall be as below.

Special material shall be available as option to suit the liquid pumped.

- Volute: Cast iron ASTM A48 - Class 30
- Case Wear ring: Tin Bronze ASTM B584-90500
- Impeller: Stainless Steel 304 (UNS S30400)
- Shaft: Stressproof Steel AISI 1144
- Shaft Sleeve: Bronze III932 C89835
- Mechanical Seals: Carbon – Ceramic with Buna Elastomers and Stainless Steel hardware
- Bearings: Greased for life Heavy duty Single row Ball bearing
- Bearing Frame: Cast iron ASTM A48 - Class 30

C. A flexible coupling shall be employed between the pump and motor. A coupling capable of absorbing torsional vibration and of operating in variable speed applications shall be provided upon requirement. An optional Spacer Coupler shall be available in order to allow for replacement of mechanical seals and bearings without disturbing pump volute or movement of the pump's motor and electrical connections.

D. The pump manufacturer shall provide an OSHA approved coupling guard, which shall be mounted between the pump and motor.

E. Base frame shall be cast iron or welded structural steel with securely welded cross members and integral drip pan. The minimum base plate stiffness shall conform to ANSI/HI 1.3-2000, section

1.3.5.3 for *Horizontal Base Plate Design* standards. Bases shall be groutable.

- F. Pump rotation shall be clockwise as viewed from the motor end.
- G. Pump shall be of a maintainable design for ease of maintenance and should use machine fit parts that are easily disassembled.
- H. Each pump shall be painted with one coat of high quality factory approved paint and name-plated before shipment from the factory.
- I. Where noted on schedule the pump shall also be NSF-50 or NSF-61 certified.
- J. Pumps shall be manufactured and assembled in an ISO-9001 certified facility.

2.1.2 MOTORS

- A. Motors shall meet scheduled horsepower, speed, voltage, and enclosure design. Pump and motors shall be factory aligned, and shall be realigned after installation by the manufacturer's representative.
- B. Motors shall be suitably sized per ISO5199 and shall meet NEMA specifications and conform to the standards outlined in EISA 2007.

2.2 INSTALLATION

The pump shall be installed per manufacturer's recommendations. The pumps shall be realigned by the contractor, according to the standards of the Hydraulics Institute, after grouting of the base and connection of piping.

2.3 TESTING

Where noted on schedule, pumping equipment may require one or more of the following:

Certified Performance test

Hydro static test

NPSH Test

Any other factory test as noted in the pump Schedule

The testing shall be in accordance with Hydraulic Institute level B or the latest HI standard as noted in the pump schedule.

2.4 WARRANTY

The warranty period shall be a non-prorated period of 12 months from date of installation, not to exceed 18 months from date of manufacture. Warranty shall cover against defective material and/or faulty workmanship.

END OF SECTION

Controls Specification

REFERENCE STANDARDS

The work in this section is subject to the requirements of applicable portions of the following standards:

- a. ANSI – American National Standards Institute
- b. ASTM – American Society for Testing and Materials
- c. IEEE – Institute of Electrical and Electronics Engineers
- d. NEMA – National Electrical Manufacturers Association
- f. NEC – National Electrical Code
- g. UL – Underwriters Laboratories, Inc.

3.1. Equipment Enclosure And Accessories

a. Equipment Enclosure

The pump control panel enclosure shall be rated UL Type 3R (painted steel) for outdoor use. Enclosure shall be designed to enclose electrical and electronic equipment and protect against harsh, industrial environments and sized according to the application. Enclosure shall be vented to maintain operating temperature. Enclosure shall be Saginaw or approved equal.

b. Power Distribution

i. Fuses & Fuse Holders

Fuses shall be of the type, voltage and amperage required for adequate protection of control transformer. All fuses shall be installed in compatible fuse holders. Fuses shall be Ferraz, Bussman or approved equal. ii. Power Distribution Blocks (PDB)

PDB shall be of the voltage and ampere rating required for adequate distribution of incoming power circuits. PDB shall accept copper and aluminum conductors. PDB connectors shall be highly conductive tin-plated aluminum. PDB shall be Mersen MPDB Series or approved equal.

c. Main Disconnect

Main disconnect shall be non-fused and of the horsepower, voltage and amperage required. Disconnect shall be ABB series or approved equal.

d. Pump Circuit Breakers

Pump circuit breakers shall be of the type, voltage and amperage required for adequate protection of the 480V control panel. Pump circuit breaker shall be thermal-magnetic UL489 and shall be 18kAIC or greater. Pump circuit breakers shall be Square D HDL series or approved equal.

e. Control Power Transformer

Control power transformer shall be panel mount, UL Listed, epoxy encapsulated core and coil type. Size control power transformer as required to provide 120-volt power for internal control circuits with 50% spare. Transformer shall be Square D, Type T series or approved equal.

f. Terminal Blocks

Provide terminals for all control circuit wire terminations for both field wiring and internal wiring. Terminals shall be capable of terminating #18-10 AWG stranded wires. Terminals shall be equipped with labeling devices designed specifically for use with provided terminal blocks. Terminals shall be Siemens 8WA1 or approved equal.

g. Motor Starter

Starter for motor starting shall be IEC rated with 120-volt coil and one normally open and one normally closed auxiliary contact. The overload shall be solid state with adjustable trip dial and shall disable the motor during an overload condition. The overload shall include a manual reset. Select starter appropriate for the horsepower, voltage, and current of the motor being started. Provide one starter for each pump. Motor starter shall be Schneider or approved equal.

h. Phase Monitor (PFR)

Phase monitor shall be rated for 480 volts, 3 phases. PFR shall continuously monitor 3phase power for abnormal conditions. PFR shall detect phase loss on a loaded motor even when regenerated voltage is present. PFR shall consist of a solid state voltage and phase-angle sensing circuit. PFR shall automatically when fault is corrected. Phase monitor shall be Time Mark Model 257 or approved equal.

i. Alternating Relay

Alternating relays shall be designed for duplex pumping stations to equalize pump run times. Alternator shall be a solid state circuitry driving an electromechanical relay. Relay to have 10A contacts and standard 8 pin configuration. Alternating relay to be used with DIN rail mounted socket. Relays shall be Time Mark or approved equal.

3.2. Operator Interface Devices

a. General

All operator interface devices shall be located on the internal swingout panel front unless indicated otherwise. Each device shall be labeled according to its function and the designation of any associated equipment.

b. H-O-A Switch

The H-O-A switch shall be selector type and mounted on the internal swingout panel of the enclosure, and shall be Schneider approved equal. One H-O-A switch shall be supplied for each pump. Each H-O-A switch shall be labeled according to function and designation of the associated pump.

c. Hour Meters

Hour meters shall be mounted on the internal swingout panel of the enclosure. Hour meters shall be rated 120VAC, 60Hz. Hour meters shall be 7 digits and non-resettable. Hour meters shall be Grasslin FWZ Series or approved equal.

3.3. Process Meter

a. Hardware

- i. The analog panel meter shall be able to accept 4-20 mA signal input. The meter shall employ a bright LED display with red sunlight readable characters.
- ii. The meter shall display the following as status readings from a single display on the front:

a. Current station pressure

- iii. The meter shall have as a minimum the following hardware inputs and outputs:

- a. One analog input (4-20mA or 0-10VDC)
- b. Four digital outputs

3.4. Variable Frequency Drives

a. Provide enclosed variable frequency drives suitable for operation at the current, voltage, and horsepower indicated. VFD shall be 480 volts, 60 Hz, 3 Phase. Conform to requirements of NEMA ICS 3.1. VFD shall be iQpump drive series, manufactured by Yaskawa America Inc. b. Ratings

- i. VFD must have Normal Duty ratings and to optimize the VFD size for fan and pump applications.
- ii. VFD must operate, without fault or failure, when voltage varies plus 10% or minus 15% from rating, and frequency varies plus or minus 5% from rating.
- iii. Displacement Power Factor: 0.98 over entire range of operating speed and load.
- iv. Service factor: 1.0
- v. Operating Ambient Temperature: NEMA 1 (IP20): -10°C to 40°C (14°F to 104°F); Open Chassis: -10°C to 50°C (14°F to 122°F).
- vi. Ambient storage temperature: -20°C to 60°C (-4°F to 140°F).
- vii. Humidity: 0% to 95%, non-condensing.
- viii. Altitude: Up to 3,300 feet (1000m), higher altitudes achieved by derating.
- ix. Vibration: 9.81m/s² (1 G) from 10 to 20 Hz; 2.0 m/s² (0.2 G) from 20 Hz to 55 Hz.
- x. Minimum Efficiency: 96% at half speed; 98% at full speed.
- xi. Starting Torque: 100% starting torque shall be available from 0.5 Hz to 3 Hz; 150% starting torque shall be available from 3 Hz to 60 Hz.
- xii. Overload capability: 120% of rated FLA for 60 seconds; 170% of rated FLA peak.
- xiii. Controlled speed range: 40:1
- xiv. VFDs must be suitable for use on a circuit capable of delivering not more than 100,000 RMS symmetrical amperes.
- xv. The VFD must meet the requirements for Radio Frequency Interference (RFI) above 7 MHz as specified by FCC regulations, part 15, subpart J, Class A devices.

c. Design

- i. VFD shall employ microprocessor based inverter logic, isolated from all power circuits.
- ii. VFD shall include surface mount technology with protective coating.
- iii. VFD shall be able to be mounted with the heatsink out the back of the enclosure.
- iv. VFD shall employ a PWM (Pulse Width Modulated) power electronic system, consisting of:
 - 1. Input Section:

VFD input power stage shall convert three-phase AC line power into a fixed DC voltage via a solid-state full wave diode rectifier, with MOV (Metal Oxide Varistor) surge protection.
 - 2. Intermediate Section:
 - a. DC bus as a supply to the VFD output Section shall maintain a fixed voltage with filtering and short circuit protection.

- b. DC bus shall be interfaced with the VFD diagnostic logic circuit, for continuous monitoring and protection of the power components.
- c. A minimum of 3% DC bus impedance to minimize reflected current (40 HP and larger).

3. Output Section

- a. Insulated Gate Bipolar Transistors (IGBTs) shall convert DC bus voltage to variable frequency and voltage.
 - b. The VFD shall employ PWM sine coded output technology to power the motor.
- v. VFD shall offer a low noise, low carrier frequency settings.
 - vi. VFD shall employ a common main control board from 0.5HP to 1000HP with a common control connection diagram for all ratings.
 - vii. VFD shall employ a switching logic power supply operating from the DC bus.
 - viii. VFD shall be designed to shut down with no component failure in the event of an output phase to phase or phase to ground short circuit and provide annunciation of the fault condition.
 - ix. VFD must have plated bus bar to resist corrosion.
 - x. VFD shall have an adjustable carrier frequency, from 1 kHz to 15 kHz below 100 HP; 1 kHz to 10 kHz from 100 HP to 300 HP; 1 kHz to 5 kHz 350 HP and larger. (480 V Class).
 - xi. VFD must have a motor noise control function that monitors the load at all times and reduces the output voltage automatically, reducing motor audible noise.
 - xii. VFD shall be able to be mounted next to each other with zero clearance for ratings up to 30 HP.
 - xiii. VFD shall have embedded Modbus RTU/Memobus accessible via a RS-422/485 communication port. The termination resistor shall be built-in.
 - xiv. VFD shall include three independent multi-function analog inputs, individually selectable for 0-10 VDC, -10 to +10 VDC, 0-20 mA or 4-20 mA. Each input shall have a programmable bias and gain. The inputs shall be individually programmed for, but not limited to:
 - 1. PID Set Point
 - 2. PID Feedback
 - 3. Pressure Level
 - 4. Flow Level
 - 5. Depth Level
 - xv. VFD shall include eight independent multi-function digital input terminals that can be set for sinking/sourcing and internal/external power supplies. The inputs shall be individually programmed for, but not limited to:
 - 1. Hand – Off – Auto operation Selection
 - 2. Detection of External Fault Condition
 - 3. Remote Reset
 - 4. Multi-step Speed Commands
 - 5. Run Permissive

6. Floating Control
7. Check Valve input alarm/fault
8. High or low level Alarm/fault
9. High or Low input pressure Alarm/fault
10. High pressure alarm/fault
11. Pump pre-charge

xvi. VFD shall include two individually selectable 0-10 VDC, -10 to +10 VDC, or 4-20 mA analog outputs. The outputs shall be individually programmed for, but not limited to:

1. Output Frequency
2. Output Current
3. Output Power
4. PID Feedback

xvii. VFD shall include one fixed form "C" fault contact, two programmable multifunction form "A" contacts, and one programmable form "C" contact. These output relay contacts shall all be rated for 1A at 250 VAC and shall be programmed for, but not limited to:

1. Pump Fault
2. Low and High Pressure Detection
3. Pump Over Cycling Detection
4. Loss of Prime Detection.
5. Drive Fault
6. Over/Under Torque Detection
7. Not Maintaining Set Point Detection
8. No Flow Detection
9. Thrust Bearing Start
10. Low Input Pressure
11. Low/high Flow Level
12. Anti-Jam Protection
13. De-scale Operation

xviii. VFD shall provide terminals for remote input contact closure, to allow starting in the automatic mode.

xix. VFD shall provide 24 VDC, 150ma transmitter power supply for powering transducer feedback devices.

xx. VFD shall include an external fault input function to be programmed a digital input, which shall be programmable for a normally open or normally closed contact. These terminals can be used for the connection of firestats, freezestats, or similar safety devices.

xxi. VFD shall include a control power loss ride through capable of 2 seconds.

xxii. VFD shall have DC injection braking capability that is adjustable and current limited.

xxiii. VFD shall have a bidirectional speed search function to catch a spinning motor, regardless of its direction.

xxiv. VFD unit shall include the following meters to estimate use of energy:

1. Elapsed Time Meter
2. Kilowatt Meter
3. Kilowatt Hour Meter

xxv. VFD shall have a fault trace function to capture relevant monitor values at the time of the most recent fault. This includes a time/date stamp of when the fault occurred.

- xxvi. VFD shall have a motor preheat function to prevent moisture accumulation in an idle motor.
- xxvii. VFD shall have a motor auto-tuning function capable of automatically determining the motor's electrical characteristics for maximum torque production and minimum energy usage.
- xxviii. VFD shall include diagnostic fault history with the last 10 fault indications in the selected keypad language and time/date stamp as well as heatsink cooling fan operation hours.
- xxix. VFD shall have preventative maintenance monitors for predicting the remaining life of the IGBTs, cooling fans, bus capacitors and pre-charge relay.
- xxx. VFD shall turn off its cooling fans when not running to increase fan life.
- xxxi. VFD shall have the following minimum protective functions: Overheat, motor overload, VFD overload, short circuit, overvoltage, undervoltage, input phase loss, output phase loss, output ground fault and overcurrent.
- xxxii. VFD shall have a USB port for easy connection to a computer (PC) for startup and troubleshooting.
- xxxiii. VFD manufacture shall provide free PC software that includes online and offline parameter management, application wizards, oscilloscope function, network configurator for Ethernet, parameter conversion tool and diagnostic functions.
- xxxiv. VFD shall have an eight-language removable HOA Keypad with an illuminated LCD display. The operator shall have program copy and storage functions to simplify the set up of multiple drives. The HOA Keypad shall be interchangeable for all drive ratings. The operator will provide complete programming, operating, monitoring, and diagnostic capabilities.
- xxxv. VFD shall have a keypad with dedicated Hand-Off-Auto keys. The keys shall include industry standard commands for Hand, Off, and Auto functions.
- xxxvi. VFD shall have an internal real time clock. The internal time clock shall include a back-up via battery. The time clock will be used to date and time stamp faults and record operating parameters at the time of fault. The internal time clock can be programmable to control start/stop functions, running speeds, PID parameter sets and digital output relays.
- xxxvii. VFD keypad shall provide plain language display readouts of output frequency in hertz, PI feedback in percent, pump speed in RPM, set point and feedback level in programmable engineering units (PSI, GPM, etc.), output voltage in volts, output current in amps, output power in kilowatts, D.C. bus voltage in volts, control terminal status, heatsink temperature in degrees and fault conditions in the selected keypad language.

- xxxviii. VFD parameter settings shall be stored in non-volatile memory that does not require a battery backup.
- xxxix. VFD shall be designed to allow all parameter adjustments to be made with the door closed.
- xl. VFD shall have selectable and user-customizable engineering units for easy configuration of keypad displays to match process and feedback labels in units such as PSI, GPM, and Feet.
- xli. VFD shall include a user selectable PID control loop, to provide closed loop set point control capability, from a feedback signal, eliminating the need for closed loop output signals from a building automation system. The PID controller shall have a differential feedback capability for closed loop control of pumps for pressure, flow or temperature regulation in response to dual feedback signals.
- xl.ii. VFD shall have an independent, PID loop that can be used with an analog input that will vary a VFD analog output and maintain a set point of an independent process (valves, dampers....).
- xl.iii. VFD shall include pump-specific application presets. The parameter presets can be used to help facilitate start-up. The presets will program all parameters and customer interfaces for a particular application (Pump Down Level, Geothermal, Vertical Turbine) to reduce programming time.
- xliv. VFD shall include an energy saving "sleep" function shall be available, providing significant energy savings while minimizing operating hours on driven equipment. When the sleep function senses minimal deviation of a feedback signal from set point or low demand, the system reacts by stopping the driven equipment. Upon receiving an increase in speed command signal deviation, the drive and equipment resume normal operation.
- xl. v. VFD shall include loss of input signal protection, with a selectable response strategy including running at a preset speed or a percentage of the most recent speed.
- xl. vi. VFD shall have an underload detection function that monitors the load and will stop the system in the event of a pump shaft failure.
- xl. vii. VFD shall include electronic thermal overload protection for both the drive and motor. The electronic thermal motor overload shall be approved by UL.
- xl. viii. VFD shall have a quick disconnect, removable control wiring terminal board that stores the drive's parameter settings. The terminal board can be installed into a new drive and transfer all settings to the new drive. The control wiring shall not need to be removed.
- xl. ix. VFD shall use 24 VDC cooling fans for all ratings. Fans shall be mounted at the top of the drive for easier access. No tools shall be required to replace the fans.
- l. VFD shall include the following additional program functions:
 - 1. Capability to reset all parameters back to the factory settings.
 - 2. Capability to reset all parameters back to a user-defined set of parameters.
 - 3. Capability to see only the parameters that have been modified.

4. Ability to set the motor speed (PI set point) in Hertz, RPM, percent or custom units with units label.
5. Critical frequency rejection capability: 3 selectable, adjustable dead bands to lock out continuous operation at frequencies that may product mechanical resonance.
6. Auto restart capability: 0 to 10 attempts with adjustable delay between attempts.
7. Ability to close fault contact after the completion of all fault restart attempts.
8. Kinetic Energy Braking (KEB) function for stopping at power loss.
9. Overvoltage suppression function for cyclic regenerative loads.
10. Stall prevention capability.
11. "S" curve soft start / soft stop capability with four programmable corners.
12. Four sets of acceleration/deceleration times, selectable via digital input.
13. Acceleration/deceleration adjustment from 0.00 to 6000 seconds while running.
14. Fourteen preset and 1 custom volts per hertz patterns.
15. Programmable security code to prevent parameter setting changes.
16. Heatsink over temperature speed fold back capability.
17. Control I/O Terminal status indication.
18. Motor thermistor input.
19. Reverse direction lockout.
20. Current limit adjustment from 30% to 200% of rated current of the motor.
21. Input signal or serial communication loss detection and response strategy.
22. Automatic energy saving function.
23. Under torque/Over torque Detection.
24. Overexcitation braking function to quickly stop the motor.
25. Cooling fan failure detection and selectable drive action.
26. Select any of seventeen preset speeds while running.
27. Ability to remove of HOA Keypad during VFD operation.

3.5. Device Labeling

External or flush mounted devices shall be labeled with engraved laminated phenolic nameplates secured with permanent pressure sensitive adhesive. Internal labels shall be white polyester permanent pressure sensitive tape printed with black thermal transfer lettering.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine areas, equipment foundations, and conditions, for compliance with requirements for installation tolerances and other conditions affecting performance of pumps.
- B. Examine rough-in for piping systems to verify actual locations of piping connections prior to installation.
- C. Examine equipment foundations and/or inertia bases for suitable conditions where pumps are to be installed.
- D. Correct unsatisfactory conditions prior to installation of pumps.

3.2 INSTALLATION

- A. General: Comply with the ANSI/HI 1.4-2000 and manufacturer's written installation and alignment instructions. Install in a professional manner. Any part or parts not meeting this requirement shall be replaced or rebuilt without extra expense to Owner.
- B. Refer to the drawings for details of booster installation.
- C. Install booster package in specified location. Provide access for periodic maintenance, including removal of motors, impellers, and accessories.
- D. Verify proper pump rotation at start-up. E. Perform start-up procedures per manufacturer's instructions.

F. Install rotating equipment in static and dynamic balance.

G. Provide foundations, supports, and isolators properly adjusted to allow minimum vibration transmission within the building.

H. Correct objectionable noise or vibration transmission in order to operate equipment satisfactorily as determined by the Engineer.

3.3 ADJUSTING

A. Adjust pressure and temperature setpoints.