

**PROJECT MANUAL FOR THE**  
**RAWLS SPRINGS UTILITY DISTRICT**  
**WATER SYSTEM IMPROVEMENTS – 2020**

**Contract Number 1 – Waterline and Tank Sites Improvements**

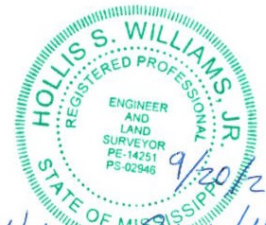
**August 2021**

FOR VIEWING ONLY  
NOT FOR BIDDING PURPOSES

SET NO. \_\_\_\_\_

**PREPARED BY:**

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# TABLE OF CONTENTS

## RAWLS SPRINGS UTILITY DISTRICT WATER SYSTEM IMPROVEMENTS – 2020

### Contract Number 1 – Waterline and Tank Sites Improvements

#### A. Bidding Requirements

Advertisement for Bids .....	C-111
Instructions to Bidders .....	C-200
Qualifications Statement.....	C-451
Bid Form .....	C-410
Bid Bond .....	C-430
Notice of Award .....	C-510

#### B. Contract Forms

Contract Agreement .....	C-520
General Conditions .....	C-700
Supplementary Conditions .....	C-800
Performance Bond.....	C-610
Payment Bond .....	C-615
Application for Payment.....	C-620
Change Order .....	C-941
Notice to Proceed .....	C-550
Certificate of Substantial Completion.....	C-625

#### C. USDA RUS Documents

Compliance Statement .....	RD 400-6
Certification of Non-Segregated Facilities .....	RD 400-6
Certification Regarding Debarment, Suspension Ineligibility and Voluntary Exclusion – Lower Tier Covered Transactions .....	AD-1048
Certification for Contracts, Grants, and Loans.....	RD 1940Q A-1
Construction Project Signs .....	PS-1
Certificate of Owner’s Attorney .....	RD 1780-26 Exhibit I
Engineer’s Certification of Final Plans and Specifications .....	RD 1780-26 Exhibit J
Implementation American Iron and Steel (AIS).....	RD 1780-35 Ex. A-J
Requirements with Rural Utilities Service (RUS)	

#### D. Technical Specifications

## **A. BIDDING REQUIREMENTS**

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# ADVERTISEMENT FOR BID

## RAWLS SPRINGS UTILITY DISTRICT WATER SYSTEM IMPROVEMENTS - 2020

### Contract Number 1 – Waterline and Tank Sites Improvements

Sealed Bids for the construction of the referenced project will be received, by the Rawls Springs Utility District, at the office of the Rawls Springs Utility District at 39 Archie Smith Road, Hattiesburg, MS 39402, until **2:00 pm** local time on **October 15, 2021**, at which time all properly received bids will be publicly opened and read. The Project consists of constructing water mains, chlorination equipment, fluoridation equipment, master water meters, variable frequency drives, SCADA system, electrical improvements, water level controls, access drive, chain link fencing and other improvements.

Bids will be received for a single prime Contract. Bids shall be on a unit price basis, with additive alternate bid items as indicated in the Bid Form.

The **Issuing Office** for the Bidding Documents is: **W Engineering, P.A.**, 301 Central Avenue East, Wiggins, MS 39577, telephone 601 928-5981. Contact person is Hollis S. "Pete" Williams, P.E. at 601 928-5984 and at pw@weng-ms.com. Prospective Bidders may examine the Bidding Documents at the Issuing Office on Mondays through Fridays between the hours of 9:00 am and 4:00 pm, and may obtain copies of the Bidding Documents from the Issuing Office.

Bidding Documents may be obtained from the Issuing Office during the hours indicated above. Bidding Documents are available on compact disc (as portable document format (PDF) files) for a non-refundable charge of **\$45.00**, plus shipping cost. Alternatively, printed Bidding Documents may be obtained from the Issuing Office either via in-person pick-up or via mail, upon Issuing Office's receipt of payment for the Bidding Documents. The non-refundable cost of printed Bidding Documents is **\$115.00** per set, payable to

"W Engineering, P.A.", plus a non-refundable shipping charge. Upon Issuing Office's receipt of payment, printed Bidding Documents will be sent via the prospective Bidder's delivery method of choice; the shipping charge will depend on the shipping method chosen. The date that the Bidding Documents are transmitted by the Issuing Office will be considered the prospective Bidder's date of receipt of the Bidding Documents. Partial sets of Bidding Documents will not be available from the Issuing Office. Neither Owner nor Engineer will be responsible for full or partial sets of Bidding Documents, including Addenda if any, obtained from sources other than the Issuing Office.

A pre-bid conference will be held at **2:00 p.m.** local time on **October 07, 2021** at the office of the Rawls Springs Utility District. Attendance at the pre-bid conference is highly encouraged but is not mandatory.

Bid security shall be required in accordance with the Instructions to Bidders.

"Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference applies an American Iron and Steel requirement to this project. All listed iron and steel products used in this project must be produced in the United States. The term "iron and steel products" means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials. The deminimis and minor components waiver apply to this contract."

Owner: **Rawls Springs Utility District**

By: \_\_\_\_\_  
Ray Anthony "Tony" Muli

Title: President

Date: \_\_\_\_\_

Publication Dates: (1<sup>st</sup> Advertisement) September 16, 2021

(2<sup>nd</sup> Advertisement) September 23, 2021

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# INSTRUCTIONS TO BIDDERS

## RAWLS SPRINGS UTILITY DISTRICT WATER SYSTEM IMPROVEMENTS - 2020 Contract Number 1 – Waterline and Tank Sites Improvements

### TABLE OF CONTENTS

	Page
Article 1 – Defined Terms.....	1
Article 2 – Copies of Bidding Documents.....	1
Article 3 – Qualifications of Bidders.....	1
Article 4 – Site and Other Areas; Existing Site Conditions; Examination of Site; Owner’s Safety Program; Other Work at the Site.....	1
Article 5 – Bidder’s Representations.....	3
Article 6 – Pre-Bid Conference.....	4
Article 7 – Interpretations and Addenda.....	4
Article 8 – Bid Security.....	4
Article 9 – Contract Times.....	4
Article 10 – Liquidated Damages.....	5
Article 11 – Substitute and “Or-Equal” Items.....	5
Article 12 – Subcontractors, Suppliers, and Others.....	5
Article 13 – Preparation of Bid.....	6
Article 14 – Basis of Bid.....	7
Article 15 – Submittal of Bid.....	7
Article 16 – Modification and Withdrawal of Bid.....	8
Article 17 – Opening of Bids.....	8
Article 18 – Bids to Remain Subject to Acceptance.....	8
Article 19 – Evaluation of Bids and Award of Contract.....	8
Article 20 – Bonds and Insurance.....	9
Article 21 – Signing of Agreement.....	9
Article 22 – Sales and Use Taxes.....	10
Article 23 – Contracts to be Assigned.....	10
Article 24 – Federal Requirements.....	10

## **ARTICLE 1 – DEFINED TERMS**

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

A. *Issuing Office* – The office from which the Bidding Documents are to be issued.

## **ARTICLE 2 – COPIES OF BIDDING DOCUMENTS**

2.01 Complete sets of the Bidding Documents may be obtained from the Issuing Office in the number and format stated in the advertisement.

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

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

## **ARTICLE 3 – QUALIFICATIONS OF BIDDERS**

3.01 To demonstrate Bidder's qualifications to perform the Work, Bidder shall submit with its Bid (a) written evidence establishing its qualifications such as financial data, previous experience, and present commitments.

3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.

3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

3.04 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

## **ARTICLE 4 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE**

4.01 *Site and Other Areas*

A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

4.02 *Existing Site Conditions*

A. Subsurface and Physical Conditions; Hazardous Environmental Conditions

1. No reports or subsurface exploration are known of by the owner, likewise the owner does not know of any hazardous environmental conditions. Contractor is encouraged to examine the project site to evaluate subsurface conditions that could impact construction. Permission to dig test holes in specific locations shall be granted after

Contractor notifies the Engineer and Mississippi One Call. Contractor shall restore all test hole locations by neatly backfilling, fertilizing, seeding and mulching.

2. The Supplementary Conditions do not identify Technical Data, therefore the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.
- B. **Underground Facilities:** Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or adjacent to the Site are set forth in the Contract Documents and are based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.
- C. **Adequacy of Data:** Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 5.03, 5.04, and 5.05 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 5.06 of the General Conditions.

#### 4.03 *Site Visit and Testing by Bidders*

- A. Bidder shall conduct the required Site visit during normal working hours, and shall not disturb any ongoing operations at the Site.
- B. Bidder is not required but encouraged to conduct any subsurface testing, or exhaustive investigations of Site conditions..
- C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site.
- D. Bidder shall comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.
- E. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

#### 4.04 *Owner's Safety Program*

- A. Site visits and work at the Site may be governed by an Owner safety program. As the General Conditions indicate, if an Owner safety program exists, it will be noted in the Supplementary Conditions.

#### 4.05 *Other Work at the Site*

- A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to



the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

## ARTICLE 5 – BIDDER’S REPRESENTATIONS

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

- A. examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;
- B. visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
- C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work including but not limited to American Iron and Steel requirements as mandated by Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A – Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference which apply to the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials.
- D. consider the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder’s safety precautions and programs;
- E. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;
- F. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
- G. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;
- H. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work; and
- I. agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

## ARTICLE 6 – PRE-BID CONFERENCE

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

## ARTICLE 7 – INTERPRETATIONS AND ADDENDA

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

7.02 Addenda may be issued to clarify, correct, supplement, or change the Bidding Documents.

## ARTICLE 8 – BID SECURITY

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of **5%** percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a certified check, bank money order, or a Bid bond (on the form included in the Bidding Documents) issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.

8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract Documents, furnished the required contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults.

8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

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

## ARTICLE 9 – CONTRACT TIMES

9.01 The number of days within which, or the dates by which, the Work is to be substantially completed, and completed and ready for final payment, are set forth in the Agreement.

## ARTICLE 10 – LIQUIDATED DAMAGES

- 10.01 Provisions for liquidated damages, if any, for failure to timely attain a Substantial Completion or completion of the Work in readiness for final payment, are set forth in the Agreement.

## ARTICLE 11 – SUBSTITUTE AND “OR-EQUAL” ITEMS

- 11.01 The Contract for the Work, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, and those “or-equal” or substitute materials and equipment subsequently approved by Engineer prior to the submittal of Bids and identified by Addendum. No item of material or equipment will be considered by Engineer as an “or-equal” or substitute unless written request for approval has been submitted by Bidder and has been received by Engineer at least 15 days prior to the date for receipt of Bids in the case of a proposed substitute and 5 days prior in the case of a proposed “or-equal”. Each such request shall comply with the requirements of Paragraphs 7.04 and 7.05 of the General Conditions. Each such request shall include Manufacturer’s Certification letter for compliance with Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A – Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference, if applicable. Refer to Manufacturer’s Certification Letter provided in these Contract Documents. The burden of proof of the merit of the proposed item is upon Bidder. Engineer’s decision of approval or disapproval of a proposed item will be final. If Engineer approves any such proposed item, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner. Substitutes and “or-equal” materials and equipment may be proposed by Contractor in accordance with Paragraphs 7.04 and 7.05 of the General Conditions after the Effective Date of the Contract.
- 11.02 All prices that Bidder sets forth in its Bid shall be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of “or-equal” or substitution requests are made at Bidder’s sole risk.
- 11.03 If an award is made, Contractor shall be allowed to submit proposed substitutes and “or-equals” in accordance with the General Conditions

## ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- ~~12.01 A Bidder shall be prepared to retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of the Work if required by the Bidding Documents (most commonly in the Specifications) to do so. If a prospective Bidder objects to retaining any such Subcontractor, Supplier, or other individual or entity, and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.~~
- ~~12.02 Subsequent to the submittal of the Bid, Owner may not require the Successful Bidder or Contractor to retain any Subcontractor, Supplier, or other individual or entity against which Contractor has reasonable objection.~~
- 12.03 If required by the bid documents the apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of the Subcontractors or Suppliers proposed to be paid more than 10% of the total contract amount.

Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, or

other individual or entity. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder shall submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

- 12.04 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, or other individuals or entities. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.06 of the General Conditions.
- 12.05 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.
- 12.06 The Contractor shall not award work to Subcontractor(s) in excess of the limits stated in SC 7.06A.

#### **ARTICLE 13 – PREPARATION OF BID**

- 13.01 The Bid Form is included with the Bidding Documents. All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.
- 13.02 A Bid by a corporation shall be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation shall be shown, and also the corporate seal shall be affixed and attested by the corporate secretary or an assistant corporate secretary.
- 13.03 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The partnership's address for receiving notices shall be shown.
- 13.04 A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the firm's address for receiving notices shall be shown.
- 13.05 A Bid by an individual shall show the Bidder's name and address for receiving notices.
- 13.06 A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture's address for receiving notices shall be shown.
- 13.07 All names shall be printed in ink below the signatures.
- 13.08 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 13.09 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 13.10 The Bid shall contain evidence of Bidder's Certificate of Responsibility Number.

**ARTICLE 14 – BASIS OF BID**

14.01 Base Bid with Alternates

- A. Bidders shall submit a Bid unit price bid with a Total Base Bid Price, and also a unit price bid with a total for each alternate described in the Bidding Documents and as provided for in the Bid Form. The price for each alternate will be the amount added to or deleted from the base Bid if Owner selects any or all of the alternates.
- B. In the comparison of Bids, alternates will be applied in any order the owner wishes or no alternates at all. Priority will not necessarily be given to the alternates as they are numbered and listed in these documents.

14.02 Unit Price

- A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.
- B. The “Bid Price” (sometimes referred to as the extended price) for each unit price Bid item will be the product of the “Estimated Quantity” (which Owner or its representative has set forth in the Bid Form) for the item and the corresponding “Bid Unit Price” offered by the Bidder. The total of all unit price Bid items will be the sum of these “Bid Prices”; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.
- C. Discrepancies between the multiplication of units of Work and unit prices will be resolved **in favor of the unit prices**. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

14.03 Allowances - No cash allowances are allowed in this contract.

**ARTICLE 15 – SUBMITTAL OF BID**

15.01 With each copy of the Bidding Documents, a Bidder is furnished one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of **Article 7 of the Bid Form**.

15.02 A Bid shall be received no later than the date, time, and at the place indicated in the advertisement for bid.

- A. Bids must be enclosed in an opaque sealed envelope and addressed to:

**Rawls Springs Utility District  
39 Archie Smith Road  
Hattiesburg, MS 39402**

The upper left hand corner of the sealed envelope must identify the following information:

**CONTRACT PROPOSAL**

Bid of \_\_\_\_\_  
Name of Contractor

Water System Improvements – 2020  
Contract Number 1 – Waterline and Tank Sites Improvements  
To be opened at the date, time and at the place indicated in the advertisement for bid  
Bidder Certificate of Responsibility Number: \_\_\_\_\_

- B. Bid shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed to Rawls Springs Utility District as indicated above.
- 15.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

#### **ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID**

- 16.01 A Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.
- 16.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 16.01 and submit a new Bid prior to the date and time for the opening of Bids.
- 16.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder may be disqualified from further bidding on the Work.

#### **ARTICLE 17 – OPENING OF BIDS**

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

#### **ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE**

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

#### **ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT**

- 19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible. If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, then the Owner will reject the Bid as nonresponsive; provided that Owner also reserves the right to waive all minor informalities not involving price, time, or changes in the Work.
- 19.02 If Owner awards the contract for the Work, such award shall be to the responsible Bidder submitting the lowest **and best** responsive Bid.
- 19.03 Evaluation of Bids

- A. In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.
- B. In the comparison of Bids, alternates will be applied in any order the owner wishes and not necessarily the same order as listed in the Bid Form. To determine the Bid prices for purposes of comparison, Owner shall announce to all bidders a "Base Bid plus alternates" budget after receiving all Bids, but prior to opening them. Alternates will be accepted in any order the owner wishes. After determination of the Successful Bidder based on the alternates the owner decides and on the responsiveness, responsibility, and other factors set forth in these Instructions, the award may be made to said Successful Bidder on its base Bid plus that combination of alternates the owner decided at a time after the bids are open.
- ~~C. Bid prices will be compared after adjusting for differences in time of Substantial Completion (total number of calendar days to substantially complete the Work) designated by Bidders. The adjusting amount will be determined at the rate set forth in the Agreement for liquidated damages for failing to achieve Substantial Completion, or such other amount that Owner has designated in the Bid Form.~~
- ~~1. The method for calculating the lowest bid for comparison will be the summation of the Bid price shown in the Bid Form plus the product of the Bidder specified time of Substantial Completion (in calendar days) times the rate for liquidated damages [or other Owner designated daily rate] (in dollars per day).~~
  - ~~2. This procedure is only used to determine the lowest bid for comparison and contractor selection purposes. The Contract Price for compensation and payment purposes remains the Bid price shown in the Bid Form.~~
- 19.04 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.
- 19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

## **ARTICLE 20 – BONDS AND INSURANCE**

- 20.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the Agreement (executed by Successful Bidder) to Owner, it shall be accompanied by required bonds and insurance documentation.

## **ARTICLE 21 – SIGNING OF AGREEMENT**

- 21.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder shall execute and deliver the required number of counterparts of the Agreement (and any bonds and insurance documentation required to be delivered by the Contract Documents) to Owner. Within ten days thereafter, Owner shall deliver one fully executed counterpart of the Agreement to Successful

Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

**ARTICLE 22 – SALES AND USE TAXES – NOT APPLICABLE FOR THIS CONTRACT**

**ARTICLE 23 – CONTRACTS TO BE ASSIGNED – NOT APPLICABLE FOR THIS CONTRACT**

**ARTICLE 24 – FEDERAL REQUIREMENTS**

24.01 Federal requirements at Article 19 of the Supplementary Conditions apply to this Contract.

24.02 Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A – Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference applies an American Iron and Steel requirement to this project. All iron and steel products used in this project must be produced in the United States. The term “iron and steel products” means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials. The de minimis and minor components waiver *{add project specific waivers as applicable}* apply to this contract.

FOR VIEWING ONLY  
NOT FOR BIDDING PURPOSES



## QUALIFICATIONS STATEMENT

THE INFORMATION SUPPLIED IN THIS DOCUMENT IS CONFIDENTIAL TO THE EXTENT  
PERMITTED BY LAWS AND REGULATIONS

**1. SUBMITTED BY:**

Official Name of Firm: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**2. SUBMITTED TO:**

Rawls Springs Utility District

**3. SUBMITTED FOR:**

Evaluation of General Contractor as Bidder

Owner:

Rawls Springs Utility District

Project Name:

Rawls Springs Utility District Water System Improvements - 2020

Contract Number 1 – Waterline and Tank Sites Improvements

**TYPE OF WORK:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**4. CONTRACTOR'S CONTACT INFORMATION**

Contact Person: \_\_\_\_\_

Title: \_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

**5. AFFILIATED COMPANIES:**

Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**6. TYPE OF ORGANIZATION:**

SOLE PROPRIETORSHIP

Name of Owner: \_\_\_\_\_

Doing Business As: \_\_\_\_\_

Date of Organization: \_\_\_\_\_

PARTNERSHIP

Date of Organization: \_\_\_\_\_

Type of Partnership: \_\_\_\_\_

Name of General Partner(s): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

CORPORATION

State of Organization: \_\_\_\_\_

Date of Organization: \_\_\_\_\_

Executive Officers:

- President: \_\_\_\_\_

- Vice President(s): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- Treasurer: \_\_\_\_\_

- Secretary: \_\_\_\_\_

LIMITED LIABILITY COMPANY

State of Organization:

---

Date of Organization:

---

Members:

---

---

---

---

---

JOINT VENTURE

Sate of Organization:

---

Date of Organization:

---

Form of Organization:

---

Joint Venture Managing Partner

- Name:

---

- Address:

---

---

---

Joint Venture Managing Partner

- Name:

---

- Address:

---

---

Joint Venture Managing Partner

- Name:

---

- Address:

---

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**7. LICENSING**

Jurisdiction: \_\_\_\_\_

Type of License: \_\_\_\_\_

License Number: \_\_\_\_\_

Jurisdiction: \_\_\_\_\_

Type of License: \_\_\_\_\_

License Number: \_\_\_\_\_

**8. CERTIFICATIONS**

CERTIFIED BY:

Disadvantage Business Enterprise: \_\_\_\_\_

Minority Business Enterprise: \_\_\_\_\_

Woman Owned Enterprise: \_\_\_\_\_

Small Business Enterprise: \_\_\_\_\_

Other ( \_\_\_\_\_ ): \_\_\_\_\_

**9. BONDING INFORMATION**

Bonding Company: \_\_\_\_\_

Address: \_\_\_\_\_

Bonding Agent: \_\_\_\_\_

Address: \_\_\_\_\_

Contact Name: \_\_\_\_\_

Phone: \_\_\_\_\_

Aggregate Bonding Capacity: \_\_\_\_\_

Available Bonding Capacity as of date of this submittal: \_\_\_\_\_

**10. FINANCIAL INFORMATION**

Financial Institution: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Account Manager: \_\_\_\_\_

Phone: \_\_\_\_\_

**11. CONSTRUCTION EXPERIENCE:**

Current Experience:

List on **Schedule A** all uncompleted projects currently under contract (If Joint Venture list each participant's projects separately).

Previous Experience:

List on **Schedule B** all projects completed within the last 5 Years (If Joint Venture list each participant's projects separately).

Has firm listed in Section 1 ever failed to complete a construction contract awarded to it?

YES  NO

If YES, attach as an Attachment details including Project Owner's contact information.

Has any Corporate Officer, Partner, Joint Venture participant or Proprietor ever failed to complete a construction contract awarded to them in their name or when acting as a principal of another entity?

YES  NO

If YES, attach as an Attachment details including Project Owner's contact information.

Are there any judgments, claims, disputes or litigation pending or outstanding involving the firm listed in Section 1 or any of its officers (or any of its partners if a partnership or any of the individual entities if a joint venture)?

YES  NO

If YES, attach as an Attachment details including Project Owner's contact information.

**12. SAFETY PROGRAM:**

Name of Contractor's Safety Officer: \_\_\_\_\_

Include the following as attachments:

Provide as an Attachment Contractor's (and Contractor's proposed Subcontractors and Suppliers furnishing or performing Work having a value in excess of 10 percent of the total amount of the Bid) OSHA No. 500- Log & Summary of Occupational Injuries & Illnesses for the past 5 years.

Provide as an Attachment Contractor's (and Contractor's proposed Subcontractors and Suppliers furnishing or performing Work having a value in excess of 10 percent of the total amount of the Bid) list of all OSHA Citations & Notifications of Penalty (monetary or other) received within the last 5 years (indicate disposition as applicable) - IF NONE SO STATE.

Provide as an Attachment Contractor's (and Contractor's proposed Subcontractors and Suppliers furnishing or performing Work having a value in excess of 10 percent of the total amount of the Bid) list of all safety citations or violations under any state all received within the last 5 years (indicate disposition as applicable) - IF NONE SO STATE.

Provide the following for the firm listed in Section V (and for each proposed Subcontractor furnishing or performing Work having a value in excess of 10 percent of the total amount of the Bid) the following (attach additional sheets as necessary):

Workers' compensation Experience Modification Rate (EMR) for the last 5 years:

YEAR _____	EMR _____
YEAR _____	EMR _____
YEAR _____	EMR _____
YEAR _____	EMR _____
YEAR _____	EMR _____

Total Recordable Frequency Rate (TRFR) for the last 5 years:

YEAR _____	TRFR _____
YEAR _____	TRFR _____
YEAR _____	TRFR _____
YEAR _____	TRFR _____
YEAR _____	TRFR _____

Total number of man-hours worked for the last 5 Years:

YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____
YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____
YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____
YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____
YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____

Provide Contractor's (and Contractor's proposed Subcontractors and Suppliers furnishing or performing Work having a value in excess of 10 percent of the total amount of the Bid) Days Away From Work, Days of Restricted Work Activity or Job Transfer (DART) incidence rate for the particular industry or type of Work to be performed by Contractor and each of Contractor's proposed Subcontractors and Suppliers) for the last 5 years:

YEAR	_____	DART	_____
YEAR	_____	DART	_____
YEAR	_____	DART	_____
YEAR	_____	DART	_____
YEAR	_____	DART	_____

**13. EQUIPMENT:**

MAJOR EQUIPMENT:

List on **Schedule C** all pieces of major equipment available for use on Owner's Project.

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NOT FOR BIDDING PURPOSES

I HEREBY CERTIFY THAT THE INFORMATION SUBMITTED HERewith, INCLUDING ANY ATTACHMENTS, IS TRUE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

NAME OF ORGANIZATION: \_\_\_\_\_

BY: \_\_\_\_\_

TITLE: \_\_\_\_\_

DATED: \_\_\_\_\_

NOTARY ATTEST:

SUBSCRIBED AND SWORN TO BEFORE ME

THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 20\_\_

NOTARY PUBLIC - STATE OF \_\_\_\_\_

MY COMMISSION EXPIRES: \_\_\_\_\_

REQUIRED ATTACHMENTS

1. Schedule A (Current Experience).
2. Schedule B (Previous Experience).
3. Schedule C (Major Equipment).
4. Evidence of authority for individuals listed in Section 7 to bind organization to an agreement.
5. Resumes of officers and key individuals (including Safety Officer) of firm named in Section 1.
6. Required safety program submittals listed in Section 13.
7. Additional items as pertinent.



SCHEDULE A

CURRENT EXPERIENCE

Project Name	Owner's Contact Person	Design Engineer	Contract Date	Type of Work	Status	Cost of Work
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				

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## SCHEDULE B

PREVIOUS EXPERIENCE (Include ALL Projects Completed within last 5 years)

Project Name	Owner's Contact Person	Design Engineer	Contract Date	Type of Work	Status	Cost of Work
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				

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**SCHEDULE B**

PREVIOUS EXPERIENCE (Include ALL Projects Completed within last 5 years)

Project Name	Owner's Contact Person	Design Engineer	Contract Date	Type of Work	Status	Cost of Work
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				

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NOT FOR BIDDING PURPOSES

SCHEDULE C - LIST OF MAJOR EQUIPMENT AVAILABLE

ITEM	PURCHASE DATE	CONDITION	ACQUIRED VALUE

NOT FOR VIEWING ONLY  
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# BID FORM

**RAWLS SPRINGS UTILITY DISTRICT  
WATER SYSTEM IMPROVEMENTS - 2020  
Contract Number 1 – Waterline and Tank Sites Improvements**

## TABLE OF CONTENTS

	<b>Page</b>
Article 1 – Bid Recipient.....	1
Article 2 – Bidder’s Acknowledgements .....	1
Article 3 – Bidder’s Representations.....	1
Article 4 – Bidder’s Certification .....	2
Article 5 – Basis of Bid (Bid Schedule).....	3
Article 6 – Time of Completion .....	7
Article 7 – Attachments to this Bid.....	7
Article 8 – Defined Terms.....	7
Article 9 – Bid Submittal.....	8

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**ARTICLE 1 – BID RECIPIENT**

1.01 This Bid is submitted to:

**Rawls Springs Utility District  
39 Archie Smith Road  
Hattiesburg, MS 39402**

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

**ARTICLE 2 – BIDDER’S ACKNOWLEDGEMENTS**

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

**ARTICLE 3 – BIDDER’S REPRESENTATIONS**

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

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

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work **and including all American Iron and Steel requirements.**

D. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder’s safety precautions and programs.

- E. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- F. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- G. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.
- H. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.
- I. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

#### **ARTICLE 4 – BIDDER’S CERTIFICATION**

4.01 Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
  - 1. “corrupt practice” means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;
  - 2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid 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.

**ARTICLE 5 – BASIS OF BID (BID SCHEDULE)**

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

**BASE BID**

Bid Item	Item Description	Quantity	Unit	Unit Price	Total Cost
<b>MISCELLANEOUS ITEMS</b>					
1	Mobilization	1	LS		
2	Project Sign	1	EA		
<b>Miscellaneous Subtotal</b>					
<b>TANK SITE NO. 1 - 39 Blackwell Boulevard</b>					
3	Demolition, Post Construction Cleanup and Grassing	1	LS		
4	Security Fence	1370	LF		
5	20' Wide Double Leaf Gate	1	EA		
6	16' Wide Double Leaf Gate	2	EA		
7	Piping modification and above ground master meter	1	LS		
8	Allowance to Coordinate with power company to replace overhead powerline w/ 3 phase underground powerline	1	LS	3000	3000
9	Pressure Transmitter Assembly	1	EA		
10	3 phase chlorinator pump and cable	1	LS		
11	Variable Frequency Drive (VFD) and Starter Panel with boxes and mounts	2	EA		
12	Well Pump Control Panel with NEMA 4 Enclosure	1	EA		
13	Control and power cables for VFDs, control system and pressure transmitter	1	LS		
<b>Tank Site No. 1 Subtotal</b>					
<b>TANK SITE NO. 2 - 506 Archie Smith Rd</b>					
14	Demolition, Post Construction Cleanup and Grassing	1	LS		
15	Security Fence	90	LF		
16	20' Wide Double Leaf Gate	2	EA		
17	24" RCP drain pipe	40	LF		
18	Aggregate driveway (limestone) on Archie Smith Road and fill eroded area	72	SY		
19	Aggregate driveway (limestone) on Stockyard Road	180	SY		
20	Earthwork for driveways and ditches	1	LS		
21	Pressure Transmitter Assembly	1	EA		
22	Variable Frequency Drive (VFD) and Starter Panel with boxes and mounts	2	EA		
23	Well Pump Control Panel with NEMA 4 Enclosure	1	EA		
24	Control and power cables for VFDs, control system and pressure transmitter	1	LS		
<b>Tank Site No. 2 Subtotal</b>					



Bid Item	Item Description	Quantity	Unit	Unit Price	Total Cost
<b>WATERLINE REPLACEMENT</b>					
25	4" PVC Water Main to Replace Existing AC Waterline	20,775	LF		
26	6" PVC Water Main to Replace Existing AC Waterline	7,385	LF		
27	4" Gate Valve Assembly	1	EA		
28	Blow Off Valve Assembly	4	EA		
29	Remove Existing Fire Hydrant and Appurtenances and Replace w/ New Fire Hydrant Assembly (Includes 6" Gate Valve)	5	EA		
30	Remove Existing Fire Hydrant and Appurtenances	3	EA		
31	Water Service Connection to Existing Meters (no meter box required)	160	EA		
32	Transfer Water Service Connection to Existing 8" pvc Waterline (no meter box required)	6	EA		
33	Additional Water Service Tubing if needed	600	LF		
34	Locate and Tie To Existing Water Valve	4	EA		
35	Locate and Tie To Existing Waterline (All Pipe Sizes)	18	EA		
36	Locate and Tie To Existing Waterline Using 4" Hot Tap Assembly	6	EA		
37	Locate and Tie To Existing Waterline Using 6" Hot Tap Assembly	4	EA		
38	Locate then Cut and Cap Existing Waterline	21	EA		
39	Open Cut Aggregate Driveway Repair	562	LF		
40	Open Cut Asphalt Driveway Repair	454	LF		
41	Directional Drill 4" HDPE Waterline	3630	LF		
42	Directional Drill 8" HDPE Casing with 4" HDPE Carrier Pipe	70	LF		
43	Directional Drill 6" HDPE Waterline	920	LF		
44	8" Steel Pipe Casing with 4" PVC Carrier Pipe (Open Cut)	275	LF		
45	8" Steel Pipe Casing with 4" PVC Carrier Pipe (Jack and Bore)	40	LF		
46	Slurry Fill Abandoned 4" AC waterline (Hwy 49)	14365	LF		
47	Slurry Fill Abandoned 6" AC waterline (Hwy 49)	960	LF		
48	Clearing and Grubbing	5	AC		
49	Offsite Select Material for Pipe Embedment and Haunching (field measured)	200	CY		
50	6" PVC Water Main @ Tank Site 3	20	LF		
51	Tie To Existing Waterline Using 6" Hot Tap Assembly @ Tank Site 3	2	EA		
<b>Waterline Replacement Subtotal</b>					

Bid Item	Item Description	Quantity	Unit	Unit Price	Total Cost
<b>BOOSTER STATION – Lott Town Road, Covington Co.</b>					
52	Locate and Tie To Existing Waterline Using 4" Hot Tap Assembly	2	EA		
53	4" Gate Valve Assembly	1	EA		
54	Clearing and Grubbing	0.2	AC		
55	Security Fence	216	LF		
56	16' Wide Double Leaf Gate	1	EA		
57	Aggregate driveway (limestone) on Lott Town Road	72	SY		
58	Earthwork for driveways and ditches	1	LS		
59	15" RCP drain pipe	24	LF		
60	Booster Station Controls	1	LS		
61	Duplex Booster Pump Unit, Enclosure and Foundation	1	LS		
62	4,000 gallon Hydropneumatic Tank and Controls	1	LS		
63	Concrete Foundation for Hydropneumatic Tank	1	LS		
64	3,200 gallon Collector Tank	1	LS		
65	Concrete Slab and Foundation for Collector Tank	1	LS		
66	Electrical Power, Power Pole and Site Lighting	1	LS		
<b>Booster Station Subtotal</b>					
<b>WATERLINE EXTENSION TO TICK CREEK</b>					
67	Locate and Tie To Existing Waterline Using 4" Hot Tap Assembly	1	EA		
68	4" PVC Waterline	15,250	LF		
69	Directional Drill 1 1/4" Service Tubing	120	LF		
70	Single Water Service Connection	8	EA		
71	Double Water Service Connection	5	EA		
72	Blow Off Valve Assembly	1	EA		
73	Open Cut Aggregate Driveway Repair	285	LF		
74	Open Cut Asphalt Driveway Repair	20	LF		
75	Offsite Select Material for Pipe Embedment and Haunching (field measured)	40	CY		
<b>Waterline Extension to Tick Creek Subtotal</b>					

**TOTAL BASE BID**

*(Written Format):*

\$ \_\_\_\_\_

(Number Format): (\$ \_\_\_\_\_ )

**ADDITIVE ALTERNATE NO. 1 – SCADA SYSTEM**

Bid Item	Item Description	Quantity	Unit	Unit Price	Total Cost
A1-1	RTU/SCADA Control Panel, Enclosure, Mounts, Sensors, Digital Encoders, and all necessary wiring	3	LS		
A1-2	CTU Control Panel, Enclosure, Mount, all necessary wiring, Computer and associated Equipment	1	LS		
A1-3	Solar Panel and Pressure Transmitter assembly for Tank Site 3	1	LS		
<b>Additive Alternate No. 1 Subtotal</b>					

**TOTAL ADDITIVE ALTERNATE NO. 1 BID**

*(Written Format):*

\$ \_\_\_\_\_

(Number Format): (\$ \_\_\_\_\_ )

**ADDITIVE ALTERNATE NO. 2 – SLURRY FILL ABANDONED PIPES ON COUNTY ROAD**

Bid Item	Item Description	Quantity	Unit	Unit Price	Total Cost
A2-1	Slurry Fill Abandoned 4" AC waterline (County Roads)	9790	LF		
A2-2	Slurry Fill Abandoned 6" AC waterline (County Roads)	9250	LF		
<b>Additive Alternate No. 2 Subtotal</b>					

**TOTAL ADDITIVE ALTERNATE NO. 2 BID**

*(Written Format):*

\$ \_\_\_\_\_

(Number Format): (\$ \_\_\_\_\_ )

**TOTAL BASE BID PLUS ADDITIVE ALTERNATE NO. 1 & NO. 2 BID**

*(Written Format):*

\$ \_\_\_\_\_

(Number Format): (\$ \_\_\_\_\_ )

Bidder acknowledges that (1) each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and (2) estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

#### **ARTICLE 6 – TIME OF COMPLETION**

- 6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.
- 6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

#### **ARTICLE 7 – ATTACHMENTS TO THIS BID**

- 7.01 The following documents are submitted with and made a condition of this Bid:
- A. Required Bid security;
  - B. List of Project References;
  - C. Required Bidder Qualification Statement with supporting data;
  - D. If Bid amount exceeds \$10,000, signed Compliance Statement (RD 400-6). Refer to specific equal opportunity requirements set forth in the Supplemental General Conditions;
  - E. If Bid amount exceeds \$25,000, signed Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – Lower Tier Covered Transactions (AD-1048);
  - F. If Bid amount exceeds \$100,000, signed RD Instruction 1940-Q, Exhibit A-1, Certification for Contracts, Grants, and Loans.
  - G. Manufacturer's Certification letter of compliance with Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A – Agriculture, Rural Development, Food and Drug Administration) and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference for all equals or substitutes approved by Addenda for American Iron and Steel products as provided in these Contract Documents.

#### **ARTICLE 8 – DEFINED TERMS**

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

**ARTICLE 9 – BID SUBMITTAL**

BIDDER: *[Indicate correct name of bidding entity]*

\_\_\_\_\_  
By:  
*[Signature]* \_\_\_\_\_

*[Printed name]* \_\_\_\_\_  
*(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)*

Attest:  
*[Signature]* \_\_\_\_\_

*[Printed name]* \_\_\_\_\_

Title: \_\_\_\_\_

Submittal Date: \_\_\_\_\_

Address for giving notices:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Telephone Number: \_\_\_\_\_

Fax Number: \_\_\_\_\_

Contact Name and e-mail address: \_\_\_\_\_  
\_\_\_\_\_

Bidder's License No.: \_\_\_\_\_  
*(where applicable)*

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NOT FOR BIDDING PURPOSES

## BID BOND

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

BIDDER (*Name and Address*):

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

OWNER (*Name and Address*):

BID

Bid Due Date:

Description : Rawls Springs Utility District Water System Improvements – 2020  
Contract Number 1 – Waterline and Tank Sites Improvements

BOND

Bond Number:

Date:

Penal sum

\$

(Words)

(Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

**BIDDER**

**SURETY**

(Seal)

(Seal)

Bidder's Name and Corporate Seal

Surety's Name and Corporate Seal

By:

Signature

By:

Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest:

Signature

Attest:

Signature

Title

Title

*Note: Addresses are to be used for giving any required notice.*

*Provide execution by any additional parties, such as joint venturers, if necessary.*

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

## NOTICE OF AWARD

---

Date of Issuance:

Owner:	Rawls Springs Utility District	Owner's Contract No.:	N/A
Engineer:	W Engineering, PA	Engineer's Project No.:	1802
Project:	Rawls Springs Utility District Water System Improvements - 2020	Contract Name:	Contract Number 1 – Waterline and Tank Sites Improvements

Bidder:

Bidder's Address:

### TO BIDDER:

You are notified that Owner has accepted your Bid dated [ \_\_\_\_\_ ] for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

Rawls Springs Utility District Water System Improvements – 2020  
Contract Number 1 – Waterline and Tank Sites Improvements

The Contract Price of the awarded Contract is: \$ \_\_\_\_\_

**Four (4)** unexecuted counterparts of the Agreement accompany this Notice of Award, along with a copy of your proposal.

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 all four (4) of these attached counterparts of the Agreement in their entirety, fully executed by Bidder.
2. Deliver with the executed Agreement(s) the Contract security [*e.g., performance and payment bonds*] and insurance documentation as specified in the Instructions to Bidders and General Conditions, Articles 2 and 6.
3. Other conditions precedent: Inspect the cancellation clause of all insurance and surety paperwork to ensure that they do not only “endeavor” to notify parties of cancelations, but will notify the Owner or Engineer of any cancellation.

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

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

---

Owner: **Rawls Springs Utility District**

By: \_\_\_\_\_  
Ray Anthony “Tony” Muli – President

Copy: Engineer – W Engineering



**B. CONTRACT FORMS**

FOR VIEWING ONLY  
NOT FOR BIDDING PURPOSES

AGREEMENT  
BETWEEN OWNER AND CONTRACTOR  
FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

THIS AGREEMENT is by and between Rawls Springs Utility District (“Owner”) and  
\_\_\_\_\_ (“Contractor”).

Owner and Contractor hereby agree as follows:

**ARTICLE 1 – WORK**

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

*Constructing water mains, chlorination equipment, fluoridation equipment, master water meters, variable frequency drives for wells, SCADA system, electrical improvements, water level controls, access drive, chain link fencing and other improvements.*

**ARTICLE 2 – THE PROJECT**

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: **Rawls Springs Utility District  
Water System Improvement – 2020,  
Contract Number 1 – Waterline and Tank Sites Improvements**

**ARTICLE 3 – ENGINEER**

3.01 The part of the Project that pertains to the Work has been designed by W Engineering, P.A.  
3.02 The Owner has retained W Engineering, P.A. (“Engineer”) to act as Owner’s representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

**ARTICLE 4 – CONTRACT TIMES**

4.01 *Time of the Essence*  
A. The time limit for 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: Days*  
A. The Work will be substantially completed within **180 calendar days** after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **210 calendar days** after the date when the Contract Times commence to run.

#### 4.03 *Liquidated Damages*

- A. Contractor and Owner recognize that time is of the essence 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 times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):
1. Substantial Completion: Contractor shall pay Owner **\$300.00 for each calendar day** that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for Substantial Completion until the Work is substantially complete.
  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 **\$500.00 for each calendar day** that expires after such time until the Work is completed and ready for final payment.
  3. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.
- B. *Bonus*: There are no bonuses for early completion in this project.

---

#### ARTICLE 5 – 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, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

#### ARTICLE 6 – PAYMENT PROCEDURES

##### 6.01 *Submittal and Processing of Payments*

- A. Contractor shall submit Applications for Payment in accordance with Article 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 account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 20th 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 Work completed (with the balance being retainage); ~~if the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, 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 ~~of the entire construction to be provided under the Contract Documents,~~ 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 in accordance with Paragraph 15.06 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 15.06.

### ARTICLE 7 – INTEREST

7.01 All amounts not paid when due shall bear interest at the rate of 6% percent per annum.

### ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

- 8.01 In order to induce Owner to enter into this Contract, Contractor makes the following representations:
- A. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.
  - B. Contractor has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
  - C. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
  - D. Contractor is encouraged to examine the project site to evaluate conditions that could impact construction. Permission to dig test holes in specific locations shall be granted after Contractor notifies the Engineer and Mississippi One Call. Contractor shall restore all test hole locations by neatly backfilling, fertilizing, seeding and mulching.
  - E. 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 drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (3) Contractor's safety precautions and programs.

- F. 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.
- G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
- J. 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.

## ARTICLE 9 – CONTRACT DOCUMENTS

### 9.01 *Contents*

- A. The Contract Documents consist of the following:
  - 1. This Agreement (pages 1 to 7, inclusive).
  - 2. Performance bond (pages 1 to 3, inclusive).
  - 3. Payment bond (pages 1 to 3, inclusive).
  - 4. Other bonds: None
  - 5. General Conditions (pages 1 to 65, inclusive).
  - 6. Supplementary Conditions (pages 1 to 18, inclusive).
  - 7. Specifications as listed in the table of contents of the Project Manual.
  - 8. Drawings (not attached but incorporated by reference) consisting of 16 sheets with each sheet bearing the following general title:  
**Rawls Springs Utility District  
Water System Improvements – 2020  
Contract Number 1 – Waterline and Tank Sites Improvements**
  - 9. Addenda (numbers  to , inclusive).
  - 10. Exhibits to this Agreement (enumerated as follows):
    - a. Contractor's Bid (pages 1 to 7, inclusive).
  - 11. 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.

- B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 9.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

## **ARTICLE 10 – MISCELLANEOUS**

### **10.01 Terms**

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

### **10.02 Assignment of Contract**

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, 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 Documents.

### **10.03 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.

### **10.04 Severability**

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

### **10.05 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 10.05:
  - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing 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.

10.06 *Other Provisions*

- A. Owner stipulates that if the General Conditions that are made a part of this Contract are based on EJCDC® C-700, Standard General Conditions for the Construction Contract, 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.

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

This Agreement will be effective on \_\_\_\_\_ (which is the Effective Date of the Contract).

OWNER:

CONTRACTOR:

\_\_\_\_\_

\_\_\_\_\_

By: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Title: \_\_\_\_\_

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

Attest: \_\_\_\_\_

Attest: \_\_\_\_\_

Title: \_\_\_\_\_

Title: \_\_\_\_\_

Address for giving notices:

Address for giving notices:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

License No.: \_\_\_\_\_

*(where applicable)*

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

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# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

## TABLE OF CONTENTS

	<b>Page</b>
Article 1 – Definitions and Terminology .....	1
1.01 Defined Terms .....	1
1.02 Terminology .....	5
Article 2 – Preliminary Matters .....	6
2.01 Delivery of Bonds and Evidence of Insurance .....	6
2.02 Copies of Documents .....	6
2.03 Before Starting Construction .....	6
2.04 Preconstruction Conference; Designation of Authorized Representatives .....	7
2.05 Initial Acceptance of Schedules .....	7
2.06 Electronic Transmittals .....	7
Article 3 – Documents: Intent, Requirements, Reuse .....	8
3.01 Intent .....	8
3.02 Reference Standards .....	8
3.03 Reporting and Resolving Discrepancies .....	8
3.04 Requirements of the Contract Documents .....	9
3.05 Reuse of Documents .....	10
Article 4 – Commencement and Progress of the Work .....	10
4.01 Commencement of Contract Times; Notice to Proceed .....	10
4.02 Starting the Work .....	10
4.03 Reference Points .....	10
4.04 Progress Schedule .....	10
4.05 Delays in Contractor’s Progress .....	11
Article 5 – Availability of Lands; Subsurface and Physical Conditions; Hazardous Environmental Conditions .....	12
5.01 Availability of Lands .....	12
5.02 Use of Site and Other Areas .....	12
5.03 Subsurface and Physical Conditions .....	13
5.04 Differing Subsurface or Physical Conditions .....	14
5.05 Underground Facilities .....	15

5.06	Hazardous Environmental Conditions at Site .....	17
Article 6 – Bonds and Insurance .....		19
6.01	Performance, Payment, and Other Bonds .....	19
6.02	Insurance—General Provisions .....	19
6.03	Contractor’s Insurance .....	20
6.04	Owner’s Liability Insurance .....	23
6.05	Property Insurance .....	23
6.06	Waiver of Rights .....	25
6.07	Receipt and Application of Property Insurance Proceeds .....	25
Article 7 – Contractor’s Responsibilities .....		26
7.01	Supervision and Superintendence .....	26
7.02	Labor; Working Hours .....	26
7.03	Services, Materials, and Equipment .....	26
7.04	“Or Equals” .....	27
7.05	Substitutes .....	28
7.06	Concerning Subcontractors, Suppliers, and Others .....	29
7.07	Patent Fees and Royalties .....	31
7.08	Permits .....	31
7.09	Taxes .....	32
7.10	Laws and Regulations .....	32
7.11	Record Documents .....	32
7.12	Safety and Protection .....	32
7.13	Safety Representative .....	33
7.14	Hazard Communication Programs .....	33
7.15	Emergencies .....	34
7.16	Shop Drawings, Samples, and Other Submittals .....	34
7.17	Contractor’s General Warranty and Guarantee .....	36
7.18	Indemnification .....	37
7.19	Delegation of Professional Design Services .....	37
Article 8 – Other Work at the Site .....		38
8.01	Other Work .....	38
8.02	Coordination .....	39
8.03	Legal Relationships .....	39

Article 9 – Owner’s Responsibilities.....	40
9.01 Communications to Contractor.....	40
9.02 Replacement of Engineer .....	40
9.03 Furnish Data .....	40
9.04 Pay When Due.....	40
9.05 Lands and Easements; Reports, Tests, and Drawings .....	40
9.06 Insurance .....	40
9.07 Change Orders.....	40
9.08 Inspections, Tests, and Approvals.....	41
9.09 Limitations on Owner’s Responsibilities .....	41
9.10 Undisclosed Hazardous Environmental Condition.....	41
9.11 Evidence of Financial Arrangements.....	41
9.12 Safety Programs .....	41
Article 10 – Engineer’s Status During Construction.....	41
10.01 Owner’s Representative.....	41
10.02 Visits to Site.....	41
10.03 Project Representative.....	42
10.04 Rejecting Defective Work.....	42
10.05 Shop Drawings, Change Orders and Payments.....	42
10.06 Determinations for Unit Price Work .....	42
10.07 Decisions on Requirements of Contract Documents and Acceptability of Work .....	42
10.08 Limitations on Engineer’s Authority and Responsibilities.....	42
10.09 Compliance with Safety Program.....	43
Article 11 – Amending the Contract Documents; Changes in the Work .....	43
11.01 Amending and Supplementing Contract Documents .....	43
11.02 Owner-Authorized Changes in the Work .....	44
11.03 Unauthorized Changes in the Work .....	44
11.04 Change of Contract Price .....	44
11.05 Change of Contract Times .....	45
11.06 Change Proposals .....	45
11.07 Execution of Change Orders.....	46
11.08 Notification to Surety.....	47
Article 12 – Claims.....	47

12.01	Claims .....	47
Article 13 – Cost of the Work; Allowances; Unit Price Work.....		48
13.01	Cost of the Work .....	48
13.02	Allowances .....	50
13.03	Unit Price Work .....	51
Article 14 – Tests and Inspections; Correction, Removal or Acceptance of Defective Work.....		52
14.01	Access to Work.....	52
14.02	Tests, Inspections, and Approvals.....	52
14.03	Defective Work.....	53
14.04	Acceptance of Defective Work.....	53
14.05	Uncovering Work .....	53
14.06	Owner May Stop the Work .....	54
14.07	Owner May Correct Defective Work.....	54
Article 15 – Payments to Contractor; Set-Offs; Completion; Correction Period.....		55
15.01	Progress Payments.....	55
15.02	Contractor’s Warranty of Title .....	58
15.03	Substantial Completion.....	58
15.04	Partial Use or Occupancy .....	59
15.05	Final Inspection .....	59
15.06	Final Payment.....	59
15.07	Waiver of Claims .....	61
15.08	Correction Period.....	61
Article 16 – Suspension of Work and Termination.....		62
16.01	Owner May Suspend Work .....	62
16.02	Owner May Terminate for Cause.....	62
16.03	Owner May Terminate For Convenience .....	63
16.04	Contractor May Stop Work or Terminate .....	63
Article 17 – Final Resolution of Disputes .....		64
17.01	Methods and Procedures.....	64
Article 18 – Miscellaneous .....		64
18.01	Giving Notice .....	64
18.02	Computation of Times.....	64
18.03	Cumulative Remedies .....	64

18.04 Limitation of Damages ..... 65  
18.05 No Waiver ..... 65  
18.06 Survival of Obligations ..... 65  
18.07 Controlling Law ..... 65  
18.08 Headings..... 65

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## 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 form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
  4. *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, or both; 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, or both; 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; or (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. 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), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. (“CERCLA”); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5101 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. (“RCRA”); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree 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 the 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. *Engineer*—The individual or entity named as such in the Agreement.
21. *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.
22. *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. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.
23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
25. *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.
26. *Notice of Award*—The written notice by Owner to a Bidder of Owner’s acceptance of the Bid.
27. *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.
28. *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.
29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor’s plan to accomplish the Work within the Contract Times.
30. *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.
31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or “RPR” includes any assistants or field staff of Resident Project Representative.
33. *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.
34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals and the performance of related construction activities.
35. *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.
36. *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.



37. *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 furnished by Owner which are designated for the use of Contractor.
38. *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.
39. *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.
40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
47. *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.

48. *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 the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:*
1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the 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:*
1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:*
1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
    - a. does not conform to the Contract Documents; or
    - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
    - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).
- E. *Furnish, Install, Perform, Provide:*
1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
  2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

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

- A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner’s Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), 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 executed 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 specifically 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 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
  1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
  2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
  3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

#### 2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items 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 items, or from those established in applicable transmittal protocols.

### ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

#### 3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall 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.

#### 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, shall mean 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, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, 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 Documents 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 Documents 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 shall 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 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 thereunder.
- 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 give written notice to Owner and Contractor 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 editions, 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 shall preclude 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 thirtieth 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 sixtieth day after the day of Bid opening or the thirtieth 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 shall 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 shall 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 shall 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 the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- 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. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall 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 utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
  4. acts of war or terrorism.
- D. 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.
- E. Paragraph 8.03 governs 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.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times 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.



- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

## **ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS**

### **5.01 Availability of Lands**

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
- 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; 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 7.12, 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 at law; 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 shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site 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 known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
  - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); 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 upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. 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; or
  - 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
  - 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

#### 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 either:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
  2. is of such a nature as to require a change in the Drawings or Specifications; or
  3. differs materially from that shown or indicated in the Contract Documents; or
  4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 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 the necessity of Owner's obtaining 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 above; 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. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, 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 conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
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; or
  - 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 as 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, or both, then any such adjustment shall 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, or both, 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.

#### 5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
  1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
  2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
    - a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
    - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
    - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
    - d. 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 in the Contract Documents, or was not shown or indicated 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), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; 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 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. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, 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. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
    - 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;
    - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
    - d. 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, or both, then any such adjustment shall 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, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

- A. *Reports and Drawings*: The Supplementary Conditions identify:
1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
  2. 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 Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. 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; or
  2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
  3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for 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, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, 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.
- 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 or 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 shall obligate 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 shall obligate 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 all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.
- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, 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 shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.
- E. 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.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

### 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. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is



maintaining the policies, coverages, and endorsements 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 and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements 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 and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. 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, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of 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.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect 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 shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

### 6.03 *Contractor's Insurance*

- A. *Workers' Compensation:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
  - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
  - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
  - 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).

4. Foreign voluntary worker compensation (if applicable).
- B. *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:
1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
  2. claims for damages insured by reasonably available personal injury liability coverage.
  3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- C. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage:
    - a. Such insurance shall 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, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
  3. Broad form property damage coverage.
  4. Severability of interest.
  5. Underground, explosion, and collapse coverage.
  6. Personal injury coverage.
  7. 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); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
  8. 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.
- D. *Automobile liability:* Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.
- E. *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. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.
- F. *Contractor's pollution liability insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result

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

- G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *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 shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.
- I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:
1. include at least the specific coverages provided in this Article.
  2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
  3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
  4. remain in effect at least until final payment (and longer if expressly required in this Article) 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 Documents.
  5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.
- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

#### 6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.
- B. 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.

#### 6.05 *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 full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
  - 1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
  - 2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.
  - 3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
  - 4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).

5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
  6. extend to cover damage or loss to insured property while in transit.
  7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
  8. allow for the waiver of the insurer's subrogation rights, as set forth below.
  9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
  10. not include a co-insurance clause.
  11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
  12. include performance/hot testing and start-up.
  13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed 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.
- C. *Deductibles:* The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- 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 notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance:* 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 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

## 6.06 *Waiver of Rights*

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. 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 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 Subcontractors, all individuals or entities identified in the Supplementary Conditions as 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. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. 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:
  - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
  - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial 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.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work 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 any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

## 6.07 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 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 6.05 shall 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, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

## **ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES**

### **7.01 *Supervision and Superintendence***

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

### **7.02 *Labor; Working Hours***

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, 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.

### **7.03 *Services, Materials, and Equipment***

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and

guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

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

#### 7.04 "Or Equals"

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the 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 material or equipment, or items from other proposed suppliers under the circumstances described below.
  - 1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:
    - a. in the exercise of reasonable judgment Engineer determines that:
      - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
      - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
      - 3) it has a proven record of performance and availability of responsive service; and
      - 4) it is not objectionable to Owner.
    - b. Contractor certifies that, if approved and incorporated into the Work:
      - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
      - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
- 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 shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

#### 7.05 *Substitutes*

- A. Unless the specification or description of an item of material or equipment 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 material or equipment under the circumstances described below. To the extent possible such requests shall 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 material or equipment from anyone other than Contractor.
  - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.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 material or equipment that Contractor seeks to furnish or use. The application:
    - a. shall 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 that specified, and
      - 3) be suited to the same use as that 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 that specified, and

- 2) available engineering, sales, maintenance, repair, and replacement services.
- d. shall 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 shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

#### 7.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities 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, Supplier, or other individual or entity 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 five days.

- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. 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, Suppliers, or other individuals or entities 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, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, 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, Supplier, or other individual or entity, whether initially or as a replacement, shall 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 fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

O. Nothing in the Contract Documents:

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

7.07 *Patent Fees and Royalties*

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

7.08 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of 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

#### 7.09 *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.

#### 7.10 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work 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 shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give 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 notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

#### 7.11 *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.

#### 7.12 *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. 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.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when 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.
  - C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
  - D. 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.
  - E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor 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).
  - F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
  - G. Contractor's duties and responsibilities for safety and protection shall 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.

#### 7.13 *Safety Representative*

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

#### 7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or

exchanged between or among employers at the Site in accordance with Laws or Regulations.

#### 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 threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

#### 7.16 *Shop Drawings, Samples, and Other Submittals*

##### A. *Shop Drawing and Sample Submittal Requirements:*

1. Before submitting a Shop Drawing or Sample, Contractor shall have:
  - a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
  - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
  - c. determined and verified 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
  - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.
3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

##### 1. *Shop Drawings:*

- a. Contractor shall submit the number of copies required in the Specifications.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to

provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

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.D.
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. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.
- D. *Engineer's Review:*
  1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
  2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction 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 shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 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.
  5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 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, shall 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, Sample, or other submittal shall 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.D.4.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.
2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

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 and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
  1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
  2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
  1. observations by Engineer;
  2. recommendation by Engineer or payment by Owner of any progress or final payment;
  3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
  4. use or occupancy of the Work or any part thereof by Owner;
  5. any review and approval of a Shop Drawing or Sample submittal;
  6. the issuance of a notice of acceptability by Engineer;
  7. any inspection, test, or approval by others; or
  8. any correction of defective Work by Owner.

- D. 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 shall 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 and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer or any of their 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 shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
  - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
  - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

#### 7.19 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
- B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop

Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

## **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 utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. 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.
- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, 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.

## 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 at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner for whom the Owner is responsible 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, or both. 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 shall 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. When applicable, any such equitable adjustment in Contract Price shall 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 is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- 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. 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 to 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.
- C. 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 to Contractor.

- D. 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 shall 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 Documents (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 10.08. 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 *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 Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

- A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.
- C. Engineer's authority as to Change Orders is set forth in Article 11.
- D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *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.

10.07 *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.

10.08 *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, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 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 10.08 shall also apply to the Resident Project Representative, if any.

#### 10.09 *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 (if any) of which Engineer has been informed.

### **ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK**

#### 11.01 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
  - 1. *Change Orders:*
    - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
    - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not 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, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
  - 2. *Work Change Directives:* 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 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an



adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: 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. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

#### 11.02 *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. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes 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 shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate 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.

#### 11.03 *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.

#### 11.04 *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 shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall 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); or
  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 11.04.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 11.04.C).

- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
  2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
    - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
    - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
    - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.04.C.2.a and 11.04.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.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 five 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 shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
    - d. no fee shall 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 will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
    - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

#### 11.05 *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 shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

#### 11.06 *Change Proposals*

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under

the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. 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. The supporting data shall 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. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.
  2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall 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.
  3. *Binding Decision:* Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *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 that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

#### 11.07 Execution of Change Orders

- A. Owner and Contractor shall execute appropriate Change Orders covering:
1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
  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 11.02, (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 in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

#### 11.08 *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 shall be submitted 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; and
  - 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.
- 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 shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, 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 shall 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 shall 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 shall 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 shall 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 shall 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 shall 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 shall be incorporated in a Change Order 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. 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 shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall 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. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable

thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
  - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
  - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
  - c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
  - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, 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 property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes

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

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as 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 shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 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. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*: When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

### 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 on account of any of the foregoing will be valid.
- C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

### 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, subject to the provisions of the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
  - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
  - 2. there is no corresponding adjustment with respect to any other item of Work; and
  - 3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.



## ARTICLE 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 will 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 therewith 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 shall 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 shall 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 shall 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 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 shall 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, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, 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 shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

#### 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 rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 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 on account of 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. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
  2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
  3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.
- 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, or
    - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
    - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
    - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
    - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
  5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 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 on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of 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 that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
  - j. liquidated 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;
  - l. there are other items entitling 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 shall 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 shall be treated as an amount due as determined by Paragraph 15.01.C.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 seven 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 shall 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 seven 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 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 6.05 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 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall 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 disputes that Contractor believes are unsettled; 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 Application and Acceptance:***

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall 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. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. 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. *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.

**D. *Payment Becomes Due:*** Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation,

including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

#### 15.07 *Waiver of Claims*

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
- 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 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 terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then 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 other adjacent areas;
  - 2. correct such defective Work;
  - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
  - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not 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, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall 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) ten 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) 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 seven 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 shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

#### 16.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
  - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
  - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; 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 on account of loss of anticipated overhead, profits, or revenue, 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 seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 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, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph 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; and
  2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising 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; or
  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 Documents requires the giving of written notice, it will be deemed to have been validly given if:
1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
  2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

### **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 shall not constitute a waiver of that provision, nor shall 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 or completion of the Contract or termination 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 *Headings*

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

FOR VIEWING ONLY  
NOT FOR BIDDING PURPOSES

## SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC® C-700 (2013 Edition). All provisions that are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

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 thereto.

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### USER MODIFICATIONS

These supplementary conditions are being used as directed by the EJCDC guidance. Various options have been selected in accordance with EJCDC instructions. Also, the following information has been added as clearly marked by color coding.

Blue print shows information added from RUS Bulletin 1780-26 (9-7-2017 Version).

Red print shows information added from RUS Bulletin 1780-35. (8-30-2017 Version)

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### ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC-1.01.A.8 Add the following language at the end of the last sentence of Paragraph 1.01.A.8:

**The Change Order form to be used on this Project is EJCDC C-941. Agency approval is required before Change Orders are effective.**

SC 1.01.A.48 Add the following language at the end of the last sentence of Paragraph 1.01.A.48:

**A Work Change Directive cannot change Contract Price or Contract Times without a subsequent Change Order.**

SC 1.01.A.49 Add the following new Paragraph after Paragraph 1.01.A.48:

**Abnormal Weather Conditions – Conditions of extreme or unusual weather for a given region, elevation, or season as determined by Engineer. Extreme or unusual weather that is typical for a given region, elevation, or season should not be considered Abnormal Weather Conditions.**

SC-1.01.A.50 Add the following new Paragraph after Paragraph 1.01.A.49

**Agency - The Project is financed in whole or in part by USDA Rural Utilities Service pursuant to the Consolidated Farm and Rural Development Act (7 USC Section 1921 et seq.). The Rural Utilities Service programs are administered through the USDA Rural Development offices; therefore, the Agency for these documents is USDA Rural Development.**

SC-1.01.A.51 Add 1.01.A.51 after 1.01.A.50 (as amended by RUS 1780-26)

**“Manufacturer’s Certification letter is documentation provided by the manufacturer, supplier, distributor, vendor, fabricator, etc. to various entities stating that the American Iron and Steel products to be used in the project are produced in the United States in accordance with American Iron and Steel requirements. Refer to Manufacturer’s Certification Letter provided in these Contract Documents.”**

SC-1.01.A.52 Add 1.01.A.52 after 1.01.A.51

**Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference. The term “iron and steel products” means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials.”**

## **ARTICLE 2 – PRELIMINARY MATTERS**

SC-2.02 *Copies of Documents.*

SC-2.02.A. Amend the first sentence of Paragraph 2.02.A. to read as follows:

**Owner shall furnish to Contractor **five** copies of the Contract Documents (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF).**

SC- 2.06.B Delete Paragraph 2.06.B and replace it with the term [Deleted].

## **ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK**

SC 4.01.A Amend the last sentence of Paragraph 4.01.A by striking out the following words:

**In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.**

SC 4.05.C.2 Amend Paragraph 4.05.C.2 by striking out the following text: “abnormal weather conditions;” and inserting the following text:

**Abnormal Weather Conditions;**

## **ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS**

SC-5.03 *Subsurface and Physical Conditions*

**SC 5.03 Delete Paragraphs 5.03.A and 5.03.B in their entirety and insert the following:**

- A. No reports of explorations or tests of subsurface conditions at or adjacent to the Site, or drawings of physical conditions relating to existing surface or subsurface structures at the Site, are known to Owner.**

SC-5.06 *Hazardous Environmental Conditions*

**SC 5.06 Delete Paragraphs 5.06.A and 5.06.B in their entirety and insert the following:**

- A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner.**
- B. Not Used.**



## ARTICLE 6 – BONDS AND INSURANCE

### SC-6.02 Insurance—General Provisions

#### SC-6.02 Add the following paragraph immediately after Paragraph 6.02.B:

1. Contractor may obtain worker's compensation insurance from an insurance company that has not been rated by A.M. Best, provided that such company (a) is domiciled in the state in which the project is located, (b) is certified or authorized as a worker's compensation insurance provider by the appropriate state agency, and (c) has been accepted to provide worker's compensation insurance for similar projects by the state within the last 12 months.

### SC-6.03 Contractor's Insurance

#### SC 6.03 Add the following new paragraph immediately after Paragraph 6.03.J:

**K.** The Contractor shall submit to the Owner a certificate(s) of insurance evidencing Bodily Injury and Property Damage Liability coverage for claims arising out of all premises operations, subcontracted operations, products-completed operations, and all liability assumed by the Contractor under any contract or agreement including but not limited to Article 5 of this agreement. Such insurance shall be in the name of the CONTRACTOR with the ENGINEER and the OWNER named as additional insureds in compliance with requirements set out in Par. 6.30 - 6.32 for Indemnification and with insurers acceptable to the Owner. The minimum limits for such insurance shall be:

Bodily Injury	\$500,000	Each Occurrence
	\$1,000,000	Aggregate
Property Damage	\$500,000	Each Occurrence
	\$1,000,000	Aggregate

The Contractor shall submit to the Owner a certificate of insurance evidencing Comprehensive Automobile Liability coverage for claims arising out of the ownership, maintenance, or use of owned, hired, or non-owned automobiles. Such insurance shall be in the name of the Contractor and with insurer acceptable to the Owner.

The minimum limits for such insurance shall be:

Bodily Injury	\$250,000	Each Person
Property Damage	\$500,000	Each Occurrence

#### SC 6.05.A Builder's Risk – Delete in its entirety and replace with the following:

Until the work is completed and accepted by the Owner as evidenced in writing, it shall be under the charge and care of the Contractor. He shall take every necessary precaution against injury or damage to any part thereof by action of the elements or from any cause, whether arising from the execution of the work. Unless otherwise provided in these specifications, the Contractor shall rebuild, repair, restore, and make good, without extra compensation, all injuries, or damages to any portion of the work occasioned by any of the above causes before its completion and acceptance.

## ARTICLE 7 – CONTRACTOR’S RESPONSIBILITIES

SC-7.03 **Add sentence 7.03.d:** “All iron and steel products must meet American Iron and Steel requirements.”

SC 7.04.A Amend the third sentence of Paragraph 7.04.A by striking out the following words:

**Unless the specification or description contains or is followed by words reading that no like, equivalent, or ‘or-equal’ item is permitted.**

SC 7.04.A.1 Amend the last sentence of Paragraph a.3 by striking out “**and;**” and adding a period at the end of Paragraph a.3.

SC 7.04.A.1 Delete paragraph 7.04.A.1.a.4 in its entirety and insert the following in its place:

**[Deleted]**

SC 7.06.A Amend Paragraph 7.06.A by adding the following text to the end of the Paragraph:

**The Contractor shall not award work valued at more than fifty percent of the Contract Price to Subcontractor(s), without prior written approval of the Owner.**

SC 7.06.B Delete paragraph 7.06.B in its entirety and insert the following in its place:

**[Deleted]**

SC 7.04.B.1 Add 7.04.B.1:

“Contractor shall include a Manufacturer’s Certification letter for compliance with American Iron and Steel requirements in support data, if applicable. Refer to Manufacturer’s Certification Letter provided in these Contract Documents. In addition, for the Deminimis Waiver, Contractor shall maintain an itemized list of incidental components and ensure that the cost is less than 5% of total materials cost for project; for the Minor Components Waiver, the Contractor shall maintain a list of products to which the minor components waiver applies and the cost of the non-domestically produced component is less than 5% of total materials cost of that product.”

SC 7.05.A.3.a.4 Add 7.05.A.3.a.4:

comply with American Iron and Steel by providing Manufacturer’s Certification letter of American Iron and Steel compliance, if applicable. Refer to Manufacturer’s Certification Letter provided in these Contract Documents.”

SC 7.06.E Amend the second sentence of Paragraph 7.06.E by striking out

“**Owner may also require Contractor to retain specific replacements; provided, however, that**”.

SC 7.11.A Modify 7.11.A by inserting the following after “written *interpretations and clarifications*.”:

“Manufacturers’ Certification letter is documentation provided by the manufacturer, supplier, distributor, vendor, fabricator, etc. to various entities stating that the iron and steel products to be used in the project are produced in the United States in accordance with American Iron and Steel Requirements. Refer to Manufacturer’s Certification Letter provided in these Contract Documents.”

SC 7.16.A.1.e **Add 7.16.A.1.e**

“e. obtained Manufacturer’s Certification letter for any item in the submittal subject to American Iron and Steel requirements and include the Certificate in the submittal. Refer to Manufacturer’s Certification Letter provided in these Contract Documents.”

SC 7.16.D.9 Add 7.16.D.9

“Engineer’s review and approval of Shop Drawing or Sample shall include review of compliance with American Iron and Steel requirements, as applicable.”

SC 7.17.E Add 7.17.E

“Contractor shall certify upon Substantial Completion that all Work and Materials has complied with American Iron and Steel requirements as mandated by Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference. Contractor shall provide said Certification to Owner. Refer to General Contractor’s Certification Letter provided in these Contract Documents.”

**ARTICLE 10 – ENGINEER’S STATUS DURING CONSTRUCTION**

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

- B. The Resident Project Representative (RPR) will be Engineer's representative at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions.**
- 1. General: RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of Contractor. RPR shall generally communicate with Owner only with the knowledge of and under the direction of Engineer.**
  - 2. Schedules: Review the progress schedule, schedule of Shop Drawing and Sample submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.**
  - 3. Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings, and prepare and circulate copies of minutes thereof.**
  - 4. 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 proper execution of the Work.**
  - 5. Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.**
  - 6. Shop Drawings and Samples:**
    - a. Record date of receipt of Samples and Contractor-approved Shop Drawings.**

- b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.
  - c. Advise Engineer and Contractor of the commencement of any portion of the Work requiring a Shop Drawing or Sample submittal for which RPR believes that the submittal has not been approved by Engineer.
- 7. **Modifications:** Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, if any, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.
- 8. **Review of Work and Rejection of Defective Work:**
  - a. Conduct on-Site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.
  - b. Report to Engineer whenever RPR believes that any part of Contractor's work in progress is defective, will not produce a completed Project that conforms generally to the Contract Documents, or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of work in progress that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
- 9. **Inspections, Tests, and System Start-ups:**
  - a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.
  - b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.
- 10. **Records:**
  - a. Prepare a daily report or keep a diary or log book, recording Contractor's hours on the Site, Subcontractors present at the Site, weather conditions, data relative to questions of Change Orders, Field Orders, Work Change Directives, or changed conditions, Site visitors, deliveries of equipment or materials, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to Engineer.
  - b. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.
  - c. Maintain records for use in preparing Project documentation.

**11. Reports:**

- a. **Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the Progress Schedule and schedule of Shop Drawing and Sample submittals.**
- b. **Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.**
- c. **Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, force majeure or delay events, damage to property by fire or other causes, or the discovery of any Constituent of Concern or Hazardous Environmental Condition.**

**12. Payment Requests: Review applications for payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the Schedule of Values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.**

**13. Certificates, Operation and Maintenance Manuals: During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Contract Documents to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.**

**14. Completion:**

- a. **Participate in Engineer's visits to the Site to determine Substantial Completion, assist in the determination of Substantial Completion and the preparation of a punch list of items to be completed or corrected.**
- b. **Participate in Engineer's final visit to the Site to determine completion of the Work, in the company of Owner and Contractor, and prepare a final punch list of items to be completed and deficiencies to be remedied.**
- c. **Observe whether all items on the final list have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the notice of acceptability of the work.**

**C. The RPR shall 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 Contractor's work.
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. Accept Shop Drawing or Sample submittals from anyone other than Contractor.
8. Authorize Owner to occupy the Project in whole or in part.

SC 10.10.A **Add** 10.10.A *American Iron & Steel:*

"A. "Services required to determine and certify that to the best of the Engineer's knowledge and belief all iron and steel products referenced in engineering analysis, the Plans, Specifications, Bidding Documents, and associated Bid Addenda requiring design revisions are either produced in the United States or are the subject of an approved waiver and services required to determine to the best of the engineer's knowledge and belief that approved substitutes, equals, and all iron and steel products proposed in the shop drawings, Change Orders and Partial Payment Estimates are either produced in the United States or are the subject of an approved waiver under Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017).

**ARTICLE 11 - AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK**

SC 11.06.A.1 **Modify** 11.06.A.1 by inserting the following sentence after "within 15 days after the submittal of the Change Proposal.":

"Include supporting data (name of manufacturer, city and state where the product was manufactured, description of product, signature of authorized manufacturer's representative) in the Manufacturer's Certification Letter, as applicable."

SC 11.07.C Add the following new Paragraph after Paragraph 11.07.B:

**All Contract Change Orders must be concurred in by Agency before they are effective.**

**ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK**

SC-13.02 *Allowances*

SC 13.02.C Delete Paragraph 13.02.C in its entirety and insert the following in its place:

**[Deleted]**

SC-13.03 *Unit Price Work*

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

- E. The unit price of an item of Unit Price Work shall be subject to reevaluation and adjustment under the following conditions:**

1. if 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 **20** percent from the estimated quantity of such item indicated in the Agreement; and
2. if there is no corresponding adjustment with respect to any other item of Work; and
3. if Contractor believes that Contractor has incurred additional expense as a result thereof, Contractor may submit a Change Proposal, or if Owner believes that the quantity variation entitles Owner to an adjustment in the unit price, Owner may make a Claim, seeking an adjustment in the Contract Price.

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

SC 14.03.G Add 14.03.G:

“G. Installation of Materials that are non-compliant with American Iron and Steel requirements shall be considered defective work.”

**ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD.**

SC 15.01.B Amend the second sentence of Paragraph 15.01.B.1 by striking out the following text: “a bill of sale, invoice, or other.”

SC 15.03.B 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, shall 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 Article 15.

SC 15.01.B.4 Add the following new Paragraph after Paragraph 15.01.B.3:

**The Application for Payment form to be used on this Project is EJCDC C-620. The Agency must approve all Applications for Payment before payment is made.**

SC 15.01.B.4 Add 15.01.B.4:

“4. By submitting Materials for payment, Contractor is certifying that the submitted Materials are compliant with American Iron and Steel requirements. Manufacturer’s Certification letter for Materials satisfy this certification. Refer to Manufacturer’s Certification Letter provided in these Contract Documents.”

SC 15.01.C.2.d Add 15.01.C.2.d:

“d. the Materials presented for payment comply with American Iron and Steel.”

SC 15.01.D.1 Delete Paragraph 15.01.D.1 in its entirety and insert the following in its place:

**The Application for Payment with Engineer’s recommendations will be presented to the Owner and Agency for consideration. If both the Owner and Agency find the Application**

for Payment acceptable, the recommended amount less any reduction under the provisions of Paragraph 15.01.E will become due twenty (20) days after the Application for Payment is presented to the Owner, and the Owner will make payment to the Contractor.

SC 15.02.A Amend Paragraph 15.02.A by striking out the following text: “no later than seven days after the time of payment by Owner” and insert “no later than the time of payment by Owner.”

SC 15.03.A **Modify** 15.03.A by adding the following after the last sentence:

“Services required to determine and certify that to the best of the Contractor’s knowledge and belief all substitutes, equals, and all iron and steel products proposed in the shop drawings, Change Orders and Partial Payment Estimates, and those installed for the project are either produced in the United States or are the subject of an approved waiver under Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference.”

## ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

SC-17.03 Add the following new paragraph immediately after Paragraph 17.02.

**SC-17.03 Attorneys’ Fees:** For any matter subject to final resolution under this Article, the prevailing party shall be entitled to an award of its attorneys’ fees incurred in the final resolution proceedings, in an equitable amount to be determined in the discretion of the court, arbitrator, arbitration panel, or other arbiter of the matter subject to final resolution, taking into account the parties’ initial demand or defense positions in comparison with the final result.

## ARTICLE 18 – MISCELLANEOUS

SC 18.09 Add the following new paragraph after Paragraph 18.08:

**Tribal Sovereignty.** No provision of this Agreement will be construed by any of the signatories as abridging or debilitating any sovereign powers of the {insert name of Tribe} Tribe; affecting the trust-beneficiary relationship between the Secretary of the Interior, Tribe, and Indian landowner(s); or interfering with the government-to-government relationship between the United States and the Tribe.

## ARTICLE 19 – FEDERAL REQUIREMENTS

SC 19 Add Article 19 titled “FEDERAL REQUIREMENTS”

SC 19.01 Add the following language as Paragraph 19.01 with the title “Agency Not a Party”:

**This Contract is expected to be funded in part with funds provided by Agency. Neither Agency, nor any of its departments, entities, or employees is a party to this Contract.**

SC 19.02 Add the following sections after Article 19.01 with the title “Contract Approval”:

- A. **Owner and Contractor will furnish Owner’s attorney such evidence as required so that Owner’s attorney can complete and execute the following “Certificate of Owner’s Attorney” (Exhibit I of RUS Bulletin 1780-26) before Owner submits the executed Contract Documents to Agency for approval.**



- B. Concurrence by Agency in the award of the Contract is required before the Contract is effective.**

SC 19.03 Add the following language after Article 19.02.B with the title “**Conflict of Interest**”:

- A. Contractor may not knowingly contract with a supplier or manufacturer if the individual or entity who prepared the plans and specifications has a corporate or financial affiliation with the supplier or manufacturer. Owner’s officers, employees, or agents shall not engage in the award or administration of this Contract if a conflict of interest, real or apparent, would be involved. Such a conflict would arise when: (i) the employee, officer or agent; (ii) any member of their immediate family;**
- (iii) their partner or (iv) an organization that employs, or is about to employ, any of the above, has a financial interest or other interest in or a tangible personal benefit from the Contractor. Owner’s officers, employees, or agents shall neither solicit nor accept gratuities, favors or anything of monetary value from Contractor or subcontractors.**

SC 19.04 Add the following language after Article 19.03.A with the title “**Gratuities**”:

- A. If Owner finds after a notice and hearing that Contractor, or any of Contractor’s agents or representatives, offered or gave gratuities (in the form of entertainment, gifts, or otherwise) to any official, employee, or agent of Owner or Agency in an attempt to secure this Contract or favorable treatment in awarding, amending, or making any determinations related to the performance of this Contract, Owner may, by written notice to Contractor, terminate this Contract. Owner may also pursue other rights and remedies that the law or this Contract provides. However, the existence of the facts on which Owner bases such findings shall be an issue and may be reviewed in proceedings under the dispute resolution provisions of this Contract.**
- B. In the event this Contract is terminated as provided in paragraph 19.04.A, Owner may pursue the same remedies against Contractor as it could pursue in the event of a breach of this Contract by Contractor. As a penalty, in addition to any other damages to which it may be entitled by law, Owner may pursue exemplary damages in an amount (as determined by Owner) which shall not be less than three nor more than ten times the costs Contractor incurs in providing any such gratuities to any such officer or employee.**

SC 19.05 Add the following language after Article 19.04.B with the title “**Small, Minority and Women’s Businesses**”:

- A. Contracting with small and minority businesses, women’s business enterprises, and labor surplus area firms. If Contractor intends to let any subcontracts for a portion of the work, Contractor must take all necessary affirmative steps to assure that minority businesses, women’s business enterprises, and labor surplus area firms are used when possible. Affirmative steps must include:**
- (1) Placing qualified small and minority businesses and women’s business enterprises on solicitation lists;**
  - (2) Assuring that small and minority businesses, and women’s business enterprises are solicited whenever they are potential sources;**

- (3) Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;**
- (4) Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises;**
- (5) Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce; and**

SC 19.06 Add the following after Article 19.05.A.(5) with the title “Anti-Kickback”:

- A. Contractor shall comply with the Copeland Anti-Kickback Act (40 U.S.C 3145) as supplemented by Department of Labor regulations (29 CFR Part 3, “Contractors and Subcontractors on Public Buildings or Public Work Financed in Whole or in Part by Loans or Grants from the United States”). The Act provides that Contractor or subcontractor must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. Owner shall report all suspected or reported violations to Agency.**

SC 19.07 Add the following after Article 19.06.A with the title “Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended”:

- A. Contractor to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).**

SC 19.08 Add the following after Article 19.07 A with the title “Equal Employment Opportunity”:

- A. The Contract is considered a federally assisted construction contract. Except as otherwise provided under 41 CFR Part 60, all contracts that meet the definition of “federally assisted construction contract” in 41 CFR Part 60-1.3 must include the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, “Equal Employment Opportunity” (30 FR 12319, 12935, 3 CFR Part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, “Amending Executive Order 11246 Relating to Equal Employment Opportunity,” and implementing regulations at 41 CFR part 60, “Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor.”**

SC 19.09 Add the following after Article 19.08.A with the title “Byrd Anti-Lobbying Amendment (31 U.S.C. 1352)”:

- A. Contractors that apply or bid for an award exceeding \$100,000 must file the required certification (RD Instruction 1940-Q, Exhibit A-1). The Contractor certifies to the Owner and every subcontractor certifies to the Contractor that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress**

in connection with obtaining the Contract if it is covered by 31 U.S.C. 1352. The Contractor and every subcontractor must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the Owner. Necessary certification and disclosure forms shall be provided by Owner.

SC 19.10 Add the following after Article 19.09.A with the title “Environmental Requirements”:

When constructing a Project involving trenching and/or other related earth excavations, Contractor shall comply with the following environmental conditions:

- A. Wetlands – When disposing of excess, spoil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert wetlands.
- B. Floodplains – When disposing of excess, spoil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert 100-year floodplain areas (Standard Flood Hazard Area) delineated on the latest Federal Emergency Management Agency Floodplain Maps, or other appropriate maps, e.g., alluvial soils on NRCS Soil Survey Maps.
- C. Historic Preservation – Any excavation by Contractor that uncovers an historical or archaeological artifact or human remains shall be immediately reported to Owner and a representative of Agency. Construction shall be temporarily halted pending the notification process and further directions issued by Agency after consultation with the State Historic Preservation Officer (SHPO).
- D. Endangered Species – Contractor shall comply with the Endangered Species Act, which provides for the protection of endangered and/or threatened species and critical habitat. Should any evidence of the presence of endangered and/or threatened species or their critical habitat be brought to the attention of Contractor, Contractor will immediately report this evidence to Owner and a representative of Agency. Construction shall be temporarily halted pending the notification process and further directions issued by Agency after consultation with the U.S. Fish and Wildlife Service.
- E. Mitigation Measures – The following environmental mitigation measures are required on this Project: {Insert mitigation measures here}.

SC 19.11 Add the following after Article 19.10.E. with the title “Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708)”:

- A. Where applicable, for contracts awarded by the Owner in excess of \$100,000 that involve the employment of mechanics or laborers, the Contractor must comply with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, the Contractor must compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to

**the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.**

SC 19.12 Add the following after Article 19.11.A. with the title **“Debarment and Suspension (Executive Orders 12549 and 12689)”**:

- A. A contract award (see 2 CFR 180.220) must not be made to parties listed on the governmentwide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), “Debarment and Suspension.” SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.**

SC 19.13 Add the following after Article 19.12.A. with the title **“Procurement of recovered materials”**:

- A. The Contractor must comply with 2 CFR Part 200.322, “Procurement of recovered materials.”**

SC 19.14 **Add** “Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference applies an American Iron and Steel requirement to this project. All iron and steel products used in this project must be produced in the United States. The term “iron and steel products” means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials. The de minimis and minor components waiver *{add project specific waivers as applicable}* apply to this contract.”

SC 19.15 **Add** SC 19.15 Definitions:

“Assistance recipient” is the entity that receives funding assistance from programs required to comply with Section 746 Division A, Title VII of the Consolidated Appropriations Act of 2017 (Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference. This term includes owner and/or applicant.

“Certifications” means the following:

- *Manufacturers’* certification is documentation provided by the manufacturer or fabricator to various entities stating that the iron and steel products to be used in the project are produced in the United States in accordance with American Iron and Steel (AIS) Requirements. If items are purchased via a supplier, distributor, vendor, etc. vs. from the manufacturer or fabricator directly, then the supplier, distributor, vendor, etc. will be responsible for obtaining and providing these certification letters to the parties purchasing the products.
- *Engineers’* certification is documentation that plans, specifications, and bidding documents comply with AIS.
- *Contractors’* certification is documentation submitted upon substantial completion of the project that all iron and steel products installed were produced in the United States.

“Coating” means a covering that is applied to the surface of an object. If a coating is applied to the external surface of a domestic iron or steel component, and the application takes place outside of the United States, said product would be considered a compliant product under the AIS

requirements. Any coating processes that are applied to the external surface of iron and steel components that would otherwise be AIS compliant would not disqualify the product from meeting the AIS requirements regardless of where the coating processes occur, provided that final assembly of the product occurs in the United States. This exemption only applies to coatings on the *external surface* of iron and steel components. It does not apply to coatings or linings on internal surfaces of iron and steel products, such as the lining of lined pipes. All manufacturing processes for lined pipes, including the application of pipe lining, must occur in the United States for the product to be compliant with AIS requirements.

“Construction materials” are those articles, materials, or supplies made primarily of iron and steel, that are permanently incorporated into the project, not including mechanical and/or electrical components, equipment and systems. Some of these products may overlap with what is also considered “structural steel”.

*Note:* Mechanical and electrical components, equipment and systems are not considered construction materials. See definition of mechanical and electrical equipment.

“Consulting engineer” is an individual or entity with which the owner has contracted to perform engineering/architectural services for water and waste projects funded by the programs subject to AIS requirements).

“De minimis incidental components” are various miscellaneous low-cost components that are essential for, but incidental to, the construction and are incorporated into the physical structure of the project. Examples of incidental components could include small washers, screws, fasteners (such as “off the shelf” nuts and bolts), miscellaneous wire, corner bead, ancillary tube, signage, trash bins, door hardware etc.

Costs for such de minimis incidental components cumulatively may comprise no more than a total of five percent of the total cost of the materials used in and incorporated into a project; the cost of an individual item may not exceed one percent of the total cost of the materials used in and incorporated into a project.

“General contractor” is the individual or entity with which the applicant has contracted (*or is expected to*) to perform construction services (or for water and waste projects funded by the programs subject to AIS requirements).

This includes bidders, contractors that have received an award from the applicant and any party having a direct contractual relationship with the owner/applicant. A general contractor is often referred to as the prime contractor.

“Iron and steel products” are defined as the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials. Only items on the above list made primarily of iron or steel, permanently incorporated into the project must be produced in the United States. For example trench boxes, scaffolding or equipment, which are removed from the project site upon completion of the project, are not required to be made of U.S. Iron or Steel.

“Manufacturers” meaning a supplier, fabricator, distributor, materialman, or vendor is an entity with which the applicant, general contractor or with any subcontractor has contracted to furnish materials or equipment to be incorporated in the project by the applicant, contractor or a subcontractor.

“Manufacturing processes” are processes such as melting, refining, forming, rolling, drawing, finishing, and fabricating. Further, if a domestic iron and steel product is taken out of the United States for any part of the manufacturing process, it becomes foreign source material. However,

raw materials such as iron ore, limestone and iron and steel scrap are not covered by the AIS requirement, and the material(s), if any, being applied as a coating are similarly not covered. Non-iron or steel components of an iron and steel product may come from non-US sources. For example, for products such as valves and hydrants, the individual non-iron and steel components do not have to be of domestic origin. Raw materials, such as iron ore, limestone, scrap iron, and scrap steel, can come from non-U.S. sources.

“Mechanical equipment” is typically that which has motorized parts and/or is powered by a motor. “Electrical equipment” is typically any machine powered by electricity and includes components that are part of the electrical distribution system. AIS does apply to mechanical equipment.

“Minor components” are components *within* an iron and/or steel product otherwise compliant with the American Iron and Steel requirements. This is different from the de minimis definition where de minimis pertains to the entire project and the minor component definition pertains to a single product. This waiver, would allow non-domestically produced miscellaneous minor components comprising up to five percent of the total material cost of an otherwise domestically produced iron and steel product to be used. However, unless a separate waiver for a product has been approved, all other iron and steel components in said product must still meet the AIS requirements. This waiver does not exempt the whole product from the AIS requirements only minor components within said product and the iron or steel components of the product must be produced domestically. Valves and hydrants are also subject to the cost ceiling requirements described here. Examples of minor components could include items such pins and springs in valves/hydrants, bands/straps in couplings, and other low cost items such as small fasteners etc.

“Municipal castings” are cast iron or steel infrastructure products that are melted and cast. They typically provide access, protection, or housing for components incorporated into utility owned drinking water, storm water, wastewater, and solid waste infrastructure.

“National Office” refers to the office responsible for the oversight and administration of the program nationally. The National Office sets policy, develops program regulations, and provides training and technical assistance to help the state offices administer the program. The National Office is located in Washington, D.C.

“Owner” is the individual or entity with which the general contractor has contracted regarding the work, and which has agreed to pay the general contractor for the performance of the work, pursuant to the terms of the contract for water and waste projects funded by the programs subject to AIS requirements. For the purpose of this Bulletin, this term is synonymous with the term “applicant” as defined in 7 CFR 1780.7 (a) (1), (2) and (3) and is an entity receiving financial assistance from the programs subject to the AIS requirements.

“Pass through Entities” is an entity that provides a subaward to a loan and/or grant recipient to carry out part of a Federal program. Examples are grantees utilizing the Revolving Loan Program and Household Water Well Program and Alaska Native Tribal Health Consortium (ANTHC) or the State of Alaska from the RAVG Program.

“Primarily iron or steel” is defined as a product made of greater than 50 percent iron or steel, measured by cost. The cost should be based on the material costs. An exception to this definition is reinforced precast concrete (see Definitions). All technical specifications and applicable industry standards (e.g. NIST, NSF, AWWA) must be met. If a product is determined to be less than 50 percent iron and steel, the AIS requirements do not apply.

For example, the cost of a fire hydrant includes:

- 1) The cost of materials used for the iron portion of a fire hydrant (e.g. bonnet, body and shoe); and
- 2) The cost to pour and cast to create those components (e.g. labor and energy).

Not included in the cost are:

- 1) The additional material costs for the non-iron and steel internal workings of the hydrant (e.g. stem, coupling, valve, seals, etc.); and
- 2) The cost to assemble the internal workings into the hydrant body.

“Produced in the United States” means that the production in the United States of the iron or steel products used in the project requires that all manufacturing processes must take place in the United States, with the exception of metallurgical processes involving refinement of steel additives.

“Project” is the total undertaking to be accomplished for the applicant by consulting engineers, general contractors, and others, including the planning, study, design, construction, testing, commissioning, and start-up, and of which the work to be performed under the contract is a part. A project includes all activity that an applicant is undertaking to be financed in whole or part by programs subject to AIS requirements. The intentional splitting of projects into separate and smaller contracts or obligations to avoid AIS requirements is prohibited.

“Reinforced Precast Concrete” may not consist of at least 50 percent iron or steel, but the reinforcing bar and wire must be produced in the United States and meet the same standards as for any other iron or steel product.

Additionally, the casting of the concrete product must take place in the United States. The cement and other raw materials used in concrete production are not required to be of domestic origin. If the reinforced concrete is cast at the construction site, the reinforcing bar and wire are considered to be a construction material and must be produced in the United States. The cement and other raw materials used in concrete production are not required to be of domestic origin. If the reinforced concrete is cast at the construction site, the reinforcing bar and wire are considered to be a construction material and must be produced in the United States.

“Steel” means an alloy that includes at least 50 percent iron, between 0.02 and 2 percent carbon, and may include other elements. Metallic elements such as chromium, nickel, molybdenum, manganese, and silicon may be added during the melting of steel for the purpose of enhancing properties such as corrosion resistance, hardness, or strength. The definition of steel covers carbon steel, alloy steel, stainless steel, tool steel, and other specialty steels.

“Structural steel” is rolled flanged shapes, having at least one dimension of their cross-section three inches or greater, which are used in the construction of bridges, buildings, ships, railroad rolling stock, and for numerous other constructional purposes. Such shapes are designated as wide-flange shapes, standard I-beams, channels, angles, tees, and zees. Other shapes include but are not limited to, H-piles, sheet piling, tie plates, cross ties, and those for other special purposes.

“Ultimate recipient” is a loan or grant recipient receiving funds from a pass-through entity. Examples include: (1) a loan recipient from the Revolving Loan Fund; (2) a loan recipient from the Household Water Well Program; and (3) a grant recipient from ANTHC or the State of Alaska from the RAVG Program.

“United States” means each of the several states, the District of Columbia, and each Federally Recognized Indian Tribe.

## PERFORMANCE BOND

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER : **Rawls Springs Utility District**  
**39 Archie Smith Road**  
**Hattiesburg, MS 39402**

### CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location)*:

### BOND

Bond Number:

Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:

Amount:

Modifications to this Bond Form:  None  See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

### CONTRACTOR AS PRINCIPAL

### SURETY

\_\_\_\_\_  
*(seal)*  
Contractor's Name and Corporate Seal

\_\_\_\_\_  
*(seal)*  
Surety's Name and Corporate Seal

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Signature *(attach power of attorney)*

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest: \_\_\_\_\_  
Signature

Attest: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

**Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.**



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 shall 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 shall 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 shall 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 shall 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 shall 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 shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall 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 shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than 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 may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after 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 shall be applicable.

12. Notice to the Surety, the Owner, or the Contractor shall 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 shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall 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 shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

16. Modifications to this Bond are as follows:

FOR VIEWING ONLY  
NOT FOR BIDDING PURPOSES

## PAYMENT BOND

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

**OWNER: Rawls Springs Utility District  
39 Archie Smith Road  
Hattiesburg, MS 39402**

CONSTRUCTION CONTRACT: Rawls Springs Utility District Water System Improvements – 2020  
Contract Number 1 – Waterlines and Tank Sites Improvements

Effective Date of the Agreement:

Amount:

Description *(name and location)*:

### BOND

Bond Number:

Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:

Amount:

Modifications to this Bond Form:  None  See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

### CONTRACTOR AS PRINCIPAL

### SURETY

\_\_\_\_\_  
*(seal)*  
Contractor's Name and Corporate Seal

\_\_\_\_\_  
*(seal)*  
Surety's Name and Corporate Seal

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Signature *(attach power of attorney)*

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest: \_\_\_\_\_  
Signature

Attest: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

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 shall 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 shall 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 shall 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 shall 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 shall 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 shall 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 satisfy 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 shall 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 shall be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall 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 shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall 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:
1. The name of the Claimant;
  2. The name of the person for whom the labor was done, or materials or equipment furnished;
  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;
  4. A brief description of the labor, materials, or equipment furnished;
  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;
  6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
  7. The total amount of previous payments received by the Claimant; and
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 shall be 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 shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.
18. Modifications to this Bond are as follows:

**Contractor's Application for Payment No.** \_\_\_\_\_

Application Period:	Application Date:
To (Owner):	From (Contractor):
Project:	Contract:
Owner's Contract No.:	Contractor's Project No.:
	Engineer's Project No.:

**Application For Payment  
Change Order Summary**

Approved Change Orders	1. ORIGINAL CONTRACT PRICE.....	\$
Number	2. Net change by Change Orders.....	\$
Additions	3. Current Contract Price (Line 1 ± 2).....	\$
Deductions	4. TOTAL COMPLETED AND STORED TO DATE (Column F total on Progress Estimates).....	\$
	5. RETAINAGE:	
	a. X Work Completed.....	\$
	b. X Stored Material.....	\$
	c. Total Retainage (Line 5.a + Line 5.b).....	\$
	6. AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5.c).....	\$
TOTALS	7. LESS PREVIOUS PAYMENTS (Line 6 from prior Application).....	\$
NET CHANGE BY	8. AMOUNT DUE THIS APPLICATION.....	\$
CHANGE ORDERS	9. BALANCE TO FINISH, PLUS RETAINAGE (Column G total on Progress Estimates + Line 5.c above).....	\$

**Contractor's Certification**

The undersigned Contractor certifies, to the best of its knowledge, the following:

(1) All previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with the Work covered by prior Applications for Payment;

(2) Title to all Work, materials and equipment incorporated in said Work, or otherwise listed in or covered by this Application for Payment, will pass to Owner at time of payment free and clear of all Liens, security interests, and encumbrances (except such as are covered by a bond acceptable to Owner indemnifying Owner against any such Liens, security interest, or encumbrances); and

(3) All the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

**Contractor Signature**

By: \_\_\_\_\_ Date: \_\_\_\_\_

Payment of: \$ \_\_\_\_\_  
(Line 8 or other - attach explanation of the other amount)

is recommended by: \_\_\_\_\_ (Engineer) \_\_\_\_\_ (Date)

Payment of: \$ \_\_\_\_\_  
(Line 8 or other - attach explanation of the other amount)

is approved by: \_\_\_\_\_ (Owner) \_\_\_\_\_ (Date)

Approved by: \_\_\_\_\_ (Date)  
Funding or Financing Entity (if applicable)



Date of Issuance: \_\_\_\_\_ Effective Date: \_\_\_\_\_  
 Owner: \_\_\_\_\_ Owner's Contract No.: \_\_\_\_\_  
 Contractor: \_\_\_\_\_ Contractor's Project No.: \_\_\_\_\_  
 Engineer: \_\_\_\_\_ Engineer's Project No.: \_\_\_\_\_  
 Project: \_\_\_\_\_ Contract Name: \_\_\_\_\_

The Contract is modified as follows upon execution of this Change Order:

Description: \_\_\_\_\_

Attachments: *[List documents supporting change]*

CHANGE IN CONTRACT PRICE	CHANGE IN CONTRACT TIMES <i>[note changes in Milestones if applicable]</i>
Original Contract Price: \$ _____	Original Contract Times: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
[Increase] [Decrease] from previously approved Change Orders No. ___ to No. ___: \$ _____	[Increase] [Decrease] from previously approved Change Orders No. ___ to No. ___: Substantial Completion: _____ Ready for Final Payment: _____ days
Contract Price prior to this Change Order: \$ _____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
[Increase] [Decrease] of this Change Order: \$ _____	[Increase] [Decrease] of this Change Order: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
Contract Price incorporating this Change Order: \$ _____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for Final Payment: _____ days or dates

<p><b>RECOMMENDED:</b></p> <p>By: _____                  Engineer (if required)</p> <p>Title: _____</p> <p>Date: _____</p>	<p><b>ACCEPTED:</b></p> <p>By: _____                  Owner (Authorized Signature)</p> <p>Title: _____</p> <p>Date: _____</p>	<p><b>ACCEPTED:</b></p> <p>By: _____                  Contractor (Authorized Signature)</p> <p>Title: _____</p> <p>Date: _____</p>
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Approved by Funding Agency (if applicable)

By: \_\_\_\_\_ Date: \_\_\_\_\_  
 Title: \_\_\_\_\_



**NOTICE TO PROCEED**

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Owner: \_\_\_\_\_ Owner's Contract No.: \_\_\_\_\_  
Contractor: \_\_\_\_\_ Contractor's Project No.: \_\_\_\_\_  
Engineer: \_\_\_\_\_ Engineer's Project No.: \_\_\_\_\_  
Project: \_\_\_\_\_ Contract Name: \_\_\_\_\_  
Effective Date of Contract: \_\_\_\_\_

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**TO CONTRACTOR:**

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on [\_\_\_\_\_, 20\_\_]. [see Paragraph 4.01 of the General Conditions]

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work shall be done at the Site prior to such date. In accordance with the Agreement, [the date of Substantial Completion is \_\_\_\_\_, and the date of readiness for final payment is \_\_\_\_\_] **or** [the number of days to achieve Substantial Completion is \_\_\_\_\_ and the number of days to achieve readiness for final payment is \_\_\_\_\_].

Before starting any Work at the Site, Contractor must comply with the following:  
[Note any access limitations, security procedures, or other restrictions]

---

Owner:

Authorized Signature

By:

Title:

Date Issued:

Copy: Engineer

FOR VIEWING ONLY  
NOT FOR BIDDING PURPOSES

**CERTIFICATE OF SUBSTANTIAL COMPLETION**

Owner:  
Contractor:  
Engineer:  
Project:

Owner's Contract No.:  
Contractor's Project No.:  
Engineer's Project No.:  
Contract Name:

**This [preliminary] [final] Certificate of Substantial Completion applies to:**

- All Work  The following specified portions of the Work:

**Date of Substantial Completion**

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work shall be as provided in the Contract, except as amended as follows: *[Note: Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.]*

Amendments to Owner's responsibilities:

- None  
 As follows

Amendments to Contractor's responsibilities:

- None  
 As follows:

The following documents are attached to and made a part of this Certificate: *[punch list; others]*

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract.

EXECUTED BY ENGINEER:

RECEIVED:

RECEIVED:

By: _____ (Authorized signature)	By: _____ Owner (Authorized Signature)	By: _____ Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____

**C. USDA RUS DOCUMENTS**

FOR VIEWING ONLY  
NOT FOR BIDDING PURPOSES

### COMPLIANCE STATEMENT

This statement relates to a proposed contract with \_\_\_\_\_

\_\_\_\_\_  
(Name of borrower or grantee)

who expects to finance the contract with assistance from either the Rural Housing Service (RHS), Rural Business-Cooperative Service (RBS), or the Rural Utilities Service (RUS) or their successor agencies, United States Department of Agriculture (whether by a loan, grant, loan insurance, guarantee, or other form of financial assistance). I am the undersigned bidder or prospective contractor, I represent that:

1.  I have,  have not, participated in a previous contract or subcontract subject to Executive Order 11246 (regarding equal employment opportunity) or a preceding similar Executive Order.
2. If I have participated in such a contract or subcontract,  I have,  have not, filed all compliance reports that have been required to file in connection with the contract or subcontract.

If the proposed contract is for \$50,000 or more and I have 50 or more employees, I also represent that:

3.  I have,  have not previously had contracts subject to the written affirmative action programs requirements of the Secretary of Labor.
4. If I have participated in such a contract or subcontract,  I have,  have not developed and placed on file at each establishment affirmative action programs as required by the rules and regulations of the Secretary of Labor.

I understand that if I have failed to file any compliance reports that have been required of me, I am not eligible and will not be eligible to have my bid considered or to enter into the proposed contract unless and until I make an arrangement regarding such reports that is satisfactory to either the RHS, RBS or RUS, or to the office where the reports are required to be filed.

I also certify that I do not maintain or provide for my employees any segregated facilities at any of my establishments, and that I do not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I certify further that I will not maintain or provide for my employees any segregated facilities at any of my establishments, and that I will not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I agree that a breach of this certification is a violation of the Equal Opportunity clause in my contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and wash rooms, restaurants and other eating areas time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. I further agree that (except where I have obtained identical certifications for proposed subcontractors for specific time periods) I will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause; that I will retain such certifications in my files; and that I will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods): (See Reverse).

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According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays the valid OMB control number. The valid OMB control number for this information collection is 0575-0018. The time required to complete this information collection is estimated to average 10 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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**NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENTS FOR  
CERTIFICATIONS OF NON-SEGREGATED FACILITIES**

A certification of Nonsegregated Facilities, as required by the May 9, 1967, order (32F.R. 7439, may 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted prior to the award of a subcontract exceeding \$ 10,000 which is not exempt from the provisions of the Equal Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

Date \_\_\_\_\_

\_\_\_\_\_  
*(Signature of Bidder or Prospective Contractor)*

\_\_\_\_\_  
*Address (including Zip Code)*

FOR VIEWING ONLY  
NOT FOR BIDDING PURPOSES



**Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion AD-1048  
Lower Tier Covered Transactions**

*The following statement is made in accordance with the Privacy Act of 1974 (5 U.S.C. § 552a, as amended). This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, and 2 C.F.R. §§ 180.300, 180.335, Participants' responsibilities. The regulations were amended and published on August 31, 2005, in 70 Fed. Reg. 51865-51880. Copies of the regulations may be obtained by contacting the Department of Agriculture agency offering the proposed covered transaction.*

*According to the Paperwork Reduction Act of 1995 an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0505-0027. The time required to complete this information collection is estimated to average 15 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. The provisions of appropriate criminal, civil, fraud, privacy, and other statutes may be applicable to the information provided.*

***(Read instructions on page two before completing certification.)***

- A. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency;
- B. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

ORGANIZATION NAME	PR/AWARD NUMBER OR PROJECT NAME
NAME(S) AND TITLE(S) OF AUTHORIZED REPRESENTATIVE(S)	
SIGNATURE(S)	DATE

*In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.*

*Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotape, American Sign Language, etc.) should contact the responsible agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.*

*To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at [How to File a Program Discrimination Complaint \(https://www.ascr.usda.gov/filing-program-discrimination-complaint-usda-customer\)](https://www.ascr.usda.gov/filing-program-discrimination-complaint-usda-customer) and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1) mail: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410; (2) fax: (202) 690-7442.*

### Instructions for Certification

- (1) By signing and submitting this form, the prospective lower tier participant is providing the certification set out on page 1 in accordance with these instructions.
- (2) The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension or debarment.
- (3) The prospective lower tier participant shall provide immediate written notice to the person(s) to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
- (4) The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549, at 2 C.F.R. Parts 180 and 417. You may contact the department or agency to which this proposal is being submitted for assistance in obtaining a copy of those regulations.
- (5) The prospective lower tier participant agrees by submitting this form that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
- (6) The prospective lower tier participant further agrees by submitting this form that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – Lower Tier Covered Transactions," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
- (7) A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the System for Award Management (SAM) database.
- (8) Nothing contained in the foregoing shall be construed to require establishment of a system of records to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- (9) Except for transactions authorized under paragraph (5) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

CERTIFICATION FOR CONTRACTS, GRANTS AND LOANS

The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant or Federal loan, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant or loan.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant or loan, the undersigned shall complete and submit Standard Form - LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including contracts, subcontracts, and subgrants under grants and loans) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

\_\_\_\_\_  
(name)

\_\_\_\_\_  
(date)

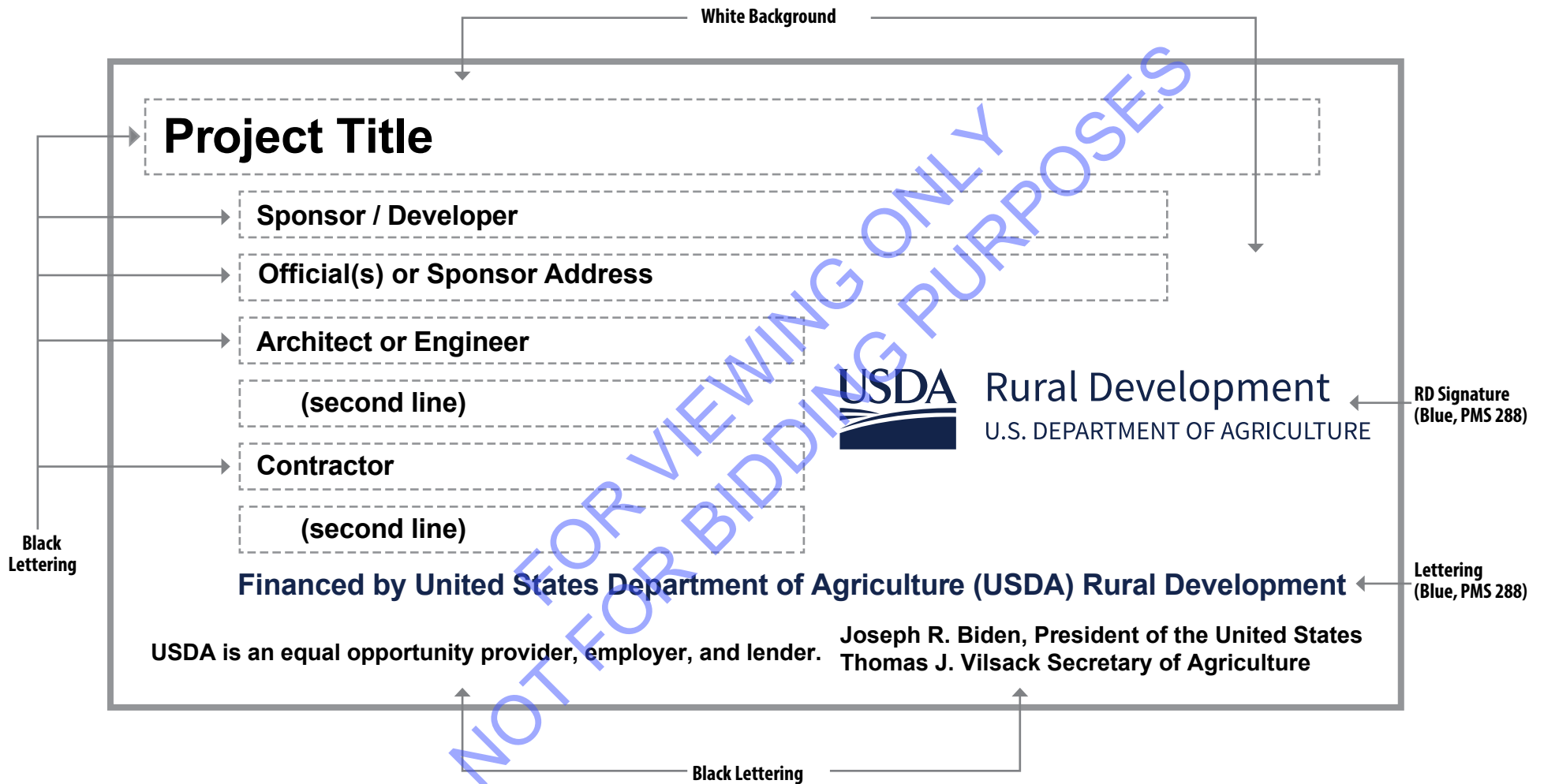
\_\_\_\_\_  
(title)

oOo



# TEMPORARY CONSTRUCTION SIGN FOR RURAL DEVELOPMENT PROJECTS

Recommended Fonts: Helvetica or Arial



**SIGN DIMENSIONS** : 1200 mm x 2400 mm x 19 mm (approx. 4' x 8' x 3/4")  
**PLYWOOD PANEL (APA RATED A-B GRADE-EXTERIOR)**

**RAWLS SPRINGS UTILITY DISTRICT  
WATER SYSTEM IMPROVEMENTS - 2020  
Contract Number 1 – Waterline and Tank Sites Improvements**

**PROJECT SIGN WORDING**

Please refer to the project sign drawing in this section and Section 13200 of the technical specifications for construction requirements. Following is the text that must be shown where indicated on the project sign drawing.

Project Title: **RAWLS SPRINGS UTILITY DISTRICT WATER SYSTEM IMPROVEMENTS – 2020**

Contract Number 1 – Waterline and Well Sites Improvements

Sponsor: Rawls Springs Utility District

Ray Anthony “Tony” Muli, President

Engineer: W Engineering, P.A.

301 Central Ave, Wiggins, MS 39577

Contractor: TBD\*

Address: TBD\*

\*To Be Determined After Bidding. Do not fill in these lines of the sign until the Contractor has been identified.

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NOT FOR BIDDING PURPOSES

**CERTIFICATE OF OWNER'S ATTORNEY AND AGENCY CONCURRENCE**

CERTIFICATE OF OWNER'S ATTORNEY

PROJECT NAME:

---

CONTRACTOR NAME:

---

I, the undersigned, \_\_\_\_\_, the duly authorized and acting legal representative of \_\_\_\_\_, do hereby certify as follows: I have examined the attached Contract(s) and performance and payment bond(s) and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements is adequate and has been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with the terms, conditions, and provisions thereof.

---

Name

Date

AGENCY CONCURRENCE

As lender or insurer of funds to defray the costs of this Contract, and without liability for any payments thereunder, the Agency hereby concurs in the form, content, and execution of this Agreement.

---

Agency Representative

Date

---

Name

**ENGINEER'S CERTIFICATION OF FINAL PLANS AND SPECIFICATIONS**

PROJECT NAME: \_\_\_\_\_

The final Drawings and Specifications, other assembled Construction Contract Documents, bidding-related documents (or requests for proposals or other construction procurement documents), and any other Final Design Phase deliverables, comply with all requirements of the U.S. Department of Agriculture, Rural Utilities Service, to the best of my knowledge and professional judgment.

If the Engineers Joint Contract Documents Committee (EJCDC) documents have been used, all modifications required by RUS Bulletin 1780-26 have been made in accordance with the terms of the license agreement, which states in part that the Engineer "must plainly show all changes to the Standard EJCDC Text, using 'Track Changes' (redline/strikeout), highlighting, or other means of clearly indicating additions and deletions." Such other means may include attachments indicating changes (e.g. Supplementary Conditions modifying the General Conditions).

\_\_\_\_\_  
Engineer

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name and Title

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## AMERICAN IRON &amp; STEEL COMPLIANCE STATEMENT

“Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference applies an American Iron and Steel requirement to this project.

All parties are required to comply with these requirements and to ensure that all iron and steel products used in this project must be produced in the United States. The term “iron and steel products” means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials.”

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ENGINEER'S CERTIFICATION OF COMPLIANCE WITH PROVISIONS OF THE AMERICAN IRON AND STEEL REQUIREMENTS OF SECTION 746 OF TITLE VII OF THE CONSOLIDATED APPROPRIATIONS ACT OF 2017 (DIVISION A - AGRICULTURE, RURAL DEVELOPMENT, FOOD AND DRUG ADMINISTRATION, AND RELATED AGENCIES APPROPRIATIONS ACT, 2017) AND SUBSEQUENT STATUTES MANDATING DOMESTIC PREFERENCE

DATE:

**RE: PROJECT NAME**  
**APPLICANT**  
**CONTRACT NUMBER**

I hereby certify that to the best of my knowledge and belief all iron and steel products referenced in the Plans, Specifications, and Bidding Documents for this project comply with Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference or are the subject of a waiver approved by the Secretary of Agriculture or designee. This certification is not intended to be a warranty in any way, but rather the designer's professional opinion that to the best of their knowledge the documents comply.

I hereby commit that to the best of my ability all iron and steel products that will be referenced in the Bid Addenda, Executed Contracts, and Change Orders will comply with Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference or will be the subject of a waiver approved by the Secretary of Agriculture or designee.

\_\_\_\_\_  
Name of Engineering Firm (PRINT)

\_\_\_\_\_  
By Authorized Representative (SIGNATURE)

\_\_\_\_\_  
Title

This letter is to be submitted prior to Agency authorization of Advertisement for Bids.

GENERAL (PRIME) CONTRACTOR'S CERTIFICATION OF COMPLIANCE WITH PROVISIONS OF THE AMERICAN IRON AND STEEL REQUIREMENTS OF SECTION 746 OF TITLE VII OF THE CONSOLIDATED APPROPRIATIONS ACT OF 2017 (DIVISION A - AGRICULTURE, RURAL DEVELOPMENT, FOOD AND DRUG ADMINISTRATION, AND RELATED AGENCIES APPROPRIATIONS ACT, 2017) AND SUBSEQUENT STATUTES MANDATING DOMESTIC PREFERENCE

DATE:

**RE: PROJECT NAME**  
**APPLICANT**  
**CONTRACT NUMBER**

I hereby certify that to the best of my knowledge and belief all iron and steel products installed for this project by my company and by any and all subcontractors and manufacturers my company has contracted with for this project comply with Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference or are the subject of a waiver approved by the Secretary of Agriculture or designee.

This certification is to be submitted upon completion of the project to the project engineer.

\_\_\_\_\_  
Name of Construction Company (PRINT)

\_\_\_\_\_  
By Authorized Representative (SIGNATURE)

\_\_\_\_\_  
Title

EXAMPLE OF A MANUFACTURER'S CERTIFICATION LETTER OF COMPLIANCE WITH PROVISIONS OF THE AMERICAN IRON AND STEEL (AIS) REQUIREMENTS OF SECTION 746 OF TITLE VII OF THE CONSOLIDATED APPROPRIATIONS ACT OF 2017 (DIVISION A - AGRICULTURE, RURAL DEVELOPMENT, FOOD AND DRUG ADMINISTRATION, AND RELATED AGENCIES APPROPRIATIONS ACT, 2017) AND SUBSEQUENT STATUTES MANDATING DOMESTIC PREFERENCE

Date:

Company Name:

Company Address:

Subject: AIS Step Certification for Project (X), Owner's Name, and Contract Number

I, (company representative), certify that the (melting, bending, galvanizing, cutting, etc.) processes for (manufacturing or fabricating) the following products and/or material shipped or provided for the subject project is in full compliance with the AIS requirement as mandated by Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference.

Item, Products and/or Materials, and location of delivery (City, State):

- 1.
- 2.

Such processes for AIS took place at the following location:

---

(City, State)

This certification is to be submitted upon request to interested parties (e.g. municipalities, consulting engineers, general contractors, etc.)

If any of the above compliance statements change while providing materials to this project, please immediately notify the person(s) who is requesting to use your product(s).

---

Authorized Company Representative Signature

(Note: *Authorized signature shall be manufacturer's representative not the material distributor or supplier*)



EXAMPLES OF MUNICIPAL CASTINGS (*includes but not limited to*):

Access Hatches;  
Ballast Screen;  
Benches (Iron or Steel);  
Bollards;  
Cast Bases;  
Cast Iron Hinged Hatches, Square and Rectangular;  
Cast Iron Riser Rings;  
Catch Basin Inlet;  
Cleanout/Monument Boxes;  
Construction Covers and Frames;  
Curb and Corner Guards;  
Curb Openings;  
Detectable Warning Plates;  
Downspout Shoes (Boot, Inlet);  
Drainage Grates, Frames and Curb Inlets;  
Inlets;  
Junction Boxes;  
Lampposts;  
Manhole Covers, Rings and Frames, Risers;  
Meter Boxes;  
Service Boxes;  
Steel Hinged Hatches, Square and Rectangular;  
Steel Riser Rings;  
Trash receptacles;  
Tree Grates;  
Tree Guards;  
Trench Grates; and  
Valve Boxes, Covers and Risers.

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EXAMPLES OF CONSTRUCTION MATERIALS *(includes but not limited to):*

Wire rod, bar, angles  
Concrete reinforcing bar, wire, wire cloth  
Wire rope and cables  
Tubing  
Framing  
Joists  
Trusses  
Fasteners (i.e., nuts and bolts)  
Welding rods  
Decking  
Grating  
Railings  
Stairs  
Access ramps  
Fire escapes  
Ladders  
Wall panels  
Dome structures  
Roofing  
Ductwork  
Surface drains  
Cable hanging systems  
Manhole steps  
Fencing and fence tubing  
Guardrails  
Doors  
Stationary screens

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EXAMPLES OF NON-CONSTRUCTION MATERIALS – *(includes but not limited to):*  
(NOTE: *includes appurtenances necessary for their intended use and operation and are not subject to AIS*)

Pumps  
Motors  
Gear reducers  
Drives (including variable frequency drives (VFDs))  
Electric/pneumatic/manual accessories used to operate valves (such as electric valve actuators)  
Mixers  
Gates (e.g. sluice and slide gates)  
Motorized screens (such as traveling screens)  
Blowers/aeration equipment  
Compressors  
Meters (flow and water meters)  
Sensors  
Controls and switches  
Supervisory control Data acquisition (SCADA)  
Membrane bioreactor systems  
Membrane filtration systems (includes RO package plants)  
Filters  
Clarifier arms and clarifier mechanisms  
Rakes  
Grinders  
Disinfection systems  
Presses (including belt presses)  
Conveyors  
Cranes  
HVAC (excluding ductwork)  
Water heaters  
Heat exchangers  
Generators  
Cabinetry and housings (such as electrical boxes/enclosures)  
Lighting fixtures  
Electrical conduit  
Emergency life systems  
Metal office furniture  
Shelving  
Laboratory equipment  
Analytical instrumentation  
Dewatering equipment.

**INFORMATIONAL CHECKLIST FOR PROJECT SPECIFIC WAIVER REQUEST**

Please reference the specifications of the product.

<b>Information</b>	<input type="checkbox"/>	<b>Note</b>
<p>General</p> <ul style="list-style-type: none"> <li>• Waiver request includes the following information:               <ul style="list-style-type: none"> <li>– Description of the foreign and domestic construction materials</li> <li>– Unit of measure</li> <li>– Quantity</li> <li>– Price</li> <li>– Date that product is needed (e.g. time of delivery or availability)</li> <li>– Location of the construction project</li> <li>– Name and address of the proposed supplier</li> <li>– A detailed justification for the use of foreign construction materials</li> </ul> </li> <li>• Waiver request was submitted according to the instructions in the memorandum</li> <li>• Assistance recipient made a good faith effort to solicit bids for domestic iron and steel products, as demonstrated by language in requests for proposals, contracts, and communications with the prime</li> </ul>		
<p>Cost Waiver Requests</p> <ul style="list-style-type: none"> <li>• Waiver request includes the following information:               <ul style="list-style-type: none"> <li>– Comparison of overall cost of project with domestic iron and steel products to overall cost of project with foreign iron and steel products (Exhibit J)</li> <li>– Relevant excerpts from the bid documents used by the contractors to complete the comparison</li> <li>– Supporting documentation indicating that the contractor made a reasonable survey of the market, such as a description of the process for identifying suppliers and a list of contacted suppliers</li> </ul> </li> </ul>		
<p>Availability Waiver Requests</p> <ul style="list-style-type: none"> <li>• Waiver request includes the following supporting documentation necessary to demonstrate the availability, quantity, and/or quality of the materials for which the waiver is requested:               <ul style="list-style-type: none"> <li>– Supplier information or pricing information from a reasonable number of domestic suppliers indicating availability/delivery date for construction materials</li> <li>– Documentation of the assistance recipient’s efforts to find available domestic sources, such as a description of the process for identifying suppliers and a list of contacted suppliers.</li> <li>– Date that product is needed (e.g. time of delivery or availability) to provide justification</li> <li>– Relevant excerpts from project plans, specifications, and permits indicating the required quantity and quality of construction materials</li> </ul> </li> <li>• Waiver request includes a statement from the prime contractor and/or supplier confirming the non-availability of the domestic construction materials for which the waiver is sought</li> <li>• Has the State received other waiver requests for the materials described in this waiver request, for comparable projects?</li> </ul>		



CHECKLIST FOR STATE ENGINEERS

Date \_\_\_\_\_ Project Name \_\_\_\_\_

Project Type: \_\_Water\_\_ Wastewater\_\_ Stormwater\_\_ Solid Waste

Applicant/Owner Name:

Project % Completion (*estimated*):

Total Project Cost:

Estimated Materials Cost:

<u>Items</u>	<u>Stored</u>	<u>OR</u>	<u>Installed?</u>	<u>US Made (Y/N)/Manufacturer Name</u>
Ductile Iron Pipe	<input type="checkbox"/>		<input type="checkbox"/>	_____
Reinforced Conc. Pipe	<input type="checkbox"/>		<input type="checkbox"/>	_____
Other Steel Pipe	<input type="checkbox"/>		<input type="checkbox"/>	_____
Fittings	<input type="checkbox"/>		<input type="checkbox"/>	_____
Valve Boxes	<input type="checkbox"/>		<input type="checkbox"/>	_____
Hydrants	<input type="checkbox"/>		<input type="checkbox"/>	_____
Valves	<input type="checkbox"/>		<input type="checkbox"/>	_____
Fittings/Bends/etc.	<input type="checkbox"/>		<input type="checkbox"/>	_____
Manholes	<input type="checkbox"/>		<input type="checkbox"/>	_____
Manhole Frames/Covers	<input type="checkbox"/>		<input type="checkbox"/>	_____
Other Municipal Castings	<input type="checkbox"/>		<input type="checkbox"/>	_____
Detection Plates	<input type="checkbox"/>		<input type="checkbox"/>	_____
Grates	<input type="checkbox"/>		<input type="checkbox"/>	_____
Manholes/Precast Conc.	<input type="checkbox"/>		<input type="checkbox"/>	_____
Steel Roofing Materials	<input type="checkbox"/>		<input type="checkbox"/>	_____
Steel Doors & Frames	<input type="checkbox"/>		<input type="checkbox"/>	_____
Steel Tanks/Pressure Vessels	<input type="checkbox"/>		<input type="checkbox"/>	_____
Reinforcing Bar/Wire	<input type="checkbox"/>		<input type="checkbox"/>	_____
Steel Stairs/Catwalks/Railings	<input type="checkbox"/>		<input type="checkbox"/>	_____
Unknown Iron/Steel Item	<input type="checkbox"/>		<input type="checkbox"/>	_____

Deminimis Waiver

General contractor maintains an itemized list of incidental components and the cost is less than 5% of total materials cost for project. YES  NO

Minor Components Waiver

General contractor maintains a list of products to which the minor components waiver applies and the cost of the non-domestically produced component is less than 5% of total materials cost of that product. YES  NO

Project Specific Waiver

Is there an approved waiver for this project? Is so, please list. YES  NO   
 Inconsistent with public interest YES  NO   
 Not produced in U.S. in sufficient and reasonable available quantities or of a satisfactory quality. YES  NO   
 Cost of the overall project increased by more than 25%. YES  NO

Miscellaneous

Is there a project file that includes all manufacturers' certifications on site? If yes, please review the project file for compliance. YES  NO

This inspection form was prepared by:

\_\_\_\_\_

(Print and sign name)

Consulting Engineer/RPR present (If yes, print name):

General Contractor present (If yes, print name):

Owner/Applicant present (If yes, print name):

Others (If yes, print name):

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## **D. TECHNICAL SPECIFICATIONS**

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## TECHNICAL SPECIFICATIONS

Section 01010	General Requirements
Section 01020	Mobilization
Section 02010	Demolition
Section 02020	Clearing and Grubbing
Section 02030	Erosion and Sediment Control
Section 02410	Chain Link Fencing
Section 02420	Grass Establishment
Section 02510	Driveway Earthwork
Section 02520	Hot Mix Asphalt
Section 02600	Water Mains
Section 02610	Earthwork for Utilities
Section 02620	Directional Drilling of Water Mains
Section 02630	Waterline Casings
Section 02640	Water Services
Section 02650	Tapped Connections for Water Mains
Section 02660	Gate Valve Assemblies
Section 02670	Fire Hydrant Assemblies
Section 02680	Testing for Pressure Piping
Section 02690	Grouting of Waterlines
Section 02800	Chlorination Pump
Section 02820	Master Meters
Section 02900	Duplex Booster Pump Unit
Section 02910	Hydropneumatic Tank
Section 02920	Collector Tank
Section 13200	Project Sign
Section 16100	Basic Electrical Materials and Methods
Section 16110	Water Well Pump Control
Section 16120	SCADA Systems
Section 16130	Variable Frequency Drives
Section 16140	Booster Station Controls

SECTION 01010  
GENERAL REQUIREMENTS

PART 1 – GENERAL

1.01 SCOPE

This specification sets out a general summary of the work, general requirements and information pertinent to the execution of the Contract.

1.02 LOCATION AND OWNER

The work location is at designated areas inside the certificated area of Rawls Springs Utility District.

1.03 ENGINEER

The Engineer for the project is W Engineering, P.A., Wiggins, Mississippi. The Project Engineer is Hollis S. "Pete" Williams, P.E., P.S.

1.04 ENDANGERED PLANTS AND ANIMALS

This project involves construction in the Rawls Springs Utility District and in the Expansion Area in Covington County. The project area may have endangered plants or animals. However, no impact is known at this time. The Contractor shall notify the Engineer immediately if there is any reason to suspect an impact to endangered plants or animals. After notification the Contractor shall await instructions from the Engineer as to whether work should proceed or any action may be needed.

1.05 PROJECT FINANCING

Funding for this project will be provided by a loan from the USDA Rural Development program. The Contractor shall comply with all program requirements.

1.06 EASEMENTS, RIGHTS OF WAY, PERMITS

The facilities to be constructed under this project will be located on property owned by the Rawls Springs Utility District or on property for which easements have been obtained or owned by prescription or use.

The Contractor shall be responsible for obeying all laws regarding burning and/or water pollution. The Contractor shall acquire and pay the cost of all permits required for this project.

1.07 MEASUREMENT AND PAYMENT

Measurement and payment shall be made at the contract Unit Prices as set out on the Bid Form and described in that section of specifications.

It is the intention of these plans and specifications to describe a complete, functional product. All labor, equipment, supplies or materials which is necessary for a complete, fully functional, workmanlike job and which is not specifically shown or called out shall be considered a subsidiary item of this contract. Compensation for such incidental items shall be considered as included in the items for which payment is made.

#### 1.08 REFERENCED STANDARDS

Whenever published standards are referenced in these specifications, the latest edition of such standard shall govern. In case of a conflict between the referenced specification or standard and the contract specifications, the more stringent shall govern unless otherwise relieved by the Engineers.

#### 1.09 USED MATERIAL AND EQUIPMENT

All materials and equipment incorporated into the work shall be new and in new condition. All materials and equipment indicated on the drawings shall be new, unused and undamaged. Plastic products such as PVC pipe that is faded, weathered or otherwise impacted by exposure to the weather shall be considered damaged and unsuitable for use. The only case where used material will be allowed is where specifically indicated on the drawings by use of the words "reuse", "relocate existing", "installed used" or "connect to existing".

#### 1.10 MATERIAL AND EQUIPMENT REMOVED FROM SERVICE

All existing material and equipment that is removed from service shall remain property of its original owner and shall be removed from the project site by the Contractor and delivered to a location within 5 miles as designated by the Owner. The Owner shall have the option of relinquishing ownership of material and equipment at the project site in which case the relinquished items shall become property of the Contractor. Such items shall be removed from the project site and stored or disposed of in a suitable manner.

#### 1.11 MATERIAL AND EQUIPMENT SPECIFICATIONS

Where brand names and catalog numbers are used in these specifications or on the drawings, they are used to establish the quality of the material or equipment being specified. Material or equipment of other manufacturers may be used if it is proved that they are equal or superior to the quality-establishing brand, and the request for approval is submitted as prescribed. Request for substitution shall be submitted in writing. Informal requests for approval by sales representatives will not be considered.

#### 1.12 SUBMITTALS

As soon as practicable and within 30 days after the date of award of the contract and before any materials or equipment is purchased, the contractor shall submit for approval a complete schedule, in triplicate, of the materials and equipment showing the brand name and catalog number which the Contractor purposes to furnish, and manufacturer's brochures giving descriptive data, cuts, diagrams, technical data and such other information as required to appraise the product. Brochures shall be submitted on all items whether the Contractor proposes to furnish the quality-establishing brand or an equal, except that brochures need not be furnished on standard construction material.

#### 1.13 WATER MAIN LAYOUT

The Contractor shall contact "One Call" prior to water line construction. After existing utilities have been marked the Contractor shall indicate the proposed location of proposed water lines using white pin flags and white marking paint. After marking has been completed the Contractor shall request that the Engineer review the proposed location. After observing the proposed location the Engineer shall issue written direction to proceed or adjust the proposed route. The

Contractor shall not proceed with water main construction without written authorization from the Engineer.

#### 1.14 SITE LAYOUT AND BENCH MARKS

The OWNER has provided a bench mark with elevation at each well site as shown on the project plans. The Contractor shall be responsible for construction staking at each well site to lay out work and to construct the work in accordance with the horizontal and vertical requirements on the plans.

#### 1.15 TESTING

The Contractor shall perform all testing as required by the Contract Specifications and by regulations. The Contractor shall also perform any additional testing which he shall deem necessary. All testing shall be paid for by the Contractor. The OWNER shall procure and pay for any testing services the Owner deems necessary.

#### 1.16 BARRICADES AND WARNING SIGNS

The Contractor shall provide, erect and maintain all necessary barricades, suitable and sufficient lights, signs and other traffic control devices. He shall take all precautions to protect the safety of the public including flagmen if necessary.

#### 1.17 EROSION CONTROL

Contractor shall utilize the Best Management Practice (BMP) erosion controls (i.e. Silt fence, wattles, staked hay bails, etc.) to meet all federal, state, and local requirements and to the satisfaction of the Engineer.

#### 1.18 PROTECTION OF EXISTING FACILITIES

The Contractor shall provide the necessary protection to prevent damage, injury or loss to other property at the site or adjacent thereto, including above the ground and underground utilities, not designated for removal, relocation, or replacement in the course of the construction. Any property damaged by the Contractor shall be repaired or replaced by the Contractor to the satisfaction of the particular facility owner at no cost to the owner. Where underground utilities are shown on the plans, such information is based on information furnished by reliable parties; however, the Engineer does not guarantee the accuracy of such information nor does the Engineer claim to have shown all the utility lines which may affect the Contractor's operation.

#### 1.19 OPERATION OF EXISTING UTILITIES

Existing utilities shall only be operated by the utility owner's personnel or by those authorized by the utility owner. The Contractor shall coordinate work with the utility system's personnel when utility system operation is required for project construction.

#### 1.20 INTERRUPTION OF EXISTING UTILITIES

The Contractor shall not be allowed to interrupt the function of sewer, natural gas, electric, and communication systems. The Contractor shall be allowed to temporarily interrupt water service in a small, isolated area if absolutely necessary to cut and cap or cut and valve existing water lines. Water outages shall be scheduled over 48 hours in advance unless some unforeseen condition prevents such scheduling. The Contractor shall provide written notice of

scheduled water outages over 2 hours in length. No water outages shall be allowed to continue over 8 hours.

Written notice of water outages shall consist of door hangers containing the following items:

1. Project Title
2. Statement explaining that water service will be interrupted to construct water system improvements.
3. Time and date for the beginning and end of the scheduled outage
4. Contractor's telephone number

The Contractor shall give a door hanger to the local law enforcement department, fire department Dept. and shall place a door hanger on the doors of all households likely to be impacted by the water outage.

The Contractor shall operate water valves as required to isolate the portion of the water system where notice of an outage has been provided. The Contractor shall be responsible for any and all damage caused by improper operation of water valves and /or fire hydrants.

#### 1.21 INTERRUPTION OF TRAFFIC ON PUBLIC ROADS

When absolutely necessary, the Contractor shall be allowed to remove a public roadway from service for tie ins to existing utility lines under pavement and other instances when pavement removal is required. The Contractor shall set up a detour route if a road is completely closed. If only one lane of a road requires closure, then the Contractor shall provide flagmen to control traffic. The Contractor shall furnish and properly place traffic control signage as required by the Manual of Uniform Traffic Control Devices, latest edition.

#### 1.22 MAINTENANCE OF PUBLIC ROADS

The Contractor shall take whatever measures are necessary to prevent mud, debris and any other items from being dropped or otherwise deposited on public right-of-ways or any other paved surfaces. The Contractor shall immediately remove any such items that were deposited as a result of construction activities. The Contractor shall reimburse the cost of restoring the right-of-way to its condition prior to construction in the event that a potentially unsafe condition is created as a result of the Contractor's activities.

#### 1.23 REMOVAL AND DISPOSAL OF STRUCTURES AND OBSTRUCTIONS

The Contractor shall remove and dispose of all existing buildings, debris or vegetative matter encountered within designated work area.

#### 1.24 MAINTENANCE DURING CONSTRUCTION

The Contractor shall maintain the work until released from maintenance. This maintenance shall constitute continuous and effective work prosecuted day by day with adequate equipment, forces, and material to the end that all features of the work are kept in satisfactory condition at all times.

All cost of maintenance of the work shall be included in the lump sum bid amount for such work except as otherwise provided in the contract.

#### 1.25 RECORD DRAWINGS

In addition to the construction plans, one set of prints will be made available to the Contractor for making and noting changes during construction. The Contractor shall then mark up the plans to indicated as-built conditions. This shall be done on a routine basis to show all changes in the work and depict actual installed locations. Depths and sizes of underground items shall be noted with reference to landmarks at sufficient frequency to allow future excavation of constructed items. Changes shall be made neatly in red ink and of equal appearance on a single set of prints. Final payment will not be made until acceptable record drawings have been submitted.

#### 1.26 PROJECT START UP

Each item of equipment shall be tested to identify all defects, make all necessary adjustments, and demonstrate that each piece of equipment (both individually and in conjunction with other equipment) operates satisfactorily and produces the results that are specified and/or indicated. All tests and adjustments recommended by the manufacturers shall be made.

If any equipment or system does not operate properly, the Contractor shall immediately replace or repair components until it operates properly. Upon completion of individual equipment and system testing, the Contractor shall satisfactorily operate the new improvements for a period of 15 consecutive calendar days prior to final acceptance.

When the equipment is placed in operation, the Contractor shall demonstrate to the Owner's personnel the proper manner of operating the equipment, making adjustments and maintaining the system. Likewise, the Contractor shall provide the City a complete operation manual.

#### 1.27 FINAL CLEAN UP

Before final acceptance, the project, including all areas disturbed by the Contractor, shall be cleaned of all rubbish, excess materials, temporary structures and equipment. The site shall be graded to drain and all parts of the work left in an acceptable condition.

#### 1.28 ABBREVIATIONS

Wherever the following abbreviations are used, with or without periods, in these specifications or other contract documents, they are to be construed the same of the respective expressions represented:

A.A.S.H.T.O. - American Association of State Highway Officials (Formerly  
A.A.S.H.O. - American Association of State Highway  
Officials)

A.A.S.H.O. - American Association of State Highway Officials

A.C.I. - American Concrete Institute

A.I.A. - American Institute of Architects

A.I.S.C. - American Institute of Steel Construction

A.I.S.I. - American Iron and Steel Institute

A.I.T.C. - American Institute of Timber Construction

A.N.S.I. - American National Standards Institute

A.S.L.A. - American Society of Landscape Architects  
A.S.T.M. - American Society for Testing and Materials  
A.W.G. - American Wire Gauge  
A.W.P.A. - American Wood Preservers Association  
A.W.S. - American Welding Society  
A.W.W.A. - American Water Works Association  
B.P.C.-Bureau of Pollution Control  
Code (N.E.C.) - National Electrical Code  
C.L.F.M.I. - Chain Link Fence Manufacturers Institute  
C.R.S.I. - Concrete Reinforcing Steel Institute  
C.S. - Commercial Standards, U. S. Department of Commerce  
DEQ - Mississippi Department of Environmental Quality  
DMR - Mississippi Department of Marine Resources  
EPA - Environmental Protection Agency  
F.H.W.A. - Federal Highway Administration  
F.M. - Final Measure in cubic yards by the average and area method computed from original and final cross sections of the material in its original position.  
F.P.M. - Final Position Measure - earthwork in cubic yards by the average end area method computed from original and final cross sections of the material in its final position complete-in-place and accepted.  
F.S.S. - Federal Specifications and Standards, General Services Administration  
HUD - U. S. Department of Housing and Urban Development  
Hz - Hertz  
I.D. - Inside Diameter  
I.P.C.E.A. - N.E.M.A. - Insulated Power Cable Engineers Association; National Electrical Manufacturers Association  
I.P.S. - Interior Pipe Size  
L.V.M. - Volumes of material measured in its loose condition in approved hauling vehicles.  
M.D.O.T. - Mississippi Department of Transportation  
M.S.D.H. - Mississippi State Department of Health  
M.S.G. - Manufacturers Standard Gauge  
M.U.T.C.D. - Manual on Uniform Traffic Control Devices  
N.B.C. - National Building Code  
N.E.C. - (Code) - National Electrical Code  
N.P.C. - National Plumbing Code

N.S.F. - National Sanitation Foundation

O.D. - Outside Diameter

P.C.I. - Prestressed Concrete Institute

P.M. - Plan Measure - Whenever the excavation is completed in accordance with the lines, grades and sections shown on the original plans, the plan measure shall be considered final.

S.N.A.F.U. – Situation Normal All Fouled Up

S.S.P.C. - Steel Structures Painting Council

U.L. - Underwriter Laboratories, Inc.

USDA-RUS - United States Department of Agriculture - Rural Utilities Service  
(formerly Farmers Home Administration)

#### 1.29 TERMINOLOGY

For the purpose of this contract, the terms water main, water line and waterline are interchangeable and mean the same thing.

END OF SECTION

FOR VIEWING ONLY  
NOT FOR BIDDING PURPOSES



SECTION 01020  
MOBILIZATION

PART 1 - GENERAL

1.01 DESCRIPTION

Mobilization shall consist of moving all labor, equipment, supplies and incidentals to the project site and removing same after other work under the contract has been completed. It also includes all mobilization pre-construction costs exclusive of bidding costs, which are necessary direct costs to the project and are of a general nature rather than directly attributable to other pay items. Mobilization shall also include preliminary incidental construction work needed to support the construction of bid items such as setting up a material storage area or equipment parking area.

1.02 INITIATION

Under no circumstances shall any mobilization begin at the site before the Owner issues a written notice to proceed.

PART 2 - PRODUCTS

None.

PART 3 - EXECUTION

None.

PART 4 – MEASUREMENT AND PAYMENT

4.01 METHOD OF PAYMENT

Mobilization and demobilization shall be paid for at the lump sum bid amount according to the following percentages.

- A. When one percent of the original contract amount is earned from other bid items 10 percent of the amount bid for mobilization, or one (1) percent of the original contract amount, whichever is lesser, will be paid.
- B. When five percent of the original contract amount is earned from other bid items 50 percent of the amount bid for mobilization, or two (2) percent of the original contract amount, whichever is lesser, will be paid.
- C. When 10 percent of the original contract amount is earned from other bid items 100 percent of the amount bid for mobilization, or four (4) percent of the original contract amount, whichever is lesser, will be paid.
- D. Upon completion and acceptance of all work on the project, payment of any amount bid for mobilization in excess of four (4) percent of the original contract amount will be paid.
- E. In the event the contract is terminated, the above percentages will not be used in computing mobilization payment. Instead the percentage of the total mobilization bid amount shall be equal to the percentage of the original contract amount earned at the time of termination.

END OF SECTION

SECTION 02010  
DEMOLITION

PART 1 - GENERAL

1.01 SCOPE

This work shall consist of the demolition of sheds, fencing, master meters, control panels and any other items that must be removed to construct the improvements at the well sites on this project. Removal of water lines shall be covered in the waterline section of these specifications.

PART 2 - MATERIALS

Not applicable

PART 3 - EXECUTION

3.01 BUILDINGS AND SHEDS

Portable sheds and skid mounted buildings designated for demolition shall be removed from the project site. Buildings with concrete foundations shall be demolished above the slab with the slab remaining intact. Buildings supported by pilings, columns or piers shall be demolished so that no portion of the building or foundation remains within three feet of the surface of the ground.

3.02 DISPOSAL

Contractor is responsible for removing all material from the site. Burning on the project site shall not be allowed. The Contractor shall haul and dispose of debris at a suitable location in a manner that complies with all applicable local, state and federal regulations.

PART 4 - MEASUREMENT AND PAYMENT

4.01 DEMOLITION, POST CONSTRUCTION CLEANUP AND GRASSING

Demolition of sheds, fencing, master meters, control panels and any other items that must be removed to construct the improvements shall be measured on a "lump sum" basis at Tank Site 1 and on a "lump sum" basis at Tank Site 2. This lump sum pay item shall also include grading, seeding, fertilizing and mulching all disturbed area to establish full grass coverage. Post construction cleanup consisting of the removal of all debris and extraneous material shall also be included in this pay item.

END OF SECTION

SECTION 02020  
CLEARING AND GRUBBING

PART 1 - GENERAL

1.01 SCOPE

Clearing and grubbing shall include cutting trees, removing brush, grubbing roots, removing stumps, trimming limbs, removing all debris from the project site and all other associated activities required to produce a cleared, smooth and grubbed area suitable for construction. Included is the removal and disposal of all debris.

PART 2 - MATERIALS

Not applicable

PART 3 - EXECUTION

3.01 GENERAL

In the areas approved for clearing and grubbing, contractor must remove all trees or vegetation not marked for preservation. And also, contractor must remove all snags, logs, shrubs, stumps, roots, and other deleterious material. Unless otherwise specified, all stumps, roots and root clusters shall be grubbed out and removed from the project site.

All stump holes shall be backfilled with select granular backfill if not within foundation or paving limits. Such backfill shall be compacted to at least 85% Standard Proctor density or as specified elsewhere if within foundation or paving limits.

3.02 LIMB TRIMMING

As site conditions dictate, the Contractor shall trim low hanging, unsightly or unsound branches from the trees or selected vegetation designated to be preserved. And also, contractor shall trim all limbs from adjacent properties that hang over the owner's property. All trimming shall be done in accordance with accepted horticultural practices including smooth cuts flush against trunk or branch and the painting of cut surfaces with an approved asphaltum based paint specifically prepared for such purposes.

3.03 ROAD RIGHT OF WAY

The limits of the areas to be cleared in road right of way shall be the area shown on the plans or, if not shown, the overgrown area within easements and rights of way that interferes with construction. Prior to starting the clearing operation, the Contractor shall clearly mark the limits of the area to be cleared with roll flagging or white paint. When the marking is complete, the Contractor shall notify the Engineer who will make a field inspection and approve the quantity for payment or determine if any adjustments in the clearing limits are necessary. Structures, trees or vegetation selected for preservation shall be clearly marked in a manner to be agreed upon by the Contractor and the Engineer

### 3.04 DISPOSAL

Contractor is responsible for removing all material from the site. Burning on the project site shall not be allowed. The Contractor shall haul and dispose of debris at a suitable location in a manner that complies with all applicable local, state and federal regulations.

### 3.05 SALVAGE

If owner desires any items to be salvaged, the contractor shall disassemble them and remove to a location designated by the Engineer.

### 3.06 PRESERVATION OF TREES

All trees or selected vegetation within the clearing area, which are designated to remain, shall be protected by the Contractor. Use of methods of equipment which may damage the trees shall not be permitted. In event damage does occur, the Contractor shall be required to employ a tree surgeon satisfactory to the Engineer to repair such damage. Piling of dirt or clearing debris within the branch spread of a tree shall not be permitted.

If certain trees are specifically shown on the plans as requiring protection, the Contractor shall erect a barricade around such trees and remove such barricade when the work is complete.

## PART 4 - MEASUREMENT AND PAYMENT

### 4.01 CLEARING AT TANK SITES

Clearing and grubbing at the tank sites shall not be measured for separate payment but shall be subsidiary to bid items that require clearing and grubbing for proper construction.

### 4.02 CLEARING AT BOOSTER PUMP STATION

Clearing and grubbing at the booster pump station site shall be measured on a "per acre" basis and shall include clearing and grubbing the entire site.

### 4.03 CLEARING ON ROAD RIGHT OF WAY

Clearing and grubbing the portion of road right of way that has been overgrown and designated for clearing on the drawings or approved by the Engineer shall be measured on a "per acre" basis.

END OF SECTION

SECTION 02030  
EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

- 1.01 Description This work consists of furnishing, constructing and maintaining baled hay or straw erosion checks and silt fence for the retention of soil along the toe of fill slopes, around inlets, swale areas, small ditches, sediment basins and other areas in accordance with the State of Mississippi Department of Environmental Quality Planning & Design Manual for the Control of Erosion, Sediment and Stormwater, latest edition. Also, the work includes removing and disposing of the erosion checks and silt accumulations.

PART 2 - PRODUCTS

- 2.01 Hay Bales - Baled hay or straw material (Type I or II) shall be rectangular in shape with a minimum length of 32 inches and shall meet the requirements of 715.05, Mississippi Standard Specifications for Road and Bridge Construction, latest edition.
- 2.02 Wooden Stakes - Wooden stakes for hay bales, wattles and silt fence shall be approximately 2" X 2" X 34" southern pine or other wood of similar strength.
- 2.03 Silt Fence - All materials used for silt fences shall conform to the requirements of ASTM Specification D 6461.

PART 3 – EXECUTION

- 3.01 General - Erosion controls shall be constructed in accordance with the State of Mississippi Department of Environmental Quality Planning & Design Manual for the Control of Erosion, Sediment and Stormwater, latest edition and the requirements of these specifications.
- 3.02 Construction Sequence for Erosion Controls - Erosion controls required along the toe of fill slopes, drainage structures, and points of outfall shall be constructed prior to grading and/or fill operations at the site. For other locations, the erosion checks shall be constructed as required to adequately control erosion.
- 3.03 Silt Fencing – All silt fencing shall comply with ASTM D 6462–03 and the project erosion control details if such are contained in the project drawings.
- 3.04 Hay Bale Barriers - When constructing hay bale barriers, the soil shall be excavated at least three inches in depth to embed the baled material. After securing in place, a sufficient quantity of the excavated material shall be placed around bales and compacted to prevent undermining.
- 3.05 Maintenance and Removal - The Contractor shall maintain the temporary erosion controls throughout the period of time that soil remains unstable. After soil stabilization the Contractor shall remove and dispose of silt accumulations as necessary, remove the temporary erosion controls and establish grass in any

areas disturbed by the removal of the controls.

PART 4 – MEASUREMENT AND PAYMENT

- 4.01 Erosion and Sediment Control shall not be measured for separate payment but shall be a subsidiary item to bid items requiring excavation and land disturbance.

END OF SECTION

FOR VIEWING ONLY  
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SECTION 02410  
CHAIN LINK FENCING

PART 1 - GENERAL

1.01 SCOPE

This work shall consist of furnishing and erecting a chain-link fence in accordance with these specifications and the details shown on the plans and in conformity with the lines and grades shown on the plans or established by the Engineer.

1.02 SPECIFIED ELSEWHERE

Section 02010	Demolition
Section 02020	Clearing and Grubbing

PART 2 - MATERIALS

2.01 FENCE FABRIC

Fence fabric shall be woven with a 9-gauge galvanized steel wire in a 2 in (50 mm) mesh and shall meet the requirements of ASTM A392 Class 2, 2.0 ounces zinc coating per square foot. Each roll of fabric shall have a tag indicating that the product is 9 gauge galvanized steel ASTM A392 Class 2 coating.

2.02 POSTS, RAILS AND BRACES

Line posts, rails, and braces shall conform to the requirements of ASTM F-1043 or ASTM F 1083. Galvanized tubular steel pipe shall conform to the requirements of Group IA, (Schedule 40) with coatings conforming to Type A, or Group IC ( High Strength Pipe), External coating shall be Type B, and internal coating Type B or D.

Posts, rails and braces shall be identified as to manufacturer, kind of base metal and kind of coating.

2.03 BARBED WIRE

Barbed wire shall be 2-strand 12-1/2 gauge zinc-coated wire with 4-point barbs and shall conform to the requirements of ASTM A 121, Class 3, Chain Link Fence Grade.

2.04 TENSION WIRE

Wire ties for use in conjunction with a given type of fabric shall be of the same material and coating weight identified with the fabric type. Tension wire shall be 7-gauge marcelled steel wire with the same coating as the fabric type and shall conform to ASTM A 824.

2.05 FITTINGS AND HARDWARE

Miscellaneous steel fittings and hardware for use with zinc-coated steel fabric shall be of commercial grade steel or better quality, wrought or cast as appropriate to the article, and sufficient in strength to provide a balanced design when used in conjunction with fabric posts, and wires of the quality specified herein. All steel fittings and hardware shall be protected with a zinc coating applied in conformance with ASTM A 153. Barbed wire support arms shall withstand a load of 250 pounds (113 kg) applied vertically to the outermost end of the arm.

## 2.06 CONCRETE

Concrete shall have a 28-day compressive strength of at least 2500 psi.

## PART 3 - EXECUTION

### 3.01 POSTS

The concrete shall be thoroughly compacted around the posts by tamping or vibrating and shall have a smooth finish slightly higher than the ground and sloped to drain away from the posts. All posts shall be set plumb and to the required grade and alignment. No materials shall be installed on the posts, nor shall the posts be disturbed in any manner within 7 days after the individual post footing is completed.

### 3.02 TOP RAILS

The top rail shall be continuous and shall pass through the post tops. The coupling used to join the top rail lengths shall allow for expansion of the top rails.

### 3.03 BRACING

Horizontal brace rails, with diagonal truss rods and turnbuckles, shall be installed at all terminal posts.

### 3.04 FENCE FABRIC

Fence fabric shall be firmly attached to the posts and braced in the manner shown on the plans. All wire shall be stretched taut and shall be installed to the required elevations. The fence shall generally follow the contour of the ground, with the bottom of the fence fabric no less than 1 inch (25 mm) or more than 2 inches (50 mm) from the ground surface. Grading shall be performed where necessary to provide a neat appearance.

At locations of small natural swales or drainage ditches and where it is not practical to have the fence conform to the general contour of the ground surface, longer posts may be used and multiple strands of barbed wire stretched thereon to span the opening below the fence. The vertical clearance between strands of barbed wire shall be 6 in (150 mm) or less.

### 3.05 ELECTRICAL GROUNDING

Electrical grounds shall be constructed where a power line passes over the fence. The ground shall be installed directly below the point of crossing. The ground shall be constructed using with a copper clad rod 8 ft (240 cm) long and a minimum of 5/8 in (15 mm) in diameter driven vertically until the top is 6 in (150 mm) below the ground surface. A No. 6 solid copper conductor shall be clamped to the rod and to the fence in such a manner that each element of the fence is grounded.

### 3.06 DEMOLITION OF EXISTING FENCE

Demolition and removal of the existing fence and gates is required and shall be completed as specified in the technical specification "Demolition".

### 3.07 CLEARING AND GRUBBING

Clearing and grubbing is required in the area of the proposed fencing and shall be completed as specified in the technical specification "Clearing and Grubbing"



## PART 4 - MEASUREMENT AND PAYMENT

### 4.01 CHAIN LINK FENCING

Chain Link fencing shall be measured for payment on a per linear foot basis. Measurement shall be horizontally along the fence line from center to center of corner posts or gate posts. The length occupied by gate openings, if present, will not be measured as fencing. Gates shall be a separate pay item.

Payment for chain link fencing shall be full compensation for furnishing all materials, ground preparation, erection, and installation of these materials, and for all labor equipment, tools, and incidentals necessary to complete the item. Clearing and grubbing shall also be included.

### 4.02 GATES

Gates where required shall be measured on a "per each" basis at their designated width and height. Payment shall include gate, hinges, cross bracing and all other items required for a complete and fully functional final product.

### 4.03 DEMOLITION OF EXISTING FENCE

There will be no extra payment for demolition of existing fence and gates. This work will be considered a subsidiary item to Demolition, Post Construction Cleanup and Grassing pay item for that particular site.

### 4.04 CLEARING AND GRUBBING FOR FENCING

There will be no extra payment for clearing and grubbing along the proposed fence and will be considered a subsidiary item to chain link fencing.

END OF SECTION

SECTION 02420  
GRASS ESTABLISHMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS : Mississippi Standard Specifications for the Construction of Roads and Bridges, latest edition, that shall be referred to as the "Standard Specifications". In the event of a conflict the specifications contained in this section shall take priority over the specifications contained in the following sections of the Standard Specifications.

Section 211	Topsoiling
Section 212	Ground Preparation
Section 213	Fertilizing
Section 214	Seeding
Section 215	Mulching
Section 219	Watering

1.02 DESCRIPTION OF WORK:

- A. Grass establishment is required on all disturbed areas within the limits of construction without paved or gravel surface or buildings.
- B. Fertilizing, Seeding and Mulching – All areas disturbed by construction shall be fertilized, seeded and mulched.

1.03 JOB CONDITIONS:

- A. The Contractor shall complete grass establishment as rapidly as portions of site become available in accordance with seasonal limitations for each kind of landscape work required.
- B. Planting Time - Plant or install materials during normal planting seasons for each type of seeding work required.

1.04 SPECIAL PROJECT WARRANTY: The Contractor shall warranty grass through project construction period until final acceptance of the project.

PART 2 - PRODUCTS

2.01 TOPSOIL:

All topsoil encountered in excavation and filling shall be excavated and stockpiled for re-use. If quantity of stockpiled topsoil is insufficient, provide additional topsoil as required to complete grass establishment work.

Provide, where required, topsoil which is fertile, friable, natural loan, surface soil, reasonably free of subsoil, clay lumps, brush, weeds and other litter and without roots, stumps, gravel, and other extraneous or toxic matter harmful to plant growth.

2.02 SOIL AMENDMENTS:

- A. Lime - Natural limestone containing not less than 85% of total carbonates, ground so that not less than 90% passes a 10 mesh sieve and not less than 50% passes a 100 mesh sieve. Lime used by farms in the vicinity and approved by the Mississippi Department of Agriculture is acceptable. **Apply at rate of not less than 2 tons/acre.**
- B. Commercial Fertilizer: Complete fertilizer of neutral character, with some elements derived from organic sources and containing following percentages of available plant nutrients, 13-13-13. Furnish in bags or with Certificate of Compliance and chemical analysis. **Apply at rate of not less than 250 pounds/acre.**
- C. Ammonium Nitrate shall conform to the requirements of the State of Mississippi Department of Agriculture. Furnish in bags or with Certificate of Compliance and chemical analysis. **Apply at rate of not less than 125 pounds/acre** - after the grass cover has established.

2.03 GRASS MATERIALS

A. Grass Seed

1. Provide fresh, clean, new crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide seed of grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified.

2. Seed Application Rate for Carpet Grass/Common Bermuda Mix

Carpet Grass Seed	30 lbs./acre
Common Bermuda Seed - hulled	30 lbs./acre
Add rye grass if between September and April	30 lbs./acre

2.04 MULCH

Straw material for mulch shall be classed as follows:

Class I. Approved baled wheat, oat, rice, or rye straw. The materials shall have been cured properly prior to baling and shall be reasonably free from obnoxious grasses and weeds. The straw material shall be reasonably bright in color, dry and shall not be musty, moldy, or of otherwise low quality.

Class II. Approved baled pine needles that are reasonably free of twigs, branches, and obnoxious grasses and weeds. The material shall be dry and shall not be musty, moldy, or of otherwise low quality.

All straw mulch shall be inspected and approved by the Engineer prior to its use. Apply at rate not less than 2 tons/acre.

## PART 3 EXECUTION

### 3.01 PREPARATION

#### A. Preparation for Planting

1. Loosen subgrade of areas to a minimum depth of 4". Remove stones over 1-1/2" in any dimension and sticks, roots, rubbish and other extraneous matter.
2. Spread topsoil to minimum depth of 3 inches to meet lines, grades and elevations shown, after light rolling and natural settlement. Place approximately one half of total amount of topsoil required. Work into top of loosened subgrade to create a transition layer and then place remainder of topsoil.
3. Apply lime immediately after application of topsoil, even though seeding may not be done until several months later. Spread evenly and incorporate in the top 2 to 3 inches of soil.
4. After the lime has been spread and incorporated into the soil, then spread fertilizer not more than two weeks in advance of seeding. Incorporate into the top 2 or 3 inches of soil. Top dress grass with Ammonium Nitrate during the maintenance period.
5. Grade areas to smooth, even surface with loose, uniformly fine texture. Roll and rake and remove ridges and fill depressions, as required to meet finish grades. Limit fine grading to areas which can be planted immediately after grading.
6. Moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.
7. Restore grassed areas to specified condition if eroded or otherwise disturbed after fine grading and prior to planting.

### 3.02 PLANTING

#### A. Seeding:

1. Do not use wet seed or seed which is moldy or otherwise damaged in transit or storage.
2. Sow seed using a spreader or seeding machine. Do not seed when wind velocity exceeds 5 miles per hour. Distribute seed evenly over entire area by sowing equal quantity in 2 directions at right angles to each other.
3. Sow not less than the quantity of seed specified or scheduled.
4. Rake seed lightly into top 1/8" of soil, roll lightly, and water with a fine spray.

B. Mulching

1. Equipment: Mulching equipment shall be capable of maintaining a constant air stream which will blow or eject controlled quantities of mulch in a uniform pattern.
2. Placement of Vegetative Mulch: Mulching shall be placed uniformly on designated areas within 24 hours following seeding unless weather conditions are such that mulching cannot be performed. Placement shall begin on the windward side of areas and from tops of slopes. In its final position the mulch shall be loose enough to allow air to circulate but compact enough to partially shade the ground and reduce erosion.

The baled material shall be loosened and broken thoroughly before it is fed into the machine to avoid placement of unbroken clumps.

3. Rates of Application and Anchoring Mulch: The rate of application of vegetative mulch shall be two tons per acre. The mulch shall be anchored by a crimping machine approved by the Engineer.

Where steep slopes or soil conditions are such that highly erodible conditions exist, the Engineer will require crimping at the time or immediately following the mulch placement.

3.03 MAINTENANCE

- A. Begin maintenance immediately after planting.
- B. Maintain grass by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, regrading and replanting as required to establish a smooth, acceptable sod, free of eroded or bare areas.
- C. Apply Ammonium Nitrate during the maintenance period.

3.04 CLEANUP AND PROTECTION

- A. During landscape work, keep pavements clean and work area in an orderly condition.
- B. Protect landscape work, paving, and materials from damage due to landscape operations, or operations by other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair or replace damaged landscape work as directed.

3.05 INSPECTION AND ACCEPTANCE

- A. When landscape work is completed, including maintenance, Engineer will, upon request, make an inspection to determine acceptability, but not prior to date of substantial completion of project.

- B. Where inspected landscape work does not comply with requirements, replace rejected work and continue specified maintenance until reinspected by Engineer and found to be acceptable.

#### PART 4 – MEASUREMENT AND PAYMENT

##### 4.01 GRASS ESTABLISHMENT

Payment for grass establishment shall not be measured for separate payment but shall be included in a lump sum price for multiple site work items. This pay item shall include final grading to produce a smooth, even grade. This pay item shall also include seeding, fertilizing, mulching, watering as required to establish full grass coverage. The Contractor shall pay for all water used to water grass if such water is obtained from a metered water system.

END OF SECTION

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SECTION 02510  
DRIVEWAY EARTHWORK

PART 1 - GENERAL

- 1.01 SCOPE: This work consists of furnishing granular materials and the construction of one or more layers of subbase, base, shoulders, aggregate roadway or other required construction on a prepared foundation in reasonably close conformity with the lines, grades, and typical cross sections shown on the plans or established by the Engineer.

PART 2 - PRODUCTS

- 2.01 SELECT GRANULAR MATERIAL: Select granular material shall be clean, granular material free of roots and extraneous material with no more than 10% passing the No. 200 sieve.
- 2.02 CRUSHED LIMESTONE: Crushed limestone granular base shall conform to the requirements of MDOT A-610 roadway base material and foundation material.

PART 3 - EXECUTION

- 3.01 EQUIPMENT: Rollers shall be of sufficient number, type, size, and weight to accomplish the required compaction. Watering equipment shall have pressurized spray bars with suitable nozzle openings.
- 3.02 GRADE PREPARATION: The foundation on which granular material is to be placed shall be prepared as set out in Section 321, Mississippi Standard Specifications for Road and Bridge Construction, latest edition.
- 3.03 PLACING MATERIALS: The Contractor shall be responsible for furnishing a material that meets the requirements of the contract and in such quantity to produce the specified compacted thickness. All material placed in excess of the tolerances allowed in Section 321 shall be removed and placed at other approved locations or removed and hauled off the project without compensation. A layer whose compacted thickness is designated to be more than eight inches shall be constructed in two or more layers of approximately equal thickness. The maximum compacted thickness of any one layer shall not exceed eight inches.
- 3.04 UNSUITABLE CONDITIONS: No granular materials shall be placed while frozen or placed on frozen materials. When the in-place material, including the top portion of the design soil, is wet to the degree that there is a possibility of rutting, deforming, or displacing the underlying material, the hauling operation shall be suspended.
- 3.05 CORRECTIVE ACTION: The Contractor shall produce such material as is necessary to meet the specifications for gradation, liquid limit and plasticity index and shall make such corrections as are necessary or shall remove and replace, at no additional cost to the Owner, any deficient material placed in the work. In all cases of correcting deficiencies on the roadbed, the Contractor shall be fully

responsible for any damage to the underlying layer(s) and other work.

- 3.06 **BLENDING:** No blending shall be required for aggregate roadways. The following specifications shall apply to granular base and subbases. After the material has been initially shaped, the entire volume of material for the layer being placed shall be processed and blended by blading in such a manner and as many times as necessary to produce a layer visually uniform in color and texture. Care shall be exercised during the blending process to prevent contamination with underlying material. The Contractor shall be fully responsible for damage or contamination with underlying or other material and shall make corrections as necessary at no additional cost to the Owner.

When granular material is required to be placed adjacent to pavement in place, blending shall be performed to the satisfaction of the Engineer prior to placement of the material on shoulders.

- 3.07 **SHAPING AND COMPACTING:** Each layer shall be shaped to the required section, watered or aerated as necessary to provide the needed moisture content for compaction, and compacted. Throughout the compaction operation, the shape of the layer shall be maintained by blading and rolling so that the aggregates are uniformly distributed and firmly keyed.

Shaping and compaction shall be carried out in a manner that will prevent lamination and shall continue until the entire depth and width of the layer has reached the required density. Surface compaction and finishing shall be performed to produce a smooth, closely knit surface that is free from lamination, cracks, ridges or loose material.

- 3.08 **FINISHING:** The finished surface shall conform (within allowable tolerances) to the required section and established lines and grades. Allowable tolerances are set out in Section 321, of Mississippi Standard Specifications for Road and Bridge Construction, latest edition.

Prior to subsequent construction all irregularities, depressions, soft spots, and other deficiencies shall be corrected to meet the requirements of these specifications. After compaction and finishing, if the mixture contains plus No. 4 aggregate and the layer is to serve as a base for bituminous pavement, at least one complete coverage shall be made with a steel wheel roller. The resulting surface shall be sprinkled as necessary to maintain the required moisture content and shall be thoroughly compacted and sealed with a pneumatic roller.

In addition to the requirements for density and correction of deficiencies, the Contractor shall be responsible for constructing and maintaining a layer which will remain firm and stable under construction equipment and other traffic which the layer will be subjected to prior to project completion.

- 3.09 **DENSITY:** Density test will be performed in accordance with the methods as provided in 700.03 and 700.04, Mississippi Standard Specifications for Road and Bridge Construction, latest edition.



PART 4 – MEASUREMENT AND PAYMENT

4.01 OPEN CUT AGGREGATE DRIVEWAY REPAIR

Aggregate Driveway Repair shall be measured for payment on a “per linear foot” basis. The length of the aggregate driveway repair shall be measured along the centerline of the waterline trench from edge to edge of the aggregate driveway.

4.02 AGGREGATE DRIVEWAY CONSTRUCTION

Aggregate driveway construction at Tank Site 2 and also at the Booster Pump Station shall be measured on a per square yard basis.

4.03 GRANULAR BASE FOR OPEN CUT ASPHALT DRIVEWAY REPAIR

See Technical Specification for Hot Mix Asphalt. Granular base for open cut asphalt driveway repair shall not be measured for separate payment. The cost of granular base underneath pavement shall be included in the cost of open cut asphalt driveway repair.

4.04 EARTHWORK FOR DRIVEWAYS AND DITCHES

Earthwork for driveways and ditches at Tank Site 2 shall be measured on a lump sum basis. Earthwork for driveways and ditches at the Booster Pump Station shall be measured on a lump sum basis.

END OF SECTION

FOR VIEWING ONLY  
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SECTION 02520  
HOT MIX ASPHALT

PART 1 – GENERAL

1.01 SCOPE: This work consist of furnishing and constructing asphalt pavement from Hot Mix Asphalt on a prepared base either granular or existing pavement.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Hot Mix Asphalt shall conform to the requirements of the Mississippi Department of Transportation's *Standard Specifications for Road and Bridge Construction, 2004 Edition for "Hot Bituminous Pavement"* as set out in Section 403.
- B. Asphalt for Tack Coat shall conform to the requirements of the Mississippi Department of Transportation *Standard Specifications for Road and Bridge Construction, latest edition for "Tack Coat"* as set out in Section 407 of the MDOT *Standard Specifications for Road & Bridge Construction, latest edition*.
- C. Striping and Markings shall conform to the requirements of the Mississippi State Highway Department's *Standard Specifications for Road and Bridge Construction, latest edition for Road & Bridge Construction, latest edition*, for "Pavement Marking Material" as set out in Section 720.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Job Mix Formula - At least 15 days prior to placement of any asphalt pavement, the contractor shall submit a job mix formula to the Engineer for tentative approval. The mix formula shall be developed by an independent testing laboratory approved by the Engineer,
- B. Placement of the asphalt shall not commence until the base course or existing surface has been accepted. In case of an overlay, placement of asphalt shall not be made until the existing surface has been accepted by the Engineer.
- C. Application Rate for tack coat must be approved by the Engineer prior to placement.

3.02 CONSTRUCTION

- A. Overlay - The surface which is to be overlaid shall be thoroughly swept to remove dirt, grass, and all loose material, shall be repaired, and, if required, leveled before the overlay is placed. The granular base shall be primed with asphalt prior to asphalt placement unless directed otherwise by the Engineer. If an asphalt prime coat is not required by the Engineer, the granular base shall be swept, moistened and/or rolled to ensure that no loose or dry material exists on the surface of the granular base. This shall be done immediately prior to placement of the pavement,

Pavement Preparation - On areas to be overlaid the edges of the existing pavement shall be hard bladed to remove grass and surplus dirt while preserving the pavement underneath.

Prior to placing of overlay the surface being overlaid shall be thoroughly broomed and blown to remove all deleterious material.

A Tack Coat shall be applied uniformly over the entire paved surface to be overlaid. A pressure distributor shall be used to apply tack coat immediately prior to placement of the overlay.

Where the pavement is to be widened the existing edge shall be thoroughly cleaned, all grass and top soil bladed off and removed.

- B. Pavement Repair - Repair of potholes and edges when required shall include complete removal of all loose material and water, cutting back edges of pavement to sound asphalt, tacking the area to be repaired, filling the hole or replacing the pavement edges to original width with hot plant mix asphalt, and compacting the asphalt material. The top plane of the repair shall conform to the existing asphalt surface.

If a leveling course or intermediate base course is required, hot mix asphalt shall be applied at those locations designated by the Engineer. The area to be leveled shall be tacked before spreading Hot Mix. The Hot Mix may be spread and leveled with a motor grader or asphalt spreader and compacted with a rubber tired roller.

Turnout aprons when required shall be constructed at locations shown on the plans or designated by the Engineer. The area to be paved shall be graded to remove excess, loose or unsuitable material and to shape the area to match the existing pavement configuration.

### 3.03 STRIPING AND SYMBOLS

All surfaces to receive stripes or symbols shall be thoroughly cleaned immediately prior application of markings. The stripes shall be of uniform density and shall have true sharp edges and ends. The width of the line shall conform to the specified width within a tolerance of one eighth (1/8) inch. The tolerance on alignment shall be one (1) inch in fifty (50) feet.

The rate of application and all other technical specifications shall be performed in compliance with said MDOT Standard Specifications for painted stripe.

### 3.04 TESTING

At least 15 days prior to placement of Hot Mix Asphalt, the Contractors shall furnish for the Engineer's approval single job mix formula for each mixture of asphalt to be used on the project. Such job mix formula is provided at the Contractor's expense. Plant monitoring and density tests must be conducted and reported by State Aid Standards and by a State Aid Certified laboratory. All testing is the responsibility and at the expense of the Contractor. The Contractor shall daily furnish copies of "Asphalt Inspector's Daily Report" or similar report which the Asphalt Plant Laboratory maintains for quality control. The Contractor shall pay for all asphalt testing.

## PART 4 – MEASUREMENT AND PAYMENT

### 4.01 OPEN CUT ASPHALT DRIVEWAY REPAIR

Open cut asphalt driveway repair shall be measured on a “per linear foot” basis. The length of the patch shall be measured along the centerline of the waterline trench from edge to edge of the driveway, and shall include but not be limited to scoring asphalt at the removal limits, removing the asphalt, disposing of removed asphalt, furnishing granular base, compacting granular base to restore usage of the pavement, maintaining the granular base patch, saw cutting asphalt immediately prior to repair, removing granular base as required for asphalt placement and construction of a hot mix bituminous patch.

Prior to asphalt pavement Contractor shall maintain the temporary patch to provide a smooth rideable surface. If the Contractor fails to maintain temporary patches to the extent that there is a noticeable depression or bump, then the Owner's Representative shall make a verbal request for maintenance. If maintenance is not performed to bring the patch to a smooth, even grade then the Owner shall have the option to perform the maintenance and deduct the cost from the Contractor's pay request.

END OF SECTION

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SECTION 02600  
WATER MAINS

PART 1 GENERAL

1.01 DESCRIPTION

This work shall consist of all labor, materials, equipment, tools and services required to furnish and install water mains, fittings, joint restraint and related appurtenances at sites and locations as designated in these specifications and in reasonably close conformity with the lines and grades specified in the Drawings.

1.02 SPECIFIED ELSEWHERE

Section 02020	Clearing and Grubbing
Section 02610	Earthwork for Utilities
Section 02620	Directional Drilling of Water Mains
Section 02640	Water Services
Section 02650	Tapped Connections to Water Mains
Section 02660	Gate Valve Assemblies
Section 02670	Fire Hydrant Assemblies
Section 02680	Testing for Pressure Piping
Section 02820	Master Meters

PART 2 MATERIALS

2.01 SELECT MATERIAL

Select material for pipe embedment and haunching shall be clean, granular material with no more than 10% by weight passing the No. 200 sieve. Select material shall be free of roots, debris, vegetative matter and other extraneous material.

2.02 PIPE TYPE

Water pipe shall be one of the following as designated on the drawings. If pipe type is not designated then the Contractor shall have the option of choosing one of the following.

2.03 PVC PIPE AND FITTINGS (4" TO 12" DIAMETER)

2.03.1 Pipe

Polyvinyl Chloride (PVC) pipe 12" in diameter and smaller shall conform to AWWA C-900, Class 150, SDR-18. Pipe shall be made to cast iron O.D.'s. Each length of pipe shall be stamped with approval of National Sanitation Foundation and Underwriters Laboratories, Inc. for transporting potable water. Pipe couplings or joints shall be an integral part of the pipe barrel, consisting of an expanded bell with a groove to retain a rubber sealing ring conforming to the requirements of AWWA C-111. Gaskets shall be factory bonded into the groove. At least 85 percent of pipe shall be in standard 20 foot lengths. Remaining random lengths shall not be less than 10 feet long.

### 2.03.2 Fittings

Fittings for buried PVC pipe shall be mechanical joint cast iron or ductile iron fittings. Cast iron fittings shall conform to ANSI A-21.10 (AWWA C-110), 250 p.s.i rated with cement lining. Ductile iron fittings shall conform to ANSI A-21.10 (AWWA C-110), 350 p.s.i. Rated with cement lining.

### 2.03.3 Joint Restraint

Joint restraint shall be required at all bends, tees, inserta-valves, dead end caps and fire hydrants. Joint restraint shall be concrete thrust blocks and/or retainer glands as designated on the drawings. If no designation is made on the drawings then the contractor shall have the option of selecting the type of joint restraint provided.

## 2.04 DUCTILE IRON PIPE AND FITTINGS

### 2.04.1 Pipe

Ductile Iron Pipe shall conform to ANSI A-21.51 (AWWA C-151) Grade 60-42-10 Ductile Iron, thickness Class 52. Pipe interior shall be cement mortar lined per ANSI A-21.4 (AWWA C-104).

### 2.04.2 Fittings

Fittings for buried ductile iron pipe shall be mechanical joint cast iron or ductile iron fittings. Cast iron fittings shall conform to ANSI A-21.10 (AWWA C-110), 250 p.s.i rated with cement lining. Ductile iron fittings shall conform to ANSI A-21.10 (AWWA C-110), 350 p.s.i. rated with cement lining. Rubber gaskets for mechanical joints shall comply with ANSI A-21.11 (AWWA C-111).

### 2.04.3 Joint Restraint

Joint restraint shall be required at all bends, tees, inserta-valves, dead end caps and fire hydrants. Joint restraint shall be concrete thrust blocks and/or retainer glands as designated on the drawings. If no designation is made on the drawings then the contractor shall have the option of selecting the type of joint restraint provided.

### 2.04.4 Restrained Couplings

Restrained couplings shall be used when plain end pipe joints must be connected within 20 feet of a fitting or other appurtenance such as a fire hydrant that requires joint restraint. Restrained couplings shall be used to connect pipes of similar diameter that are different materials. Restrained couplings shall also be used to connect same diameter pipes of the same material if two plain end pieces must be connected. Unrestrained couplings may be used to connect plain end pipes of similar diameter where joint restraint is not required.

## 2.05 HDPE PIPE AND FITTINGS

HDPE pipe for water mains shall be as specified in Section 02715, Directional Drilling.

## 2.06 MARKER TAPE

Detectable underground utility marker tape for burial with PVC pipe shall be a minimum of 5 mils thick and 3 inches in width. Minimum tensile strength shall be 35 pounds and tape shall elongate not less than 80 percent before breaking. Tape shall be permanently imprinted with an appropriate legend to identify the contents of the pipe.

## 2.07 BALL MARKERS

When specifically indicated on the plans electronic ball markers shall be provided in a standard frequency and color coded (blue) to APWA standards for water systems. The markers shall be readable with proper instrumentation to a bury depth of five (5) feet. The markers shall be a four (4) inch diameter sphere, weigh 0.77 lb., have a high-density, watertight polyethylene shell.

## 2.08 TRACER WIRE

Underground tracer wire shall be composed of UNS C10200 grade annealed copper conductor wire not less than 14 American Wire Gage(AWG) covered with not less than 15 mil PVC insulation. Tracer wire shall meet or exceed UL Standard 83, UL Standard 1063 (MTW) and National Electrical Code (NFPA70). Tracer wire shall be THHN Tracer Wire or equal.

## 2.09 CONCRETE

Concrete shall conform to requirements for Class B concrete, MDOT Standard Specifications.

## 2.10 REINFORCEMENT

Reinforcement shall be grade 40 or grade 60 billet steel conforming to ASTM A-615.

## PART 3 - EXECUTION

### 3.01 LAYOUT

The Contractor shall contact "One Call" prior to water line construction. After existing utilities have been marked the Contractor shall indicate the proposed location of water lines using white pin flags and white marking paint. After marking has been completed the Contractor shall request that the Engineer review the proposed location. After observing the proposed location the Engineer shall issue written direction to proceed or adjust the proposed route. The Contractor shall not proceed with water main construction without written authorization from the Engineer.

### 3.02 TRENCHING

Trenching shall comply with this section and Section 02700 Earthwork for Utilities.

### 3.03 PIPE LAYING

Pipe laying shall comply with Section 02700 Earthwork for Utilities and with the additional requirements specifically for water lines that are contained in this section.

If dirt enters a water main, the dirt shall be removed and the interior pipe surface swabbed with a 1 percent hypochlorite disinfecting solution.

If pipe and fittings are not kept dry during installation, Contractor shall ensure that any water entering the pipe contains an available-chlorine concentration of approximately 25 mg/l by adding calcium hypochlorite granules or tablets to each length of pipe.

### 3.04 BEDDING AND BACKFILL

Bedding and backfill shall comply with this section and Section 02700 Earthwork for Utilities.

### 3.05 JOINT RESTRAINT

All connections between unrestrained pipe and fittings shall be made with an approved restrained joint system. In addition, all pipe joints within a distance of 19 feet of a fitting must also employ an approved restrained joint system. The assembly and installation of each restrained joint system shall be in strict accordance with the manufacturer's printed instructions and in the presence of a representative of the Engineer.

### 3.06 PIPING ADJACENT TO RESTRAINED FITTINGS

If available length is the sufficient, the Contractor shall install only full lengths of pipe adjacent to fittings unless an exception is authorized by the Engineer.

### 3.07 THRUST BLOCKS

Concrete thrust blocks shall be installed as indicated on the plans.

### 3.08 PROTECTION FROM CONTAMINATION

Pipe delivered for construction shall be stored so as to minimize the entrance of foreign materials. The Contractor must use care to prevent the entry of ground water or other contaminants into the water pipe, fittings, valves and appurtenances, either before, during, or after construction. If pipe laying is to be suspended for 2 hours or more the end of the pipe shall be capped with a watertight plug. All openings in the pipeline shall be closed with watertight plugs when pipe laying is stopped at the end of a day's work.

### 3.09 CONTINUITY OF WATER SERVICE

Connections to existing distribution system shall be made as indicated on the plans with no interruption of service or reduction of pressure.

### 3.10 ASBESTOS CEMENT PIPE

Where the project requires connection, removal, or any type of contact with existing asbestos cement pipe, Contractor shall comply with all local, state and federal requirements for cutting, handling and disposal of asbestos cement pipe.

### 3.11 WATER USAGE FOR CONSTRUCTION

The Contractor shall coordinate the use of domestic water with the Owner. The Owner will provide a metering device for the Contractor to utilize while withdrawing water from the distribution system for the filling of the new water mains and for flushing. The contractor shall pay for all water usage at the Owner's current billing rates.

### 3.12 PROTECTION OF ACTIVE FACILITIES

The new water mains shall be kept isolated from the active distribution system by physical separation until satisfactory bacteriological testing has been completed and the disinfected water flushed out. Water required to fill the new water mains for hydrostatic pressure testing, disinfection and flushing shall be supplied through a temporary connection between the distribution system and the water main and shall include an appropriate cross-connection control device.

### 3.13 FLUSHING

Water mains and any service lines shall be thoroughly flushed upon placing the associated water main into service. The Contractor shall be responsible for the proper handling and disposal of water discharged during flushing. The discharge of flushing



water shall be managed in a manner that will not adversely impact private property, other construction, traffic or the general public. No water shall be discharged to the sanitary sewer collection system. The Contractor shall advise and coordinate flushing of water mains with the utility system owner so that no pressure problem will be created. In case of fire or emergency, the Contractor shall temporarily cease flushing operations.

### 3.14 DEPTH

Water lines shall be constructed with a minimum of 36 inches of cover over the top of the pipe. Deeper laying depth will be needed for crossings and at special appurtenances such as air release valves, if installed.

### 3.15 WATER - SEWER CLEARANCE

***Water mains shall be installed at least 10 feet horizontally and at least 18 inches vertically (the bottom of the water line must be 18 inches above the top of the sewer line) from existing or proposed sanitary sewers, storm sewers and sewer manholes. The distance shall be measured edge to edge. Where water lines cross over sewer lines (minimum 18" vertical separation) water line joints should be located at the maximum distance possible from sewer line joints.***

### 3.16 WATERLINE REMOVAL

Water lines with a diameter of 8 inches or smaller shall be either removed or cut and plugged. The method of demolition shall be the option of the Contractor with the exception of locations where removal is necessary to construct new facilities. If utility lines are left in place then every cut or break shall be sealed with a cap or with concrete, grout or other similar product.

### 3.17 TESTING

Water mains and services shall undergo a pressure test and a leakage test according to Section 02666, Testing for Pressure Piping.

### 3.18 DISINFECTION

#### 3.18.1 Procedure

After completion of the construction and disinfection of water distribution lines, the contractor shall arrange for at least one microbiological water sample to be collected by a representative of the Mississippi State Department of Health, the Licensed Professional Engineer in charge of the project, or the Certified Operator for the system from every dead-end line and every major looped line. Water being collected for testing shall not have a chlorine residual higher than is normally maintained in other parts of the distribution system. No chlorine shall be present which is a result of line disinfection. A sample showing "No Coliform Present" shall constitute a satisfactory sample when analyzed by the Mississippi State Department of Health environmental laboratory or a laboratory certified by the MSDH.

#### 3.18.2 Sampling

***Bacteriological sampling must be done by a technician from an independent testing laboratory preapproved by the engineer. Bacteriological sampling cannot be taken by the contractor.*** After final flushing and before the new water mains are connected to the distribution system, the Contractor shall arrange for water samples to be collected and tested for bacteriological quality by a laboratory certified by the Mississippi State

Department of Health. At least one set of samples shall be collected from every 1200 feet of looped lines and from every dead-end line. No hose or fire hydrant shall be used in the collection of samples. The costs for all bacteriological sampling and testing shall be the responsibility of the Contractor.

### 3.18.3 Chlorine Residual

Water being collected for testing shall not have a chlorine residual higher than is normally maintained in other parts of the distribution system. No chlorine shall be present which is a result of line disinfection. A sample showing "No Coliform Present" shall constitute a satisfactory sample when analyzed by Mississippi Department of Health Laboratory or a laboratory certified by the Mississippi State Department of Health. This disinfection and sampling procedure shall be repeated until two consecutive acceptable samples (taken at least 24 hours apart) are obtained from each sample point.

### 3.18.4 Additional Testing

If trench water has entered the new mains during construction or, if in the opinion of the Engineer, excessive quantities of dirt or debris have entered the new mains, bacteriological samples shall be taken at intervals of approximately 200 feet. Samples shall be taken of water that has stood in the new mains for at least 16 hours after final flushing has been completed.

### 3.18.5 Remedial Testing

If the initial disinfection fails to produce satisfactory bacteriological results, the new mains shall be reflushed and resampled. If check samples also fail to produce acceptable results, the mains shall be rechlorinated by the continuous-feed or slug method of chlorination as described in the latest revision of AWWA C651 until satisfactory results are obtained.

### 3.18.6 Coordination

The testing and disinfection operations shall be coordinated with local water utility.

### 3.18.7 Discharge of Water

The Contractor shall be responsible for the proper handling and disposal of water discharged during flushing and chlorination operations. All water discharged from flushing, testing and disinfection shall be disposed of in a manner that will impact adjacent property, other construction, traffic or the general public. No water shall be discharged to the sanitary sewer collection system.

## 3.19 LOCATING EXISTING WATER MAINS

The Contractor is advised that existing water mains do not have locating wire and may require significant effort to locate.

## PART 4 - MEASUREMENT AND PAYMENT

### 4.01 WATER MAINS

Water Mains shall be measured on a "per linear foot" basis horizontally over the top of the installed water main.

This pay item shall include all labor, materials, adapters and other equipment necessary for a complete and fully functional final product. Elbows, bends, reducers, adapters and all other fittings shall not be measured separately unless specifically included as a pay

item on the Bid Schedule. All fittings not included in the bid schedule shall be included in the water main footage and paid for at the “per linear foot” bid price for water main. Payment shall include erosion control, traffic control if necessary, and securing any open excavation areas that are left unattended.

Removal of unsuitable material and backfilling with offsite select material shall be a separate pay item and shall not be included in the payment for water mains.

#### 4.02 LOCATE AND TIE TO EXISTING WATER MAIN

This pay item shall be measured on a “per each” basis and shall include all labor, materials, adapters, fittings and other equipment necessary for a complete and fully functional tie in. Payment shall include locating and verifying the size and pipe type when connecting to existing piping. Payment shall also include erosion control, traffic control if necessary, and securing any open excavation areas that are left unattended. Additionally, payment shall include thrust restraint and backfilling with compacted onsite material.

#### 4.03 LOCATE CUT AND CAP EXISTING WATER MAINS

Cut and Cap Existing Water Mains shall be measured on a “per each” basis where shown on the drawings and shall include all labor, materials, adapters and other equipment necessary for a securely capped water line. Payment shall include locating and verifying the size and pipe type for capping. Payment shall also include erosion control, traffic control if necessary, and securing any open excavation areas that are left unattended. Additionally, payment shall include thrust blocking and backfilling with compacted onsite material.

Lines that are not shown on the drawings as cut and capped but are cut and temporarily capped for the convenience of the Contractor or to restore water service shall not be measured for payment.

#### 4.04 BLOW OFF VALVE ASSEMBLIES

Blow off valve assemblies shall be measured on a “per each” basis and shall include brass nipples, brass elbow, brass curb stop, galvanized riser pipe, cap for riser pipe, cast iron valve box for curb stop, meter box, concrete valve box marker and blue PVC marker and all labor, equipment and materials required for a complete and fully functional final product.

#### 4.05 OFFSITE SELECT MATERIAL FOR PIPE EMBEDMENT AND HAUNCHING

When existing material is judged to be unsuitable by the Engineer select material for pipe embedment and haunching shall be obtained from outside the project site. Offsite select material shall be field measured on a “cubic yard” basis. Only material imported into the project area shall be measured for payment.

#### 4.06 TRACER WIRE AND MARKING TAPE

Tracer wire and utility marking tape shall not be measured for separate payment but shall be included with the cost of the construction of water mains. Tracer wire shall include the extra wire required for turn-up connections at valve boxes.

Abandoned Water Mains shall not be measured for payment and shall not require any work except the work that is paid for according to the cut and cap pay item.

4.07 DEMOLITION OF WATER LINES

Demolition of water lines shall not be measured for separate payment but shall be subsidiary to water line construction.

END OF SECTION

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SECTION 02610  
EARTHWORK FOR UTILITIES

PART 1 – GENERAL

1.01 DESCRIPTION

This work shall consist of trenching and backfilling as required for the construction of water mains and associated work.

PART 2 – PRODUCTS

2.01 SELECT MATERIAL

Select material shall be clean, granular material with no more than 10% passing the No. 200 sieve. Select material shall be suitable for compaction to a stable final product provided that its moisture content is adjusted as required. If weather conditions and/or moisture retention characteristics of an otherwise acceptable material substantially hinder moisture control efforts, then the material shall be considered unsuitable.

2.02 PIPE FOUNDATION MATERIAL

Foundation material shall be clean, uniformly graded coarse sand.

2.03 SAND EMBEDMENT AND BACKFILL

Sand for embedment and backfill shall be clean, well graded material that is readily compacted and shall be equivalent to the local characteristics of concrete sand that is used in ready mixed concrete.

PART 3 – EXECUTION

3.01 SCOPE

Excavation shall include the loosening, loading, removing, transporting and stockpiling and disposing of all materials, wet or dry, above or below ground necessary to be removed to construct all pipes included in this contract to the lines, grades and locations shown on the Drawings. No burying or burning of trees, stumps, roots, or other debris will be allowed.

Where required, the Contractor shall remove with care all shrubbery, plants, flower planters, flower bed borders, relocated, watered, and kept alive and replanted as before construction work. The Contractor shall furnish and install replacement plants which die as a result of construction operations.

3.02 TREE PROTECTION

In areas where pipe will be installed in close proximity to trees, the major root systems of the trees shall be protected from damage. Where indicated on the Drawings, the Contractor shall install piping by boring underneath the tree roots.

3.03 SHEETING AND SHORING

The Contractor shall, at his own expense, furnish and install all temporary sheeting, timbering and bracing required to maintain the excavation in a condition to furnish safe working conditions and to permit the safe and efficient installation of all items of contract work. The Contractor shall further, at his own expense, shore up or otherwise protect all fences, buildings, walls, walks, curbs, or other property adjacent to any excavation which might be disturbed during the progress of the work, except for such facilities which are

within the allowable trench limits and are designated for removal and restoration.

#### 3.04 TEMPORARY SUPPORTS

Temporary supports shall be installed as required to protect existing light poles or other facilities. Temporary supports must be installed and removed by the Contractor at his own expense after or concurrently with the completion of the permanent facility.

#### 3.05 POWER POLE SUPPORT

The Contractor shall contact the owner of any utility poles that are in the vicinity of excavation. The Contractor shall arrange his construction schedule to accommodate the utility owner's methods to provide temporary support. The Contractor shall also pay all cost associated with the support of facilities by others.

#### 3.06 STABILITY AND MOISTURE CONTROL

The Contractor shall do all ditching, pumping, well pointing and bailing, build all drains, and do all other work necessary to keep the excavation clear of ground water, sewage or storm water during the progress of the work and until backfilling. Where the excavation is in wet sand, and suitable construction conditions cannot be obtained by other methods, the Contractor shall install and operate, at his own expense, a pumping system connected with well points as required for safety and stability. All well point holes shall be backfilled with sand after removal.

No pipe shall be laid in water. All water pumped or drained from the work shall be disposed of in a manner that will not damage adjacent property or other work under construction. Necessary precautions shall be taken to protect all construction against flooding.

#### 3.07 UTILITY CONFLICTS

In the event that any existing gas pipe, water pipes, conduits, sewers, tile drains or poles are blocked or interfered with by the excavation required on this project, the Contractor shall maintain them in continuous operation, and restore them to the same condition as they were prior to the start of construction of this project. Gas pipes or electrical power distribution facilities which are disturbed in any way shall be inspected and repaired (if necessary) by the utility owner. All at no additional compensation.

Any drainage pipe joint exposed by excavation shall be wrapped with an approved geotextile filter fabric, three feet in width, before backfilling, at no additional compensation.

#### 3.08 SURPLUS MATERIAL

Unsuitable and surplus excavated material not incorporated in the work shall be the property of the Contractor and shall be disposed of properly at the Contractor's expense.

#### 3.09 EXCAVATION OUTSIDE DESIGNATED LIMITS

The Contractor shall not excavate outside the easement, right of way or property limits. Whenever the excavation is carried beyond a designated limit of construction, the Contractor shall, at this own expense, repair and replace all damaged items outside the construction limit. The Contractor shall also restore the excavated area to original condition using sod, seeding and/or imported fill as needed.

#### 3.10 DEPTH

Unless otherwise indicated on the Drawings utility mains shall be constructed with a minimum of 36 inches of cover over the top of the pipe. Deeper laying depth will be needed for crossings and at special appurtenances such as air release valves, if

installed.

### 3.11 TRENCHING

- 3.11.1 The ground shall be excavated in open trenches, of sufficient width and depth to provide ample room within the limits of the excavation, or lines of sheeting and bracing, for the proper construction of the water main.
- 3.11.2 Mechanical excavation of trenches shall be stopped above the final invert grade elevation so that the pipe may be laid on a firm, undisturbed native earth bed.
- 3.11.3 When the native bedding material encountered in the trench bottom appears to be of lesser quality than select bedding, consists of a material deemed by the Engineer to be unsuitable for pipe bedding, the Contractor shall overdig to a depth as specified in the Drawings and replace with bedding material. Should overdigging occur where a suitable native soil exists for bedding purposes, the Contractor shall fill the area of over-excavation with compacted select backfill.
- 3.11.4 The minimum depth of excavation shall be as required for a cover over the completed water main of not less than 36 inches. Where water pipes cross under existing drainage facilities, the contractor shall provide not less than 30 inches cover under ditches or 12 inches clearance under storm drain pipes.

### 3.12 PIPE LAYING

- 3.12.1 Pipe shall be protected during handling against impact shocks and free fall. Pipe shall be clean at all times, and no pipe shall be used in the work that does not conform to the appropriate specifications.
- 3.12.2 Pipe, fittings and other accessories shall be handled with care to minimize damage to any protective coatings. The interior of all pipe, fittings, and other accessories shall be kept free from dirt and foreign matter at all times.
- 3.12.3 Pipe shall be laid accurately, to the line and grades with fittings and valves at the required locations as designated in the Drawings. Preparatory to making pipe joints all surfaces of the portions of the pipe to be jointed or of the factory-made jointing material shall be clean and dry. Lubricants, primers, adhesives, etc., shall be used as recommended by the pipe or joint manufacturer's specifications. The jointing materials or factory fabricated joints shall then be placed, fitted, joined, and adjusted in such a workmanlike manner as to obtain the degree of water-tightness required.
- 3.12.4 All joints shall be properly made with suitable penetration of plain pipe end into the receiving portion of the fitting in accordance with manufacturer's recommended jointing procedure.
- 3.12.5 The trench shall be dug to the alignment and depth indicated in the plans. The pipe shall be laid upon sound soil, cut true and even so that the barrel of the pipe will have a bearing for its full length.
- 3.12.6 Pipe shall be laid with bell ends facing in the direction of laying. No pipe shall be laid in standing water. Contractor shall be responsible for providing pumps and/or a well point system, at his own cost, if necessary to maintain a water-free trench.
- 3.12.7 After placing a length of pipe in the trench, the joint shall be held around the bottom of the spigot so that it will enter the bell as the pipe is shoved into position. The spigot shall be centered in the bell, the pipe shoved into position, and brought into true alignment. Care shall be taken to prevent dirt from entering the joint space.
- 3.12.8 As soon as possible after the joint is made, sufficient backfill material shall be placed along each side of the pipe to offset conditions that might tend to move the pipe off line

and grade.

- 3.12.9 Wherever necessary to deflect pipe from a straight line, either in the vertical or horizontal plane, to avoid obstructions, to plumb stems, or where long radius curves are permitted, the degree of deflection shall be in accordance with the pipe manufacturer's recommendations.

### 3.13 BEDDING AND BACKFILL

- 3.13.1 All trenches and other excavation shall be bedded and backfilled as soon as the piping and any other facilities have been constructed. Backfilling may be delayed in the vicinity of an item such as concrete thrust blocks when time is required to attain suitable strength to resist the weight of the backfill.
- 3.13.2 Trenches shall be dry when the trench bottom is prepared. A continuous trough shall be pared or excavated to receive the bottom of the pipe barrel. In addition, bell holes shall be excavated so that after placement, only the barrel of the pipe shall receive bearing pressure from the trench bottom.
- 3.13.3 Preparation of the trench bottom and placement of the pipe shall be carefully made so that when in final position, the pipe is true to line and grade.
- 3.13.4 Pipes shall be embedded immediately after placement. Natural select material shall be carefully placed to fill all voids. The material shall then be placed to the spring line of the pipe and compacted as required to achieve the designated density.
- 3.13.5 After embedment pipes and other facilities shall then be backfilled with select material to form lifts having an uncompacted thickness of up to 12 inches.
- 3.13.6 If not designated on the Drawings, embedment and backfill in unpaved areas shall meet or exceed 85 percent Standard Proctor Density.
- 3.13.7 If not designated on the Drawings, embedment and backfill in paved areas or areas within 5 feet of pavement and structures shall be compacted to 95% Standard Proctor Density.
- 3.13.8 **OFFSITE SELECT MATERIAL:** Where the excavated soil does not meet the requirement for select material and there is no select material available from other construction activities, the Engineer may authorize the replacement of such unsuitable material with offsite select material that is obtained and hauled from offsite sources.

### 3.14 MINIMUM COVER

All water mains and force mains shall be constructed so that there is at least 36 inches of cover. Pipe cover shall be defined as the vertical measurement from the highest point on the outer diameter of the pipe to the final grade above the pipe. Mounding backfill over the pipe is required but not counted for minimum cover.

### 3.15 WATER/SEWER SEPARATION

#### 3.15.1 Water Main Location

***Water mains shall be installed at least 10 feet horizontally and at least 18 inches vertically (the bottom of the water line must be 18 inches above the top of the sewer line) from existing or proposed sanitary sewers, storm sewers and sewer manholes. The distance shall be measured edge to edge. Where water lines cross over sewer lines (minimum 18" vertical separation) water line joints should be located at the maximum distance possible from sewer line joints.***



### 3.15.2 Horizontal Separation

The Contractor shall adjust only those lines which interfere with the accomplishment of the work, or as directed by the engineer. Water mains shall be adjusted to be at least 10 feet horizontally from any sewer main or manhole. Likewise, gravity sewer mains and force mains shall be adjusted to be at least 10 feet from water lines.

### 3.15.3 Vertical Separation

Where water lines cross over sewer lines or where sewer lines cross under water lines, the pipe segments shall be centered to provide maximum spacing of joints away from the crossing. Where there is not sufficient room to provide 10 feet of horizontal separation, the water line must be installed a minimum of 18 inches clear distance above the sewer line or the sewer line must be installed a minimum of 18" clear distance lower than the water line.

Where a sewer main crosses under a water main, adequate structural support shall be provided for the sewer to prevent the sewer from settling. Where there is less than 18" vertical separation, either the water main or the sewer shall be ductile iron or shall be encased in ductile iron or steel with a full joint of casing centered on the crossing.

### 3.15.4 Special Exceptions

Where unforeseen conditions prevent adequate horizontal and vertical separation, the Engineer may request appropriate reviewing agency authorization to allow less water/sewer separation. The Contractor is advised that the review of special exceptions may be time consuming and that the timeliness of such review is beyond the control of the Owner and Engineer. The Contractor is also advised that the following construction may be used with regulatory permission when the water/sewer separation is inadequate.

### 3.15.5 Inadequate Horizontal Separation

If the 10 foot horizontal separation between water and sewer lines cannot be maintained then a ductile iron water line shall be constructed so that joints are located at the maximum distance possible from sewer line joints. PVC pipe water pipe may be used if it is protected by a steel casing. Also, the water and sewer lines must be in separate trenches with adequate space for maintenance.

### 3.15.6 Inadequate Horizontal and Vertical Separation

Where both 10 foot horizontal and 18 inch clear distance vertical separation cannot be maintained, both the water line and the sewer line shall be constructed using ductile iron pipe or a steel casing as previously described.

### 3.15.7 Inadequate Vertical Separation

Where water lines cross over sewer lines, a full joint of water pipe shall be centered over the sewer pipe to maximize the distance from sewer pipe bell to water pipe bell.

## 3.16 TRACER WIRE

All nonmetal pressure pipe installations shall have a tracer wire be buried in the backfill approximately 12 inches above the pipe. The detectible tracer wire shall be attached to fittings, valves, hydrants, etc. to provide a location above ground to transmit the signal to the wire without having to dig down to the pipe.

## 3.17 PROTECTION FROM CONTAMINATION

Care shall be exercised to prevent soil and other debris from entering the pipe during construction.

### 3.18 OPEN EXCAVATION AREAS

No excavated area that could be a safety hazard shall be left open overnight. All open excavations that are left open overnight shall be secured with temporary fencing. Excavations in roadway right of way or near private drives or parking areas shall also be secured with flashing warning lights if open during the dusk or dark portion of the day.

## PART 4 - MEASUREMENT AND PAYMENT

### 4.01 OFFSITE SELECT MATERIAL FOR PIPE EMBEDMENT AND HAUNCHING

When existing material is judged to be unsuitable by the Engineer select material for pipe embedment and haunching shall be obtained from outside the project site. Offsite select material shall be field measured on a "cubic yard" basis. Only material imported into the project area shall be measured for payment.

END OF SECTION

FOR VIEWING ONLY  
NOT FOR BIDDING PURPOSES

SECTION 02620  
DIRECTIONAL DRILLING OF WATER MAINS

PART 1 GENERAL

1.01 SCOPE

The work shall consist of furnishing and installing HDPE pressure pipe for the construction of directionally drilled utility crossings of roadways, ditches, creeks and other physical features that prevent open cut construction

1.02 QUALIFICATIONS

HDPE pipe fusion shall be performed by a pipe layer that has received manufacturer's training and certification for operation of a fusion machine. Certified pipe layers shall have a minimum of two years experience in butt fusion of HDPE pipe and directional drilling in general.

1.03 SUBMITTALS

The following items shall be submitted for review and approval by the Engineer prior to mobilizing for any directional drilling operations.

1. Qualification statement for the fusion machine operator
2. Description of the boring equipment and cutting head being used
3. Method of monitoring and controlling line and grade
4. Drilling mud composition

PART 2 PRODUCTS

2.01 HDPE PRESSURE PIPE AND FITTINGS

A. Pipe Material

Pipe for directional drilling shall be manufactured from HDPE resin meeting the requirements of ASTM D3350 with cell classification conforming to PE345434C. Minimum thermal stability shall meet or exceed ASTM D3350.

B. Pipe Class and Dimensions

DR 11 HDPE pipe rated at 160 psi or greater is required. Dimensional size shall be based on IPS (iron pipe size).

C. Pipe Markings

The pipe shall be clearly marked with a blue stripe for potable water mains, manufacturer's name, nominal pipe size, dimensional size class (IPS), material class (PE 3408), dimension ratio (DR 11), ASTM D3035 or ASTM F714, date of manufacture and point of origin.

D. Fittings

ASTM D3261 injection molded fittings with fitting ends suitable for butt fusion joints are required. Pressure rating of fittings shall be the same as the pressure rating of the pipe to which they are fused.

#### E. Flange Adapters

Flanged joints shall comply with ANSI B/16.1, Class 125 flat face with pressure rating same as adjacent pipe. Flange adapters shall be manufactured by the pipe manufacturer. Flanged joints shall have backup rings, bolts, nuts and washers manufactured of ductile iron.

#### F. Flange End Fitting

HDPE plain end by flange end fitting shall be a one piece assembly with one end of HDPE pipe with butt fusion jointing technique and other end being steel or brass flange. Steel flanges shall be coated with fusion bonded epoxy.

#### G. Jointing

All joints shall be butt fusion type. Socket fusion, saddle/sidewall fusion and electrofusion jointing technique fittings may be allowed only in special cases if there is a specific reason why butt fusion can not be used. Use of any type of joint other than butt fusion shall require written permission from the Engineer for each location where butt fusion is not used.

#### H. Transition Fittings

Transition from HDPE to PVC shall be accomplished using a stiffener, mechanical joint sleeve, transition gasket and restrained joint fittings on both HDPE and PVC.

### PART 3 EXECUTION

#### 3.01 TRAFFIC CONTROL AND SAFETY

The Contractor shall furnish and install all required barricades, flagging and traffic control devices as required to protect workers and the public. All traffic control devices shall comply with the MUTCD, latest edition. Roadway detours, if required, shall comply with MDOT traffic control requirements.

#### 3.02 PILOT HOLE

A pilot hole shall be bored to establish the line and grade of the main bore. If an obstruction is encountered that blocks the drilling operation, the Contractor shall notify the Engineer and propose another boring location that is near the original location. If the proposed location is acceptable to the Engineer, then boring shall proceed at the alternate location.

#### 3.03 DRILLING FLUID CONTROL

The Contractor shall maintain adequate drilling fluid in the bore hole to increase stability of the surrounding soil and reduce drag on pulled pipe. The Contractor shall dispose of drilling fluid and other spoils in accordance with laws, ordinances, rules, and regulations of local jurisdiction. Excess fluids and other spoils shall be transported to a suitable disposal location. The Contractor shall immediately clean up any drilling fluids that inadvertently surface.

### 3.04 PIPE INSTALLATION

The Contractor shall provide a swivel to reaming assembly and pull section of pipe to minimize torsional stress on pull section after drilling the pilot hole. The reaming diameter shall be limited to 1.5 times the outside diameter of HDPE pipe being installed. The pull section shall be protected as it proceeds during pull back so that it moves freely and is not damaged.

Detection wire shall be pulled along with HDPE pipe. Extend wire into locator station at each end of HDPE pipe.

When connecting to adjacent pulled or non-pulled section of HDPE pipe, allow pull section of pipe to extend past termination point. Make tie-ins the next day after pullback of HDPE pipe.

### 3.05 TESTING

HDPE pipe shall be pressure tested using the same procedure as the piping to which it is connected. Test pressure shall be based on the pressure of the main line to which the directionally drilled pipe is connected. Test pressure shall be based on the directionally drilled pipe in the case of a phased project that will not be connected to a main until the future.

## PART 4 PAYMENT METHOD

### 4.01 DIRECTIONAL DRILL WATER MAIN

Directional Drill for water mains where indicated on the plans shall be measured for payment horizontally from each of the ends of the transition fittings that connect to PVC water main. If measurement is made prior to the installation of transition fittings then a horizontal measurement shall be made from the points on each end of the crossing where the top of the directionally drilled pipe has a depth of three feet. The length of pipe from the three foot depth to ground level and above shall not be measured for payment. See directional drill detail on the plans for clarification.

Payment for directional drilling water mains shall be made on a "per linear foot" basis at the pipe diameter indicated on the bid form and shall include HDPE pipe, transition fittings, tracer wire, flushing, pressure testing, disinfection, bacteriological testing and all labor, equipment and materials to provide a complete and fully functional final product.

### 4.02 DIRECTIONAL DRILL CASING WITH WATER MAIN CARRIER PIPE

Directional drill for casings shall be measured for payment the same as for directional drilled water mains. Payment shall include the casing and all the items previously stated, the water main inside the casing, casing spacers and sealing the casing ends.

END OF SECTION

SECTION 02630  
CASED CROSSINGS

PART 1 GENERAL

1.01 DESCRIPTION

These Specifications shall govern the furnishing and installing of cased crossings using steel pipe and High Density Polyethylene (HDPE). The casing pipe and accessories shall be installed in accordance with the requirements of these specifications. The casing shall be of the class, size and dimensions shown thereon.

1.02 SPECIFIED ELSEWHERE

Section 02600	Water Mains
Section 02610	Earthwork for Utilities
Section 02620	Directional Drilling for Water Mains

1.03 QUALIFICATIONS

- A. Cased crossings shall be performed by Contractors who are familiar with and experienced in such work with a minimum of two years of experience.
- B. The Contractor shall provide and maintain the principal equipment necessary to perform all of the work herein specified in an orderly manner. The equipment shall consist of approved units designed or selected to perform and expedite all of the work and incidental items of construction.
- C. Reference Standards: Comply with the applicable provisions of ASTM A 139, Specification for Electric fusion (Arc) — Welded Steel Pipe

1.04 SUBMITTALS

- A. Qualification statement for the operator.
- B. Description of the equipment being used.
- C. Methods of construction

1.05 JOB CONDITIONS

Scheduling: The Contractor shall notify the Engineer not less than three (3) business days in advance of commencing work. Contractor shall obtain all necessary permits and submit them to the Engineer prior to commencing work. Contractor shall dispose of all fluids and other spoils to the requirements of the governing agencies. No drilling mud shall be left on site. Contractor shall provide and maintain sufficient dewatering systems should water be encountered.

## PART 2 PRODUCTS

### 2.01 CASING PIPES

- A. High Density Polyethylene Casing Pipe: Casing material shall be as specified in the Directional Drilling of Water Main section. Casing internal diameter shall be adequate to allow for installation of carrier pipe, but the nominal diameter of the casing shall not be less than twice the nominal diameter of the carrier pipe.
- B. Steel Casing Pipe: Casing material shall be arc welded steel pipe, Grade B or better, meeting the requirements of ASTM A139 with a minimum yield strength of 35,000 psi. Casing internal diameter shall be adequate to allow for installation of carrier pipe, but the nominal diameter of the casing shall not be less than twice the nominal diameter of the carrier pipe. Casing pipe shall be coated with two coats of high build coal tar epoxy per AWWA C-210 for exterior applications, 10-12 dry mils per coat. Casing pipe minimum wall thickness shall be as approved by the governing agencies permitting the crossing but shall not be less than the thickness stated in the table below.

Outside Diameter (inches)	Minimum Wall Thickness (inches)	
	Highways	Railroads *
16	0.250	0.281
20	0.250	0.281
24	0.313	0.313
30	0.375	0.469
36	0.438	0.469
42	0.500	0.562
48	0.500	0.625

\*Meets A.R.E.A. Specifications for Pipelines for Conveying Nonflammable Substances

### 2.02 CASING SPACERS

Provide carrier pipe spacers according to AWWA specifications for each cased crossing. Spacer shell, risers, and fasteners shall be made of T304 stainless steel with PVC liner and ultra-high molecular weight polymer runners to protect the carrier and casing pipe during installation. Spacers shall be as manufactured by Cascade Waterworks or equal.

### 2.03 CASING END SEALS

Provide casing end seals made of 0.093" thick neoprene rubber. End seal shall be in a cone shape with a standard 20" length and fastened to the casing and carrier pipe with stainless steel bands.

## PART 3 EXECUTION

### 3.01 GENERAL

No work shall begin until all permits are obtained and all required bonds, cash deposit, and insurance are furnished to the governing agencies.

### 3.02 JACK AND BORE

Steel casings shall be installed by jack and bore and drilling a hole of a size no larger than one inch in diameter around the outside circumference of the casing pipe. Boring shall be made with an auger inside the casing pipe with the cutting edges positioned just ahead of the pipe. Water-bearing sands and mucky soils shall be well-pointed prior to commencing the bore. Care shall be exercised to keep the auger properly positioned with respect to the casing pipe and maintain forward pressure on the casing to quickly run through any pockets of loose soil. Bore shall be completed with extreme care to maintain line and grade. Proposed line and grade shall be submitted to the Engineer prior to construction. Excessive deviations from the proposed line and grade will not be accepted.

### 3.03 HORIZONTAL DIRECTIONAL DRILL

See Section 02620 Directional Drilling of Water Mains

## PART 4 MEASUREMENT AND PAYMENT

### 4.01 JACK AND BORE – STEEL CASING

Jack and Bore where indicated on the plans shall be measured for payment horizontally from each of the ends of the steel pipe casing. Payment shall include the casing, the water main inside the casing, casing spacers and casing end seals.

### 4.02 OPEN TRENCH – STEEL CASING

Open Trench where indicated on the plans shall be measured on a per linear foot basis. Payment shall include the casing, the water main inside the casing, casing spacers and casing end seals.

### 4.03 HORIZONTAL DIRECTIONAL DRILL

See Section 02620 Directional Drilling of Water Mains

END OF SECTION



SECTION 02640  
WATER SERVICES

PART 1 GENERAL

1.01 DESCRIPTION

This work shall consist of all labor, materials, equipment, tools and services required to furnish and install residential water and small commercial service lines and fittings at locations designated in the Drawings or as directed by the Engineer.

1.02 SPECIFIED ELSEWHERE

Section 02600 Water Mains

PART 2 - MATERIALS

2.01 WATER SERVICE TUBING

Water service tubing shall be polyethylene plastic conforming to ASTM 2737, NSF approved, dimensions to fit standard CTS fittings, SDR 9, 250 p.s.i.

2.02 SERVICE SADDLES

Service saddles shall be ductile iron or brass with double stainless steel bands designed for use with C-900 PVC pipe, outlet tapped with AWWA taper, 200 psig working pressure, one inch tap size conforming to all applicable parts of ANSI/AWWA C-800; Mueller BR25 Series, Ford 202 BS, or approved equivalent. Service saddles are required for all service line connections.

2.03 CORPORATION STOPS AND CURB STOPS

Corporation stops, curb stops and other required service fittings shall conform to AWWA C-800. All connections to service tubing shall be by approved compression type fitting, with stainless steel tubing inserts as recommended by the fitting manufacturer. Curb valves shall employ a one-piece integral plug with full-opening port and tee head, turning on a plastic thrust washer at the top and sealed by an "O"-ring. The valve body shall be a one-piece brass casting with closed bottom. The inlet and/or outlet port shall be sealed by a second "O"-ring. Corporation stops shall be one inch, ground key, taper thread inlet with CTS O.D. outlet.

2.04 SERVICE WYES

Service wyes for single family residential structures and small commercial customers shall be 1"x1"x $\frac{3}{4}$ " brass, compression connection for CTS O.D. tubing on all ends, ANSI/AWWA C-800.

2.05 CURB STOPS

Residential and small commercial curb stops shall be straight, brass with lock wing. 1" compression connection x  $\frac{3}{4}$  inch for single family domestic service, small commercial service and irrigation service. Large commercial meter valves shall be sized to equal line diameter.

2.06 METER BOXES

Meter boxes shall be plastic structural foam boxes with cast iron covers and cast iron hinged reader lid. Box shall measure not less than 10" X 16" (at the top) by 12" deep. Jumbo meter boxes for large commercial water meters shall be furnished and installed

where shown on the plans or designated by the Engineer.

#### 2.07 TRACER WIRE

Tracer wire is required to the meter and shall be installed as specified in Section 02660, Water Mains.

### PART 3 - EXECUTION

#### 3.01 GENERAL

Installation of all service line components (service saddle, corporation stop, tubing, and curb valve) shall be in strict accordance with manufacturer's recommendations.

#### 3.02 EXCAVATION

Excavation, bedding, and backfilling shall be generally in accordance with the requirements given for water main pipe. Installation method shall be "open cut"

#### 3.03 TESTING

Water service lines shall be pressure tested and disinfected in conjunction with the associated water main.

#### 3.04 FLUSHING

Service lines shall be thoroughly flushed upon placing the associated water main into service.

#### 3.05 DEPTH

Service lines shall be laid deep enough to prevent damage from freezing, or during routine road or street maintenance, but not so deep as to require installing the line at an excessive angle in the meter box.

#### 3.06 METER LOCATION

The meter should be located in an obvious, well drained location, but not in driveways, under fences or in flower beds. It should be set with the register in an easily readable position, and clear of the ground within the meter box. The top of the meter box should be set approximately 1/4" above the surrounding ground surface. In all cases, the meter must be set within the meter box with the lid closed.

### PART 4 - MEASUREMENT AND PAYMENT

#### 4.01 WATER SERVICE CONNECTION TO EXISTING METER

Water Service Connections to existing meters shall be measured on a "per each" basis. This pay item shall include all equipment necessary for a completed item of work to include up to 20 feet of tubing items included but not limited to service saddle, corporation stop, tracer wire, tubing stiffeners, wye connector, curb stop, adapters and reducers along with all labor, equipment and materials.

When an existing service is to be connected to a new waterline this pay item shall also include locating the existing service main. The Contractor is hereby advised that locating wire is not present and this may require significant effort.

When existing meter is on the opposite side of the road as the water main, this pay item shall also include locating and connecting to the existing service line on the same side of the road as the water main to eliminate the need of a service line road bore.

#### 4.02 NEW WATER SERVICE CONNECTIONS

Water Service Connections shall be measured on a “per each” basis for either a single service or a double service. This pay item shall include all equipment necessary for a completed item of work to include **up to 20 feet of tubing** items included but not limited to service saddle, corporation stop, tracer wire, tubing stiffeners, wye connector, curb stop, adapters and reducers along with all labor, equipment and materials.

Where a new meter is on the opposite side of the road a Directional Drill Service Tubing will be required as specified in section 02715 Directional Drilling and paid for separately.

#### 4.03 TRANSFER WATER SERVICE TO EXISTING WATERLINE

Transfer Water Service to existing waterline shall be measured on a “per each” basis. This pay item shall include all equipment necessary for a completed item of work to include **up to 20 feet of tubing** items included but not limited to service saddle, corporation stop, tracer wire, tubing stiffeners, wye connector, curb stop, adapters and reducers along with all labor, equipment and materials.

This pay item shall also include locating the existing service main. The Contractor is hereby advised that locating wire is not present and this may require significant effort.

When existing meter is on the opposite side of the road as the water main, this pay item shall also include locating and connecting to the existing service line on the same side of the road as the water main to eliminate the need of a service line road bore.

#### 4.04 WATER SERVICE TUBING

Additional tubing shall be measured horizontally over the installed service line and shall include all open cut footage except the 20 feet included in the pay item for water service connections. Payment shall be made on a “per linear foot” basis and shall include tracer wire, fittings and adapters that are not included in other pay items.

#### 4.05 DIRECTIONAL DRILL SERVICE TUBING

This item will be measured and paid for on a “linear foot” basis as detailed in the plans and specified in Section 02620.

END OF SECTION

SECTION 02650  
TAPPED CONNECTIONS FOR WATER MAINS

PART 1 - SCOPE

1.01 DESCRIPTION

This section covers the connection of water mains using hot tapping procedure.

1.02 SPECIFIED ELSEWHERE

Section 02600	Water Mains
Section 02640	Water Services
Section 02660	Gate Valve Assemblies
Section 02670	Fire Hydrant Assemblies

PART 2 - MATERIALS

2.01 TAPPING SLEEVES

2.01.1 Tapping Sleeve Description

Tapping sleeves shall be all stainless steel type conforming to ANSI/AWWA C-223 and the MSS-SP 124 Standards . Tapping sleeves shall have a full circumferential gasket with flanged outlet.

2.01.2 Tapping Sleeve Material

Where specifically indicated on the drawings as stainless steel, tapping sleeves shall be fabricated from heavy Type 304 stainless steel, with a full circumferential seal to the run pipe provided by a rubber gasket resistant to water, salt solutions, mild acids, gases, and sewage. Multiple stainless steel bolts shall ensure uniform sealing. Outlet flange shall conform with ANSI 150 pound drilling, recessed for tapping valve per MSS-SP 60. A 3/4 inch NPT test plug shall be provided. O.D. range of body must match the actual measured O.D. of the pipe being tapped.

2.02 TAPPING VALVES

2.02.1 Tapping Valve Description

Tapping valves shall conform with the requirements for Gate Valves and Valve Boxes on Water Mains, except that the inlet shall be Class 125 Flange and the outlet, Mechanical Joint. The valve opening shall be oversized to permit a cutter head to pass which is 1/2" smaller than the nominal branch pipe size. Valves shall be furnished complete with cast iron sectional valve box, as is specified under Item for Gate Valves and Valve Boxes on Water Mains. A retainer gland as is specified under Item for Water Pipe & Fittings is required for the connection of the new pipe to the tapping valve.

2.02.2 Gate Valves

Gate valve size shall be the same as the new pipe being installed and not the pipe being tapped.

## PART 3 - EXECUTION

### 3.01 REQUIRED TESTING

It is the intent of this contract that the new segments of water mains be constructed and pressure tested prior to connecting them to existing pipes. Temporary plugs and water service-type connections will be required to allow this. After the new pipe segments are complete and tested, connections will be made to the existing pipes. All abandoned pipes shall be capped.

### 3.02 REQUIRED MEASUREMENTS OF EXISTING DIAMETER

Before each sleeve is installed, the pipe barrel to be tapped shall be located by the contractor and measured. The actual measured pipe O.D. shall be within the range recommended for the sleeve used.

### 3.03 PREPARATION

Installation of tapping sleeves shall fully conform with manufacturer's recommendations. The pipe barrel to be tapped shall be fully and carefully cleaned. Asbestos cement pipe shall be smoothed with a wire brush to ensure a tight seal of the gaskets against the pipe.

### 3.04 TAPPING

The actual size of the hole cut in the pipe barrel shall be not more than 1/2 inch smaller than the nominal size of the branch connection (e.g., not less than 5 1/2 inches for a 6 inch tap). The drilling machine and shell cutter head used shall be specifically recommended for the type of pipe being tapped.

After the tap is complete and the tapping valve closed, the sleeve shall be bled of air and then visually checked for leakage before backfilling.

### 3.05 ADAPTERS

The Necessary adapter fittings, glands, or special gaskets shall be furnished and installed as needed to properly connect to the type of existing pipe or fitting encountered.

### 3.06 RESTRAINT

Contractor shall provide all needed thrust restraint for this construction.

## PART 4 - MEASUREMENT AND PAYMENT

- 4.01 Hot Tap with Valve and Valve Box shall be measured on a "per each" basis and shall include all labor, materials, tapping sleeve, gate valve with flanged for mechanical joint connections, adapters and other equipment necessary for a complete and fully functional tapped connection with gate valve. No additional payment will be made for thrust restraint or backfilling with compacted onsite material.

END OF SECTION

SECTION 02660  
GATE VALVE ASSEMBLIES

PART 1 - GENERAL

1.01 DESCRIPTION

This work shall consist of all labor, materials and equipment required for furnishing and installing valves and valve boxes on water mains in accordance with these specifications and/or as detailed in the Drawings.

1.02 SPECIFIED ELSEWHERE

Section 02600 - Water Mains

Section 02650 – Tapped Connections for Water Mains

Section 02670 - Fire Hydrant Assemblies

PART 2 – MATERIALS

2.01 GATE VALVES

Gate valves shall be of the "resilient seat" type, conforming to AWWA C-509, epoxy coated inside to AWWA C550. End connections shall be mechanical joint, except that valves used in fire hydrant stubs and hot taps shall be flange by Mechanical Joint. Valves shall be rated for zero leakage to 200 p.s.i., and 400 p.s.i. hydrostatic test pressure. Valves shall be of the non-rising stem (NRS) design. Gates shall be encapsulated in rubber where exposed to line velocity and shall be field replaceable. Each valve shall have a 2 inch square operating nut and shall open to the left. Retainer glands shall conform with the requirements specified for water main pipe.

Gate valves shall comply with NSF/ANSI/CAN 61 and NSF/ANSI/ 372 as required for limiting lead content in accordance with the Safe Drinking Water Act.

2.02 VALVE BOXES

Valve boxes shall be supplied for all buried valves. Valve boxes shall be made of good quality cast iron and shall be of the sectional type. The lower section shall be a minimum of five (5) inches in diameter, enlarged to fit around the bonnet of the valve if a two section box is used, or to fit a circular or oval base section of a three section box is used. The upper section shall be arranged to slide or screw down over the adjoining lower section and shall be provided with cast iron lids or covers marked "WATER".

2.03 CONCRETE

Concrete shall be Class B, MDOT Standard Specifications.

2.04 REINFORCING STEEL

Bar reinforcement shall be Grade 40 or grade 60 billet steel conforming to ASTM A-615.

## PART 3 – CONSTRUCTION REQUIREMENTS

### 3.01 GATE VALVES

Gate Valves shall be installed as detailed in the Drawings and in strict accordance with manufacturer's recommendations.

### 3.02 VALVE BOXES

Valve Boxes shall be installed as detailed in the Drawings and in strict accordance with manufacturer's recommendations.

### 3.03 RETAINER GLANDS

Installation of restrained joint retainer glands shall be as specified for water main pipe. Installation of thrust blocks will be as detailed in the Drawings.

## PART 4 – MEASUREMENT AND PAYMENT

### 4.01 GATE VALVE ASSEMBLY

This pay item shall be measured on a "per each" basis and shall include gate valve and all labor, equipment, materials required for a complete and fully functional final product. This pay item shall include joint restraint for mechanical joint valves, cast iron valve box for buried valves, and concrete valve box ring in unpaved areas. Pavement repair and granular base if required shall not be included but shall be a separate pay item.

END OF SECTION

SECTION 02670  
FIRE HYDRANT ASSEMBLIES

PART 1 GENERAL

1.01 DESCRIPTION

This work shall consist of the furnishing of all labor, materials, equipment, and testing to install dry barrel fire hydrants in accordance with these specifications and/or as detailed in the Drawings. The 6" water main, the 6" gate valve, joint restraint, and all other materials are included under this item.

1.02 SPECIFIED ELSEWHERE

Section 02600	Water Mains
Section 02650	Tapped Connections for Water Mains
Section 02660	Gate Valve Assemblies

PART 2 - MATERIALS

2.01 FIRE HYDRANTS

2.01.1 Type

All fire hydrants shall be dry barrel type that comply with AWWA C-502. Fire hydrants shall be of the compression type closing with the line pressure.

2.01.2 Requirements

The main valve size shall be 5 1/4 inch.

The friction loss through the hydrant shall not exceed 2.5 p.s.i. at 1,000 GPM flowing through the pumper nozzle.

Hydrants shall comply with NSF/ANSI/CAN 61 and NSF/ANSI/ 372 as required for limiting lead content in accordance with the Safe Drinking Water Act.

2.01.3 Lubrication

The bonnet section of all hydrants shall be designed so the bearing surfaces and stem threads are sealed in a cone shaped lubricant reservoir and automatically lubricated each time the hydrant is operated.

2.01.4 Shoe

The hydrant shoe shall have at least two drain outlets. Size of shoe shall be 6 inches and of the mechanical joint type. A retainer gland as specified for water main pipe is required.

2.01.5 Nozzles

Hydrants shall be furnished with two 2 1/2 inch hose nozzles and one 4 1/2 inch pumper nozzle. The type and size of threads shall be National Standard. The distance from the ground line to the center line of the pumper nozzle shall be not less than 17 inches, nor more than 26 inches. The operating nut shall be pentagonal, 1 1/2" from point to flat, and shall open in the counter-clockwise direction.

2.01.6 Break Away Connection

Hydrants shall be furnished with a breakable feature designed to break cleanly 2 inches above the ground line upon contact. This feature shall consist of a two part breakable safety flange with a torque diverting breakable stem coupling. Flangible bolt construction will not be accepted.



2.01.7 Top Extension Design

The design of the hydrant shall permit easy installation of top extensions and a full 360 rotation of the upper barrel without shutting off the water.

2.02 CONCRETE

Concrete shall be Class B, MDOT Standard Specifications.

2.03 REINFORCING STEEL

Bar reinforcement shall be Grade 40 or grade 60 billet steel conforming to ASTM A-615.

2.04 GRAVEL

Gravel shall be crushed stone or washed pit run gravel.

PART 3 - CONSTRUCTION REQUIREMENTS

3.01 GENERAL

Hydrants shall be installed as shown in the detailed drawings and in a manner that will provide complete accessibility and will prevent damage from vehicles. All hydrants shall be vertical and shall have their pumper connections at right angles to the roadway or property line if there is no roadway.

3.02 TESTING

Hydrants shall be tested in accordance with the testing requirements for water mains.

3.03 DRAINAGE

Crushed stone or gravel shall be placed at the base of the hydrant to provide drainage.

3.04 PAINTING

After installation and prior to final acceptance the fire hydrants shall be painted above the ground line in accordance with AWWA Standard C-502. Multiple coats may be required to achieve uniform appearance if the hydrants are supplied by the manufacturer in a different color than desired.

3.05 GATE VALVE

A gate valve shall be installed with each fire hydrant and shall be located on the hydrant stub as detailed in Drawings, complete with cast iron valve box.

3.06 DEPTH ADJUSTMENT

Some hydrants may require bury depths greater than the standard 36 inches due to existing utility lines and/or roadside ditches. Contractor is advised that a number of the hydrants may require greater than normal depth, Contractor shall visit each site prior to bidding the project to determine if each installation will require greater than normal depth and bid accordingly.

PART 4 - MEASUREMENT AND PAYMENT

4.01 FIRE HYDRANT ASSEMBLIES

Fire hydrant assemblies shall be measured on a "per each" basis and shall include the demolition and removal of the existing fire hydrant, and the installation of the gate valve, cast iron valve box, 6" diameter PVC pipe, mechanical joint tee on the water main, reducers, joint restraint, precast valve box ring and all labor, equipment, materials required for a complete and fully functional final product.

END OF SECTION

FOR VIEWING ONLY  
NOT FOR BIDDING PURPOSES

SECTION 02680  
TESTING FOR PRESSURE PIPING

PART 1 - GENERAL

1.01 DESCRIPTION

This work shall consist of all labor, materials, equipment, tools and services required to perform pressure and leakage testing on water mains.

1.02 SPECIFIED ELSEWHERE

Section 02600            Water Mains

PART 2 - MATERIALS

NONE

PART 3 - EXECUTION

3.01 PRESSURE TEST

3.01.1 Scope

All water mains, water services, blow off assemblies and fire hydrant assemblies shall be pressure tested.

3.01.2 Required Standards

Pressure and leakage tests shall be completed in conformance with AWWA C-600, Section 4, latest revision, and in the presence of the Engineer or his representative.

3.01.3 Flushing

All piping shall be thoroughly flushed prior to pressure testing. The Contractor shall advise and coordinate flushing of water mains with the Engineer or his representative. Flushing shall be performed in a manner that will not result in less than acceptable water pressure in the existing system. In case of fire or emergency, Contractor shall temporarily cease flushing operations.

3.01.4 Water Main Test Pressure

Test pressure for water mains shall be at 100 psi or 1.5 times the working pressure at the highest point along the test section whichever is greater.

3.01.5 Test Limitations

Test Pressure shall not exceed pipe or thrust-restraint design pressures. Test pressure shall not exceed twice the rated pressure of the valves or hydrants when the pressure boundary of the test section includes closed gate valves or hydrants.

Valves shall not be operated in either direction at differential pressure exceeding the rated pressure.

3.01.6 Hydrant Testing

When hydrants are in the test section, the test shall be made against the closed hydrant.

3.01.7 Test Duration

Test duration shall be 4 hours or longer.

### 3.01.8 Test Performance

Test pressure shall not decrease by more than  $\pm 5$  psi (0.35 Bar) for the duration of the test.

### 3.01.9 Pressurization

Each valved section of pipe shall be filled with water slowly and the specified test pressure shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Engineer. The Contractor shall allow the test section to stabilize at the test pressure before conducting the leakage test.

### 3.01.10 Air Removal

Before applying the specified test pressure, air shall be expelled completely from the pipe, valves and hydrants. Contractor shall install corporation cocks at high points so that the air can be expelled as the line is filled with water. After all the air has been evacuated, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the pressure test, the corporation cocks shall be removed and plugged or left in place at the discretion of the Engineer.

### 3.01.11 Examination

Any exposed pipe, fittings, valves, hydrants and joints shall be examined carefully during the test. Any damaged or defective pipe, fittings, valves or hydrants that are discovered following the pressure test, shall be repaired or replaced with sound material, and the test shall be repeated until it is satisfactory to Engineer.

## 3.02 LEAKAGE TEST

### 3.02.1 General

The leakage test shall be conducted concurrently with the pressure test. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or any valved section thereof, to maintain pressure within 5 psi (0.35 Bar) of the specified test pressure after the air in the pipeline has been expelled and the pipe has been filled with water. Leakage shall not be measured by a drop in pressure in a test section over a period of time.

### 3.02.2 Allowable Leakage

No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = [SD(P)^{0.5}] / 133,200$$

in which L is the allowable leakage, in gallons per hour; S is the length of pipe tested, in feet; D is the nominal diameter of the pipe, in inches; and P is the average test pressure during the leakage test, in pounds per square inch gauge. This formula is based on an allowable leakage of 11.65 gpd, per mile, per inch nominal diameter, at a pressure of 150 psi.

### 3.02.3 Valve Leakage

When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gal/hr/inch of nominal valve size shall be allowed.

3.02.4 If any test of pipe laid discloses leakage greater than the allowable leakage, the Contractor shall, at his own expense, locate and make repairs as necessary until the leakage is within the specified allowance.

3.02.5 All visible leaks are to be repaired regardless of the amount of leakage.

#### PART 4 - MEASUREMENT AND PAYMENT

4.01 Flushing of Water Mains prior to pressure testing shall not be measured for separate payment but shall be a subsidiary item to water main construction.

4.02 Pressure testing shall not be measured for separate payment but shall be a subsidiary item to water main construction.

END OF SECTION

FOR VIEWING ONLY  
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SECTION 02690  
GROUTING OF WATERLINES

PART 1 - GENERAL

1.01 DESCRIPTION

This item will cover sealing of abandoned water mains by completely filling the water lines with flowable fill. The terms "grout" and "flowable fill" shall be considered synonymous in these specifications and are used interchangeably. The term "grouting" shall refer to the action of pumping grout / flowable fill into abandoned water lines to completely fill the line. The term "sealing" shall be considered synonymous to grouting.

1.02 SUBMITTALS

The Contractor shall provide the following items prior to the start of any construction on this project.

- Flowable Fill Mix Design
- Manufacturers data for proposed plugs and detail of bulkhead
- Technical information for equipment and operations including injection rate, grout pressure, method of controlling grout pressure, bulkhead and vent design and maximum length between injection points.

PART 2 - PRODUCTS

2.01 FLOWABLE FILL

Cement-based grout shall be used for flowable fill. The grout slurry shall be self-leveling and have non-shrink characteristics.

Unconfined compressive strength shall be a minimum of 100 psi at 56 days as determined based on average of three tests for same day's batch.

PART 3 - EXECUTION

3.01 CONSTRUCTION SEQUENCE

Abandoning and grouting of water lines must not occur until all existing water flow and service connections have been transferred to a new water line or another existing water line as designated in the Project Plans. The Contractor will be responsible for the satisfactory coordination of the pipe abandonment.

3.02 APPURTENANCE REMOVAL

The Contractor shall remove all water line appurtenances, such as hydrants, valves and valve boxes and castings. These appurtenances must be returned to the owner of the water system at a location designated by the Engineer.

3.03 PREPARATION FOR GROUTING

The contractor shall cut the abandoned water line as needed. Bulkhead fittings shall be installed as required to attach the grout hose to the water line with no leaks. Vents shall be constructed downstream of grout to allow for air and/water release. Remove any free standing water prior to starting fill placement.

### 3.04 GROUTING PROCEDURE

Place grout/flowable fill using concrete or grout pumps capable of continuous delivery at planned placement rate to fill volume between placement points not to exceed 500 linear ft. at a time. Pump flowable fill through a bulkhead fitting into the water line to be abandoned.

Place grout under pressure into property vented open system until grout emerges from vent pipes indicating pipe is completely filled. Pumping grout must be completed under sufficient pressure to overcome friction and to fill water main from downstream to upstream end.

Upstream end of line shall be the location of grout introduction. If there is an elevation change of over three feet then grout shall be introduced at the lower elevation and pumped to a higher elevation.

The Contractor shall remediate areas where flowable fill did not fill voids in water main by pressure grouting from inside water main or from surface if necessary. Plug each end of the water main being abandoned. Ensure that concrete is around plug/bulkhead and around pipe including bedding area such that it is not penetrable by groundwater and that bedding at this location is not a conduit for groundwater. The method of installation must be able to meet the requirement of completely filling the existing water main.

### 3.05 RESTORATION

After grouting has been completed the Contractor shall backfill all excavated and/or rutted areas to existing grade. Backfill shall be compacted in accordance with these specifications. Unpaved areas that have been disturbed shall be fertilized, seeded and mulched unless sodding is designated.

### 3.06 FINAL CLEANUP

Remove, transport, and, dispose of spoils and debris at a suitable offsite location.

## PART 4 – MEASUREMENT AND PAYMENT

### 4.01 MOBILIZATION OF GROUTING EQUIPMENT

Mobilization and demobilization of grouting equipment shall not be a separate pay item unless specifically indicated on the bid documents.

### 4.02 GROUTING

Payment for grouting shall be on a per linear foot basis including all pipe diameters and depths. Payment shall include all labor, equipment and materials required to locate the water line to be grouted, excavate as required, divide the line into segments no longer than 500 feet, attach the bulkhead fitting, construct a vent, grout the line, backfill excavated areas, dispose of excess grout/flowable fill, restore all disturbed areas and any other item required for a complete and fully sealed water line and a restored project site.

END OF SECTION

SECTION 02800  
CHLORINATION PUMP

PART 1 GENERAL

1.01 DESCRIPTION

This work shall consist of the furnishing of all labor, materials, equipment, and testing to install a multi-stage chlorination system pump in accordance with these specifications and/or as detailed in the Drawings.

PART 2 MATERIALS

2.01 PUMP

Type: All chlorination system pumps shall be multi-stage type with the following characteristics.

- Construction: Standard cast iron for general service or stainless for filtration applications.
- O-Ring Casing Seal: Reliable high pressure sealing with easy disassembly for maintenance or repair.
- Impellers and Diffusers: Glass filled engineered composite material with a fixed impeller design. High resistance to corrosion and abrasion.
- Bowls: 300 stainless steel rabbit lock for positive alignment with no gaskets required.
- Variable Capacity: Centrifugal pump design permits selection of flow within a range for each size.
- Mechanical Seal: A variety of face materials and elastomers to match application needs.
- Maximum suction (inlet) pressure: 75 PSI.
- Maximum Liquid Temperature: 160° F (71° C).
- Maximum lift with foot valve: 10 ft., check NPSH curve.
- Close coupled NEMA 56J motors in open drip proof or totally enclosed design.
- NEMA standard 56J frame.
- Open drip proof or totally enclosed fan cooled enclosures available as standard. Consult factory for other options.
- 60 Hz, 3500 RPM. 230v Three phase
- Three phase motors shall have Class 20 overload protection provided in starter unit.

PART 3 CONSTRUCTION REQUIREMENTS

3.01 GENERAL

Chlorination pumps shall be installed as shown in the detailed drawings and in a manner that will provide convenient accessibility.

3.02 STARTUP

Pumps shall be operated by the Contractor's qualified representative who shall demonstrate performance and maintenance for the Owner's representatives.



3.03 PIPING

Chlorination pumps shall be connected to the chlorination system using schedule 80 PVC piping.

PART 4 MEASUREMENT AND PAYMENT

- 4.01 Chlorination pumps shall be measured and paid on a lump sum basis and shall include all labor, equipment, materials, reducers and all other items required for a complete and fully functional final product. Motor starter, 3 phase wiring and other electrical components associated with the chlorination pump shall be included in this pay item.

END OF SECTION

FOR VIEWING ONLY  
NOT FOR BIDDING PURPOSES

SECTION 02820  
MASTER METERS

PART 1 - GENERAL

1.01 DESCRIPTION

This work shall consist of all labor, materials and equipment required for furnishing and installing turbine type master meters for potable water service.

1.02 SPECIFIED ELSEWHERE

Section 02600 - Water Mains  
Section 02640 – Water Services  
Section 02650 – Tapped Connections for Water Mains  
Section 02660 – Gate Valve Assemblies  
Section 02670 - Fire Hydrant Assemblies  
Section 02680 – Testing for Pressure Piping

PART 2 – MATERIALS

2.01 MASTER METERS

Type: Meters shall be of the inline horizontal-axis turbine type per AWWA C701 Class 2 meeting the lead-free provisions of the Safe Drinking Water Act. Meters shall be certified to NSF/ANSI 61 and NSF/ANSI 372 requirements.

Case and Cover: The main case and cover shall be cast from NSF/ANSI 61 and NSF/ANSI 372 certified lead free alloy containing a minimum of 85% copper. The size, model, NSF certification and arrows indicating direction of flow shall be cast in raised characters on the main case or cover. The cover shall contain a calibration vane for the purpose of calibrating the turbine measuring element while the meter is inline and under pressure. The calibration vane shall be mounted under the register or shall be covered by a protective cap that is attached in a tamper-resistant device.

Spindle and Shaft: The turbine spindles shall be stainless steel; turbine shafts shall be tungsten carbide.

Intermediate Gear Train: The intermediate gear train shall be directly coupled to the turbine rotor and magnetically coupled to the register through the meter cover. All moving parts of the gear train shall be made of a self-lubricating polymer or stainless steel for operation in water.

Accuracy: Registration accuracy over the normal operating range shall be 98.5% to 101.5%.

Connections: End connections shall be flanged joint.

2.02 DIGITAL ENCODER

Digital encoders shall be manufactured to connect to the flow meter's standard magnetic drive. The encoder shall display flow rate in gallons per minute and totalized flow in thousands of gallons. The encoder shall generate a 4-20 ma signal that is compatible with SCADA equipment. The encoder shall be fully sealed and impervious to moisture intrusion. Power for the encoder shall be provided by a long life battery with a rated service life of 10 years or longer.

## 2.03 BOLTS

Casing bolts shall be made of AISI Type 316 stainless steel.

## 2.04 STRAINER

Potable water strainers shall be cast iron wye type having 1/8" strainer openings for a 6" diameter size. Strainers smaller than 6" shall have 1/16" strainer openings. Strainers shall have a 304 stainless steel perforated screen, a cast iron flanged retainer cap and a drain blow off connection furnished with a closure plug. The strainer shall also have a double coated, heat fused epoxy coating or other equally durable coating on its interior.

## PART 3 – CONSTRUCTION REQUIREMENTS

### 3.01 MASTER METER

Master meters shall be installed as shown in the Drawings and in strict accordance with manufacturer's recommendations. Piping connected to the master meter shall be horizontal with no fittings within the uninterrupted distance of at least 10 inside pipe diameters upstream and 5 inside pipe diameters downstream.

### 3.02 DATA CONNECTION

Master meters shall be equipped with a digital encoder and shall be connected to the SCADA system through a data cable recommended for the type of service required to convey a clear, accurate signal to the SCADA RTU. Above ground cable shall be enclosed in conduit. Cable used for direct bury shall be rated for such duty.

### 3.03 STRAINER

Strainers shall be installed as indicated on the project drawings. Strainers shall be oriented to provide the most convenient access to the internal screen for removal and cleaning.

## PART 4 – MEASUREMENT AND PAYMENT

### 4.01 PIPING MODIFICATION AND ABOVE GROUND MASTER METER

This pay item shall be measured on a "lump sum" basis and shall include all items as depicted on the plans and details for this item of work.

### 4.02 DIGITAL ENCODERS

Digital encoders for master meters shall be measured as part of the "lump sum" bid item "RTU, Sensors, Digital Encoders and Wiring for each Tank Site". It shall include determining the type of equipment required to be compatible with the master meter. Payment shall also include all labor, equipment and material required to construct a complete and fully functional final product.

### 4.03 PRESSURE GAUGE AND HOSE BIB

The three (3) pressure gauges and two (2) threadless hose bibs as called for in the plans and details shall not be measured for separate payment but shall be a subsidiary to pay item 4.01 "Piping Modification and Above Ground Master Meter" even though some are to be installed at Tank Site Number 2.

END OF SECTION

SECTION 02900  
DUPLEX BOOSTER PUMP UNIT

PART 1 - GENERAL

1.01 DESCRIPTION

The Contractor shall provide all labor, materials, equipment, and testing to construct the booster pump unit in accordance with these specifications, manufacturer's recommendations and as detailed in the Drawings.

1.02 ELECTRICAL POWER

The pump specified in this section requires three phase electrical power which may not be available at the project site. The booster pump station shall therefore include equipment to convert single phase power to three phase power. This equipment shall be included as a component of the booster pump station.

PART 2 - MATERIALS

2.01 PUMPS

2.01.1 OPERATING CONDITIONS

Each inline pump shall be designed to handle water free of suspended solids rated 7.5 HP, 230volts, 3-phase, 60 hertz, and 3450RPM. Each pump shall be direct coupled and produce 66 U.S. GPM at 80 psi., with a minimum pump energy index (PEI) of 1.0. The pump shall be non-overloading throughout the entire range of operation without employing service factor. The Contractor shall submit a performance curve for approval which shall state in addition to head and capacity performance, Net Positive Suction Head Require (NPSHr), the pump efficiency and impeller size.

2.01.2 PUMP DESIGN

The pump shall be a non-self-priming multistage pump coupled to a standard NEMA ODP/OPSB continuous duty high efficient motor. The pump volute, casing, impeller, diffuser bowl shall be AISI 304L or 316L stainless steel. The pump shall conform to NSF-61 for potable water applications.

Pump casing shall be laser welded AISI 304L or 316L stainless steel and capable of withstanding a minimum maximum working pressure of 360psi. Pump shall be of the inline type and shall be compatible with ANSI raised faced flanges.

Wear rings composed of Polyphenylene Sulfide (PPS) Plastic shall be provided in each stage. Wear rings shall be self-centering and of the replaceable design to ensure long service life.

Impellers shall be of the enclosed design and constructed of AISI 316L or AISI 304L stainless steel. Impellers shall provide internal thrust balance in each stage.

Diffuser Bowl- Each stage shall have a bowl with attached diffuser and be constructed of AISI 340L or 316L stainless steel.

Seal Housing shall be of concave design and shall hold the seal faces below the topmost part of the pump casing.

Seal- Shall be of a standard design and shall be removable from the pump for

replacement without disturbing the pump body. Seal shall be equipped with a carbon rotating face vs a silicon carbide stationary face with elastomers of Viton or EPR. Seal shall be in accordance with ISO-3069 & EN-12756.

Pump shaft sleeves shall be made of tungsten carbide with ceramic bearings. Shaft stick up shall be set with a standard spacer from the factory.

Suction & Discharge Spools shall be one-piece cast iron, class 30 and shall be ANSI flanged with one (1) 1-1/4" air release port and one (1) 1/4" gauge port

### 2.01.3 MOTOR

The pump drive motor shall be NEMA standard design Three-Phase Cast (TC) frame. Motor shall be of standard manufactures catalog design and must not use special bearings as a thrust handling device. Motors shall have ODP/OPSB enclosure and be continuous duty high efficient. Motors shall be UR, CSA and CSA EEV listed. The stator windings shall have Class F insulation and be designed for inverter duty.

### 2.01.4 TESTING

Factory testing shall be required and include the following:

1. The pump shall be visually inspected to confirm that it is built in accordance with the specification as to HP, voltage, phase and hertz.
2. The motor seal and housing chambers shall be tested for moisture content or insulation defects.
3. Certified Test Curve- Non-Witnessed Hydraulic Institute Performance Test showing conditions of service as specified above. Curve shall be submitted to engineer for approval prior to shipment.

## 2.02 PUMP CONTROLS

### 2.02.1 GENERAL

Contractor shall provide control panels, transformers and all associated electrical to assure system integration.

### 2.02.2 CONTROL EQUIPMENT

Pumps shall be controlled by pressure switch on hydropneumatic tank.

### 2.02.3 THE DUPLEX BOOSTER PUMPS SHALL FUNCTION AS FOLLOWS:

1. On pressure drop to pre-set (adjustable) level, lead pump will start. With lead pump operating, if pressure continues to drop to pre-set (adjustable) low level second pump will start. Otherwise known as lead – lag.
2. Pump(s) will run until pre-set pressure is met (adjustable) then they will shut off.
3. At next start lag pump will alternate as lead pump. Otherwise known as lead – lag and alternating.
4. If one pump should fail second pump shall override control.
5. Panel shall be equipped with low suction switch cut off to prevent equipment damage.

## 2.02.4 ELECTRICAL COMPONENTS

### 2.02.4.1 GENERAL

All electrical components and materials supplied shall function as a complete unit to automatically control the duplex booster pumps. All devices and material shall be new and of standard product design. All components used in the panel shall be Underwriters' Laboratory approved for the application. Electrical work shall be in accordance with the latest edition of the National Electrical Code (NEC-70).

### 2.02.4.2 WIRE

Wire shall be stranded copper and sized as required for load and application according to NEC. All wiring on the rear of the inner door shall be neatly bundled using tie wraps or other means. All internal wiring on the backplate shall be neatly routed in wire duct with removable covers. All wiring shall be continuous point to point (no splices) and be totally accessible.

- i. All conductors shall be 98% conductive annealed copper unless otherwise note, UL listed and labeled.
- ii. Conductors No. 10 and smaller shall be solid.
- iii. Conductors No. 8 or larger shall be stranded.
- iv. Branch circuits shall not be less than No. 12 copper wire type THW, THHN or THWN insulation
- v. All control and signal wire shall be a minimum of No. 14 AWG, 90-degree C insulated and color-coded, colors shall be as follows:
  - a. Red for all AC control
  - b. Blue for all DC control
  - c. Yellow for external source control
  - d. White for AC neutral
  - e. Green for equipment ground wiring
- vi. Main Ground- Conductors for main ground form neutral bus or equipment grounding bus shall be bare copper.

### 2.02.4.3 PRESSURE TRANSDUCER

A pressure transducer shall be furnished and installed in the piping of the pump station and shall be prewired. Transducer shall be two wire type with a 4-20mA signal calibrated for 0 -300psig. Shall be of the NEMA -4X design and equipped with a ½" NPT male process connection (fluid) and a ½" NPT male electrical connection. Accuracy shall be +/- 1.5%. Diaphragm shall be 17-4PH stainless steel and case shall be 304 stainless steel.

### 2.02.4.4 LOW SUCTION SWITCH

A Low Suction Switch shall be factory set and of the diaphragm type

### 2.02.4.5 ENCLOSURE

Duplex Control Panel (DCP) enclosure shall be NEMA-1. VFD enclosures shall be NEMA-1 as provided by the drive manufacturer.

### 2.02.4.6 H-O-A SWITCHES

Each pump shall be equipped with HAND-OFF-AUTOMATIC (H-O-A) switches.

### 2.02.4.7 PUMP DISCONNECT

Provide one (1) properly sized fused disconnect per pump. Provide one set of spare fuses per pump.

#### 2.02.4.8 CIRCUIT BREAKERS

The Main Circuit Breaker shall be properly sized for pump station load and shall be Square-D QOU or equal. Branch Circuit Breakers shall be properly sized for load and shall be Square-D QOU or equal.

#### 2.02.4.9 ACCESSORIES

- 1) At a minimum, the DCP shall be equipped with:
  - One (1) Enclosure heater circuit
  - One (1) Enclosure blower/vent fan circuit
- 2) Time Delay Relay shall be properly sized to prevent both pumps from starting at once.
- 3) Repeat Timer shall be properly sized to prevent pumps from short starting after stop.
- 4) Control Relays shall be provided.
- 5) DCP shall be equipped with a manual override alternator.
- 6) Lightning Arrestor- Pump station shall be equipped with one (1) properly sized lightning arrestor on the feed power.
- 7) Convenience switches shall be provided.
- 8) Pump Run Lights- DCP shall be equipped with one (1) green run light per pump.
- 9) Pump Fault Lights- DCP shall be equipped with one (1) red pump fault light per pump.
- 10) Common Alarm Light- DCP shall be equipped with one (1) red common fault light.
- 11) Thermostat- DCP shall be equipped with a thermostat to control pump station vent fan.
- 12) Main Power Distribution Block- DCP shall be equipped with a properly sized incoming power distribution block.
- 13) Space Heater- Fiberglass enclosure shall be equipped with a 1500W forced air space heater 120V/60Hz/1pH.
- 14) Exhaust Fan- Fiberglass enclosure shall be equipped with a 120CFM exhaust fan on simplex enclosures and a 300CFM exhaust fan on duplex and larger enclosure. Motors shall be 120V/60Hz/1pH and will be controlled by thermostat in 1.7.S.
- 15) Control Transformer- On applications needing step-down transformer it shall be supplied and mounted on the control panel hoop. Transformer shall be properly sized for load and shall be UL-listed UL-3R enclosure with 180-degree C insulation system with 115-degree C rise. Shall be of the encapsulated design.
- 16) Grounding lugs- Booster pump system shall be provided with two grounding lugs. One shall be in the DCP with a secondary lug located on the baseplate. Lugs shall be manufacturer standard.
- 17) Conduit- All conduit shall be of the flexible liquid-tight type or PVC NEC approved
- 18) All electrical wiring shall be per NEC-70.

#### 2.02.5 BASEPLATE AND PIPING

##### 2.02.5.1 BASEPLATE

Baseplate shall be a minimum of 4" channel steel which shall meet or exceed A-36 requirements. The design of all members shall be in accordance with AISC Steel construction Manual (13<sup>th</sup> edition).

### 2.02.5.2 PIPING

- 1) Pipe & Spools- Shall be 304 Stainless steel and shall conform to NSF-61.
- 2) Fittings- 2" and smaller shall be NSF-61 compliant NPT threaded stainless steel or bronze. For 2-1/2" and larger all mainline pipe fittings shall be cement lined ductile iron conforming to ASTM A536 and ANSI/AWWA C104/A21.4. Shall be rated for 250psi.
- 3) Suction & Discharge Headers- for 2" and smaller shall be NPT threaded of stainless-steel NSF-61 compliant. For 2-1/2" and larger headers shall be 304 stainless steel or cement lined ductile iron and shall be NSF-61 compliant. Flanges shall be ANSI class 150/300 raised or flat face flanged. Rating & Size shall be determined by discharge pressure as indicated in 1.2 above.
- 4) Isolation Valves- All valves shall be NSF-61 compliant. Isolation valves 2" and smaller shall be ball valves and shall be manufacturers choice. Isolation valves 2-1/2" and larger shall be capable of drop tight service to 250 psig. 2-1/2" and larger valves shall be full rated for bi-directional dead-end service and at a minimum these shall be equipped as:
  - a) Valve body shall be cast iron ASTM A126 Class B wafer lug style drilled and tapped for class 150 flanges.
  - b) Body shall have integrally cast top plate for direct flush mounting of a manual actuator.
  - c) Seat shall be molded in isolating body, steam and journal from water flow. Seat shall be EPDM.
  - d) Disc shall be 304 stainless steel with polished edges.
  - e) Valve stem shall be one piece 416 stainless steel.
  - f) Upper and Lower stem bearing shall be bronze.
  - g) Valve shall be DelVal or equal.
- 5) Pressure Gauges- NSF-61 compliant suction and discharge pressure gauges shall be provided. Gauges shall have a 4" minimum diameter face. Gauges shall have 1/4" NPT connections located at the bottom of the gauge. Suction gauge shall be in 10psi intervals with graduation marks every 1psi. Discharge gauges shall be in 20psi intervals with graduation marks every 2psi.
- 6) Check Valves- for 2" and smaller shall be provided with NPT threaded stainless, bronze or iron NSF-61 compliant swing check valves. 2" and smaller valves shall be manufacturer standard. For 2-1/2" and larger mainline piping shall be supplied with either a wafer style or a globe style check valve that is NSF-61 compliant with ASTM A126 Class B cast iron bodies and ASTM B584/B148 bronze and shall be manufactured by Val-Matic or equal.

### 2.02.5.3 PAINTING

Surfaces receiving paint shall be sandblasted to a bright metal appearance per SSPC-SP6 and shall include the removal of all rust, mill scale and other foreign materials. Painting operation shall take place immediately after surface preparation. Paint shall be a two-part high solids self-priming epoxy suitable for marine applications shall be PPG Amerlok-2 or equal. A minimum of two-coats shall be applied for a final 6-12mil dry thickness.



#### 2.02.5.4 NAME PLATES

Booster Pumps shall receive a stamped aluminum nameplate with serial number and contact information. Nameplate shall be located on the front for DCP and shall be in high visibility green over silver.

#### 2.02.6 ENCLOSURE

The duplex booster pump enclosure shall be molded fiberglass construction, factory pre-assembled to make a bonded unit with no external seams or joint covers. The walls and roof shall be integral. There shall be a three (3) inch wide external mounting flange around the entire lower perimeter.

The walls and roof shall be of sandwich construction consisting of 1/8<sup>th</sup> inch thick fiberglass skins and one (1) inch thick rigid polyisocyanurate foam core (R value = 6.7) The door shall be of fiberglass sandwich construction 1-3/4 inches thick.

The fiberglass laminate shall consist of polyester resin reinforced with a minimum of 25% by weight E-Glass. The minimum physical properties of the laminate shall be:

- Tensile Strength            14,000 psi                    (ASTM D638)
- Flexural Strength        25,000 psi                    (ASTM D790)
- Flexural Modulus        1,000,000 psi                (ASTM D790)

The enclosure shall be designed to withstand wind loads in accordance with the universal building code (UBC)

The exterior and interior of the enclosure shall be finished in white polyester gel coat.

The enclosure shall be furnished with the following standard equipment and accessories:

- Pre-wired using 12-gauge wiring in UL listed non-metallic flexible, liquid tight conduit.
- 125A, main lug, 8 branch circuit panel in NEMA 3R thermoplastic enclosure
- Duplex outlet (115V)
- Interior vapor-resistant light.
- Non-metallic intake or exhaust fan with screened hood.
- Outside weatherproof switch for fan and light.
- Fixed ventilation louver.
- Locking doorknob.
- Cadmium plated lifting eye.
- Door gasket.
- Spring cushioned crash stop on door.
- Fiberglass awning above door
- Equipment mounting board laminated in wall with FRP.
- 1" Polyisocyanurate foam core

The supplier shall submit engineering drawings for approval. As a minimum, the drawings shall show the configuration of the enclosure with overall dimensions, location of the door, louver, fan, equipment board and electrical components.

## 2.02.7 DUPLEX BOOSTER PUMP FOUNDATION

The duplex booster pumps shall be installed by the contractor on a reinforced concrete slab constructed as indicated on the project plans. Prior to installing subbase, contractor shall provide written documentation that the subgrade material has been approved by an independent testing lab and the Engineer of Record as being non-yielding or pumping and also that it is free of all excessive clay, silt, roots or organic material.

The Contractor shall provide engineer with one (1) passing density on the subbase and one (1) passing density on the base, prior to concrete construction.

## PART 3 - CONSTRUCTION REQUIREMENTS

### 3.01 STARTUP

Pump operation shall be demonstrated by the Contractor's qualified representative who shall demonstrate performance and maintenance for the Owner's operators. O&M manuals shall be supplied. These manuals shall describe maintenance requirements, replaceable parts, pump operating curve and other items required for proper pump performance.

### 3.02 PIPING

Booster pumps shall be connected to the water system using piping that complies with water distribution system specifications.

## PART 4 - MEASUREMENT AND PAYMENT

### 4.01 DUPLEX BOOSTER PUMP UNIT, ENCLOSURE, AND FOUNDATION

The duplex booster pump unit shall be measured on a lump sum basis and shall include pumps, enclosure/shelter, electrical, piping, foundation, accessories and all other needed equipment for a complete functional unit.

### 4.02 BOOSTER STATION CONTROLS

Booster Station Controls shall be measured on a lump sum basis and shall include all panels, wiring, mounting, instrumentation, grounding and all items needed for a complete functioning booster station and also as detailed in the plans.

END OF SECTION

SECTION 02910  
HYDROPNEUMATIC TANK

PART 1 - GENERAL

1.01 DESCRIPTION

This work shall consist of furnishing and installing a complete factory built above ground horizontal pressure tank for the purpose of functioning as a hydropneumatic tank. The tank shall be complete with all necessary equipment and shall be installed on a reinforced concrete pedestal foundation.

PART 2 - MATERIALS

2.01 TANK

A 4000 gallon NSF-61 approved steel pressure tank rated at 120 psi or higher maximum pressure. The tank shall be 0.250 welded steel conforming to SA-36/516-70 with epoxy lined interior. It shall comply with current "AWWA Standard for Welded Carbon Steel Tanks for Water Storage" and to the ASME Code for Unfired Pressure Vessels and shall have two saddles welded to its body to support the tank on concrete foundations. There shall be sufficient lifting lugs to allow safe and convenient placement on the foundation.

2.02 TANK COATING

Interior Tank Coating shall be epoxy lined. All paints, primers and sealers on the interior of the water tanks shall be NSF approved for contact with potable water. Coal tar, wax, or bitumastic shall not be used in interior coatings of water tanks.

The tank shall be sandblasted at its manufacturing site to a bright metal appearance per SSPC-SP6 and shall include the removal of all rust, mill scale and other foreign materials. Painting operation shall take place at the site of manufacture immediately after surface preparation. Paint shall be a two-part high solids self-priming epoxy suitable for marine applications. A minimum of two-coats shall be applied for a final 6-12mil dry thickness. Color shall match the booster station equipment. The exterior of the tank shall have two (2) coats of epoxy primer followed by one (1) coat of acrylic polyurethane.

The tank shall receive touch up painting after installation to cover all damage to the original coating including scuffs and scrape marks as well as obvious damage. Touch up coating shall be done with the same paint as the original coating.

2.03 TANK FOUNDATION

The tank shall be installed by the contractor on two reinforced concrete foundations constructed as indicated on the project plans. Prior to installing subbase, contractor shall provide written documentation that the subgrade material has been approved by an independent testing lab and the Engineer of Record as being non-yielding or pumping and also that it is free of all excessive clay, silt, roots or organic material.

The Contractor shall provide engineer with one (1) passing density on the subbase and one (1) passing density on the base per footer, prior to concrete construction.

2.04 TANK ACCESSORIES

The tank shall be equipped with the following accessories:

- A. Sight glass to allow a visual indication of the water level. Valves shall be provided to allow drainage and repair of the sight glass.

- B. Pressure relief valve, set to discharge if the pressure in the tank exceeds normal working pressure. The pressure relief valve shall meet ASME Code requirements.
- C. Drain with a resilient seat valve and horizontal discharge shall be provided on the bottom of the tank, sized to allow drainage of the tank in a reasonable time.
- D. Access to the tank shall be provided on the bottom 1/3 diameter of the tank so that the gasket will remain submerged, sized at least 18 inches in the smallest dimension.
- E. A weather proof pressure gauge should be mounted above the maximum water level, with an isolation valve.
- F. Valved connections for air volume and pressure controls.
- G. Air compressor to replenish the air being absorbed.

## 2.05 CONTROLS

Air volume and pump controls shall maintain the water level between 1/3 and 1/2 diameter measured from the bottom of the tank. Controls shall be designed to minimize release of air through the air release valve and maximize pump run time. The controls must sense both air pressure and the water level to maintain proper conditions for providing desired pump cycle.

## PART 3 - CONSTRUCTION REQUIREMENTS

### 3.01 STARTUP

Tank operation shall be demonstrated by the Contractor's qualified representative who shall demonstrate performance and maintenance for the Owner's operators. O&M manuals shall be supplied. These manuals shall describe maintenance requirements, replaceable parts, and other items required for proper tank operation.

### 3.02 PIPING

The booster pumps shall be connected to the water system using piping that complies with water distribution system specifications and as shown on the project plans.

## PART 4 - MEASUREMENT AND PAYMENT

### 4.01 HYDROPNEUMATIC TANK FOUNDATION

Hydropneumatic tank foundation shall be measured on a "lump sum" basis and shall include reinforced concrete foundation, crushed limestone base for concrete foundation, removal of unsuitable material, replacement of unsuitable material with select granular material, reinforcement steel, material testing, and all labor, equipment and materials required for a complete and fully functional final product.

### 4.02 4,000 GALLON HYDROPNEUMATIC TANK AND CONTROLS

Hydropneumatic tank shall be measured on a "lump sum" basis and shall include tank, support saddles, valves, piping, tubing, air compressor, wiring, controls, control panel, mounting, bracing and all other accessories required for fully functioning hydropneumatics tank, placing the tank, anchoring the tank and all labor, equipment and materials required for a complete and fully functional final product and also as detailed in the plans.

END OF SECTION

SECTION 02920  
COLLECTOR TANK

PART 1 - GENERAL

1.01 DESCRIPTION

This work shall consist of furnishing and installing a complete factory built above ground vertical non-pressurized tank for the purpose of functioning as a collector tank. The tank shall be complete with all necessary equipment and shall be installed on a reinforced concrete slab.

PART 2 - MATERIALS

2.01 TANK

A 3200 gallon vertical tank shall be 0.250 welded steel conforming to SA-36/516-70 with epoxy lined interior. It shall comply with current "AWWA Standard for Welded Carbon Steel Tanks for Water Storage". There shall be sufficient lifting lugs to allow safe and convenient placement on the foundation.

2.02 TANK COATING

Interior Tank Coating shall be epoxy lined. All paints, primers and sealers on the interior of the water tanks shall be NSF approved for contact with potable water. Coal tar, wax, or bitumastic shall not be used in interior coatings of water tanks.

The tank shall be sandblasted at its manufacturing site to a bright metal appearance per SSPC-SP6 and shall include the removal of all rust, mill scale and other foreign materials. Painting operation shall take place at the site of manufacture immediately after surface preparation. Paint shall be a two-part high solids self-priming epoxy suitable for marine applications. A minimum of two-coats shall be applied for a final 6-12mil dry thickness. Color shall match the booster station equipment. The exterior of the tank shall have two (2) coats of epoxy primer followed by one (1) coat of acrylic polyurethane.

The tank shall receive touch up painting after installation to cover all damage to the original coating including scuffs and scrape marks as well as obvious damage. Touch up coating shall be done with the same paint as the original coating.

2.03 TANK FOUNDATION

The tank shall be installed by the contractor on a reinforced concrete slab constructed as indicated on the project plans. Prior to installing subbase, contractor shall provide written documentation that the subgrade material has been approved by an independent testing lab and the Engineer of Record as being non-yielding or pumping and also that it is free of all excessive clay, silt, roots or organic material.

The Contractor shall provide engineer with one (1) passing density on the subbase and one (1) passing density on the base, prior to concrete construction.

2.04 TANK ACCESSORIES

The tank shall be equipped with the following accessories:

- A. Water level gauge with valves to allow for drainage and repair of the gauge.
- B. Screened vent as large as the inlet/outlet pipe in accordance with current AWWA standards, to protect tank from entrance of insects, birds and other contaminants.
- C. Overflow in accordance with current AWWA standards.

- D. Two (2) inch tank drain.
- E. Tank access according to current AWWA standards. The opening shall have a curb at least four (4) inches high and the cover shall have a downward overlap of at least two (2) inches.
- F. Three (3) inch float valve.

### PART 3 - CONSTRUCTION REQUIREMENTS

#### 3.01 PIPING

The booster pumps shall be connected to the water system using piping that complies with water distribution system specifications and as shown on the project plans.

### PART 4 - MEASUREMENT AND PAYMENT

#### 4.01 COLLECTOR TANK FOUNDATION

Collector tank foundation shall be measured on a "lump sum" basis and shall include reinforced concrete foundation, crushed limestone base for concrete foundation, removal of unsuitable material, replacement of unsuitable material with select granular material, and all labor, equipment and materials required for a complete and fully functional final product.

#### 4.02 3,200 GALLON COLLECTOR TANK

Collector tank shall be measured on a "lump sum" basis and shall include tank, valves, piping, all other required accessories, placing the tank, anchoring the tank and all labor, equipment and materials required for a complete and fully functional final product.

#### 4.03 COLLECTOR TANK CONTROLS

No measurement for separate payment for Collector Tank Controls or electrical connections will be made. All work and equipment for a completed work shall be paid for in the line item "Booster Station Controls".

END OF SECTION

SECTION 13200  
PROJECT SIGN

PART 1 GENERAL

1.01 SCOPE

The work covered by this specification shall consist of furnishing, constructing, and installing the project signs in accordance with the details shown on the plans and/or set out in this specification.

1.02 SUBMITTAL

The Contractor shall submit a color proof drawing to the Engineer for approval.

1.03 REFERENCE DRAWING

The project sign shall be prepared as shown in the project sign drawing which has been included in Section C – USDA RUS Documents.

PART 2 PRODUCTS

2.01 SIGN POST

Sign posts shall be 4" x 4" Southern Yellow Pine, rough sawn, accurately sized, No. 2 or better as per SPIB, sized as shown on the plans and/or set out in this specification. Post shall be pressure treated as required to retain 0.5 pounds of Chromated Copper Arsenate per cubic foot, unless otherwise specified.

2.02 PLYWOOD

Plywood shall meet the requirements of U. S. Product Standard PS 1 and shall be identified with the appropriate grade--trademark of the American Plywood Association. Plywood which is exposed to the weather shall be ¾" thick exterior type. All exposed plywood faces shall be Grade A. Thickness shall be set out on the plans or as designated in this section.

2.03 PAINT

Paint for background, lettering and symbols shall be exterior grade latex paint.

2.04 SIZE

Unless shown otherwise the project sign shall be 4'x8' with the 8' dimension being the width.

PART 3 - CONSTRUCTION REQUIREMENTS

3.01 LETTERING

All lettering shall be neatly arranged on the board and painted in block print. The letters shall be uniformly spaced with uniform height and width. The work shall be performed by a skilled artist craftsman competent in the painting of signs.

The sign shall be painted and lettered as shown on pages SGC-52 through SGC-53 of these specifications. Stenciled letters are not acceptable.

The sign shall have the project title, project number, funding agency, owner and owner's representatives listed as shown on the project sign detail.

3.02 PAINTING

The plywood shall have two coats of exterior grade paint front and back for the background. Symbols shall be one coat if no further coats are required to keep the background from showing through.

3.03 MOUNTING

The sign shall be mounted on two 4" x 4" pressure treated posts which extend from the top of the sign to a bury depth of at least thirty-six inches. The bottom of the sign to the ground shall also be thirty-six inches.

3.04 LOCATION

The sign or signs shall be erected at locations specified by the Engineer.

3.05 INSTALLATION

Earth backfill around the posts shall be thoroughly tamped in layers not greater than four (4) inches and shall completely fill the post hole void space.

The sign panel shall be bolted to the signpost with appropriately sized carriage bolts. The nuts shall be countersunk on the backside of the post. After the nut is tightened, the threads shall be distressed to prevent easy removal of the nut. Bolt holes shall be no more than 1/16" larger than the bolt diameter.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Signs shall be measured on a "per each" basis including sign panel, sign posts, mounting hardware and all other items required for a complete installation.

4.02 PAYMENT

Payment shall be made at the "per each" contract unit price which shall be full compensation for furnishing and constructing a project sign.

**See Section C – USDA RUS Documents  
for Project Sign Drawing**



SECTION 16100  
BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - SCOPE

2.01 DESCRIPTION

This work shall include all labor, materials and equipment required to connect equipment in accordance to applicable codes and ordinances.

PART 2 - PRODUCTS

2.01 GROUNDING

A. Ground Rod

Copper clad steel, 3/4 inch in diameter x 10 feet in length.

B. Mechanical Connectors

Cast bronze construction with matching bolt, nuts, and washers.

C. Exothermic Welds

Materials shall be from a single supplier and shall be Cadweld or approved equal.

D. Conductors

Bare copper complying with applicable sections of these specifications.

2.02 SUPPORTS

A. Fabricated Steel

Galvanized steel of standard shapes and sizes.

B. Manufactured Channel

Hot dipped galvanized with all hardware required for mounting as manufactured by Unistrut, Kindorf, or Powerstrut.

C. Miscellaneous Hardware

All miscellaneous hardware components shall be hot dipped galvanized, aluminum, stainless steel or other corrosion resistant material suitable for outside usage.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install Products in accordance with manufacturer's instructions.

B. Except where specifically indicated otherwise, all exposed non-current-carrying metallic parts and the system neutral of the electrical system shall be grounded as follows.

1. The system grounding shall be made utilizing ground rods driven into the ground. The maximum resistance of the driven ground shall not exceed 25 ohms under normally dry conditions.

2. If this resistance cannot be obtained with a single rod, additional rods shall be installed not less than 6 feet on centers, or if sectional type rods are used, additional sections may be coupled together and driven with the first rod. The resultant resistance shall not exceed 25 ohms measured not less than 48 hours after rainfall.
  3. Install ground rods and conductors on all poles with guy wires, steel cross arms, lightning arrestors, transformers, terminators, etc.
  4. Equipment grounding shall be accomplished by installing a separate grounding conductor in each raceway of the system. The Conductor shall be provided with a distinctive green insulation or marker and shall be sized in accordance with Table 250-95 of the National Electrical Code for circuit ampacity ratings.
- C. Make electrical connections to equipment in accordance with equipment manufacturer's instructions.
- D. Install support systems sized and fastened to accommodate weight of equipment and conduit, including wiring, which they carry.
- E. Identify electrical distribution and control equipment, and loads served, to meet regulatory requirements and as specified herein. Provide labels for Panelboards and Distribution Equipment.
- F. Install wire markers on each conductor in panelboard gutters, boxes, and at load connections.
- G. Excavating, trenching, and backfilling shall be accomplished as indicated on the Drawings or where required to install systems and/or equipment.
1. Trenches for all underground conduits or equipment shall be excavated to the required depths. Where soft, wet, or unstable soil is encountered, the bottom of the trench shall be filled with 6 inches of compacted gravel and sand fill. All trench bottoms shall be tamped hard. Trenches shall be shored as required to meet OSHA requirements and general safe working conditions.
  2. After conduits or equipment have been inspected and approved by the contracting officer and prior to backfilling, all forms shall be removed and the excavation shall be cleaned of all trash and debris. Material for backfilling shall consist of the excavation, or borrow of sand, gravel, or other materials approved by the Contracting Officer and shall be free of trash, lumber, or other debris. Backfill shall be placed in horizontal layers, not exceeding 9 inches in depth and properly moistened to approximate optimum requirements. Each layer shall be compacted by hand or machine tamped to a density equivalent to surrounding soil.
- H. Cleaning and Painting: The Contractor shall clear away all debris, surplus materials, etc., resulting from their work or operations, leaving the job and equipment furnished in the clean, safe condition.
1. All equipment shall be thoroughly cleaned.
  2. The Contractor shall refinish and restore to the original condition and appearance, all electrical equipment, which has sustained damage to manufacturer's prime and finish coats or enamel or paint.

- I. Cutting and Patching: This Contractor shall provide all cutting, digging, etc., incident to his work and shall make all required repairs thereafter to the satisfaction to the contracting officer. Pavements, sidewalks, roads, and curbs shall be cut, patched, repaired and/or replaced as required to permit the installation of the electrical work.

### 3.02 EXISTING ELECTRICAL SYSTEM

- A. The Contractor shall verify that abandoned wiring and equipment serve only abandoned facilities.
- B. Disconnect existing electrical systems indicated for removal.
- C. Coordinate electrical service outages and reconnections with Utility Company and the Owner.
- D. Provide temporary wiring and connections to maintain existing systems in service during construction.
- E. Remove, relocate, and repair existing installations to accommodate the new construction.
  - 1. Remove abandoned wiring to the source of supply.
  - 2. Disconnect and remove abandoned distribution equipment.
  - 3. Disconnect and remove electrical devices and equipment serving equipment that has been removed.
  - 4. Disconnect and remove abandoned luminaries, brackets and other accessories.
- F. Maintain access to existing, active electrical installations.
- G. Salvaged Materials: Materials and equipment removed from the construction site shall remain the property of the Owner. This Contractor shall remove and store materials until directed by the Owner as to disposition. Materials may be salvaged by the Owner or disposed of by the Contractor as directed by the Owner.

## PART 4 - PAYMENT

### 4.01 ALLOWANCE FOR REPLACING POWER LINE WITH THREE PHASE UNDERGROUND CABLE

The bid schedule shall establish an allowance for paying the local electrical company for replacing the existing overhead electrical line with buried three phase cable. The allowance shall also include paying any fees that may be assessed by the local power company for providing true three phase power to the site instead of the existing derived three phase power.

### 4.02 CONTROL AND POWER CABLES

Measurement and payment for this pay item shall be made on a lump sum basis and shall include locating existing water lines and buried cables prior to construction to avoid conflicts. This pay item shall also include installing and connecting underground power cables in compliance with applicable codes. Also included will be coordinating work so that only one well pump is removed from service at a time.

4.03 SUPPORT FRAME AND UNI-STRUT FOR CONTROL PANEL, VFD AND SCADA

There will be no extra payment for uni-strut type mounting frame with concrete footings at the locations designated on the project drawings. This construction will be considered a subsidiary item to the units being mounted.

4.04 BOOSTER PUMP ELECTRICAL POWER AND SITE LIGHTING

This lump sum pay item shall include coordination with the local electrical power company to provide overhead electrical power to the site and site lighting as shown on the project plans. This pay item shall also include running electrical power through the booster pump site as required for all the electrical equipment. Power shall be run underground on the booster pump site unless shown otherwise on the project plans.

END OF SECTION

FOR VIEWING ONLY  
NOT FOR BIDDING PURPOSES

SECTION 16110  
WATER WELL PUMP CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

This work shall consist of all labor, materials and equipment required for furnishing and installing a digital pump control panel having the capability of lead/lag pump activation. It shall also have pump alternation, a graphical display showing tank water level and shall allow convenient setting of pump control points. This item shall be for control only and will require a separate panel for the electrical components required to start and run the pumps.

1.02 SPECIFIED ELSEWHERE

Section 16130 - Variable Frequency Drives

PART 2 – MATERIALS

2.01 ENCLOSURE

The NEMA 4 enclosure shall be equipped with a window in the outer door to view the display and lights, an inner door for mounting of display, switches, and lights, and a tamper resistant latch.

2.02 ELECTRICAL REQUIREMENTS

The controller system shall be powered from a 120 Volt, 60 Hertz, single phase power supply. All components and wiring to be clearly labeled to indicate function. All components shall be listed by the Underwriters Laboratories (UL) and construction shall be in accordance with UL and all applicable electrical codes.

2.03 REQUIRED FEATURES

The pump controller shall include the following as standard features:

- Control Breaker: The main disconnect switch shall be 15 Amp single pole breaker rated for 10 kA at 120/240V.
- Fuse: The fuse shall be a 5 Amp, Type CC fuse.
- Lightning Arrester: The lightning arrester shall be a single phase, Type 1 surge protection device with a maximum 150V phase to ground and a SCCR rating of 25 kA RMS.
- "Hand-Off-Auto" Selector Switches: Allows manual or automatic operation of the pump motors. The selector switches shall be a heavy duty, oil tight, NEMA 4 rated switch.
- Indicating Lights: Indicates energization of circuit. Lights shall be heavy duty, oil tight, NEMA 4 rated and shall have an LED lamp with 100,000 hour life. Pump Run lights shall be green in color, and Alarm lights shall be red in color.
- Relay: The relay shall be a 120V, DPDT, plug in relay rated for 10 amps at 120V.
- OCS as Level Control: The Operator Control Station (OCS) shall be a 4.3" color touchscreen display with integral PLC programming. It shall have the capacity to

monitor and maintain liquid levels as well as output alarms. The level control shall be accurate to within 0.1 foot. It shall also provide high and low level alarm outputs for indicating lights and common alarm relay output for horn or light.

- OCS as Cycle Counter and Elapsed Time Meter: The OCS shall display the number of starts and elapsed run time of the pump motor.
- OCS Inputs/Outputs: The OCS shall include 12 digital inputs, 12 digital outputs, 4 analog inputs, 2 analog outputs, Micro SD memory card, Ethernet communication, USB port, RS232 port, and RS485 port.
- Output Relays: The output relays shall be 3 pole, industrial relays rated for 10 amps at 120/240V.
- Alarm Silence Push Button: The alarm silence push button shall be a heavy duty, oil tight, NEMA 4 rated switch.

#### 2.04 PRESSURE TRANSMITTER

The pressure transmitter shall be located on the sensing line connected near the base or on the riser of the elevated tank. The pressure transmitter shall have a pressure range of 0-100psi/230ft and shall generate a 4-20 ma signal. A shielded cable shall be furnished and installed from the pressure transmitter to the pump controller panel.

#### 2.05 SYSTEM LOGIC AND FUNCTION

The pump controller shall operate as follows:

- The pump controller panel shall start and stop a lead pump and a lag pump, with alternation, based on water level in an elevated tank as provided by a pressure transmitter.
- The lead pump shall be started at the pump activation level set point and continue to run until the tank liquid level increases to the pump stop level set point as programmed in the OCS level control meter.
- The lag pump will start after the lead pump starts if the liquid level continues to drop below the pump activation level set point and both pumps will continue to run until the liquid level increases to the pump stop level set point as sensed by the pressure transmitter.
- If the liquid level rises to the high level alarm set point, a high level alarm will be annunciated.
- A low level alarm will be annunciated should the liquid level drop below the low level alarm set point.
- All start/stop level and alarm set points and timer delays shall be operator selected and field adjustable.
- Several pump operating scenarios (Pump 1 then Pump 2, Pump 2 then Pump 1, Alternating) shall also be an available control option.
- The OCS shall also display the tank level, number of starts for each pump, run time in hours for each pump, and low and high level alarm condition.
- The OCS shall have an energized output contact for each pump when that pump is called for.

- A run contact is to be provided from each pump starter to indicate a positive run for each pump.
- The OCS shall log all alarms with the time, date, and type of fault and record this data to an easily removable Micro SD memory card.
- The OCS shall be SCADA and telemetry ready.
- Programming shall be available to provide remote monitoring of the pumping system.
- No hardware modifications shall be necessary for remote monitoring.

#### 2.06 STARTER PANEL

The starter panel shall include motor starters, breakers, contacts, disconnect switch and any other electrical components required to receive a control signal from the pump control panel, start the pumps, and return a signal to the control panel that the pump has started. All components shall be housed in a properly sized NEMA 4 stainless steel enclosure.

### PART 3 – CONSTRUCTION REQUIREMENTS

#### 3.01 MOUNTING

The water well pump controller panel shall be mounted as shown on the project drawings. The electronic components required to start and operate the pumps shall be contained in a separate panel mounted as shown in the project drawings.

#### 3.02 CABLES AND WIRING

All required cables and wiring located above ground shall be installed in conduit. Cables and wiring installed below ground shall be either in conduit or adequately protected direct bury cable. All cable and wiring installation shall comply with all applicable codes, ordinances and panel manufacturer's recommendations.

#### 3.03 OPERATION

One well pump must remain in service at all times and shall be fully functional. Newly installed controls shall be thoroughly tested and shall operate successfully for at least 24 hours before the second well pump is disconnected from service.

### PART 4 – MEASUREMENT AND PAYMENT

#### 4.01 WELL PUMP CONTROL PANEL WITH NEMA 4 ENCLOSURE

This pay item shall be measured on a "per each" basis and shall include NEMA 4 stainless steel enclosure, control panel, modification of existing breaker panel, modification to existing wiring, along with all labor, equipment and materials required for a complete and fully functional final product.

Variable Frequency Drives (VFD), pressure transmitter assembly, control cables and underground power cable shall not be included but shall be a separate pay item.

#### 4.02 STARTER PANEL

This pay item shall be measured on a "per each" basis and shall include NEMA 4 stainless steel enclosure, disconnect switch, motor starters, contacts and all other

components required to operate the pumps.

#### 4.03 PRESSURE TRANSMITTER ASSEMBLY

Pressure transmitter assemblies shall be measured on a “per each” basis and shall include a stainless steel service tap, brass corporation stop, pressure sensor, quartzite box, fittings, pipe and all labor, equipment and materials required for the assembly shown on the project plans. The data cable from the pressure transmitter to the control panel or SCADA system shall not be included in this pay item but shall be part of the lump sum item for control and power cables.

#### 4.04 UNI-STRUT SUPPORT FRAME

There will be no extra payment for uni-strut support frame. This construction will be considered a subsidiary item to the unit being mounted.

END OF SECTION

FOR VIEWING ONLY  
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SECTION 16120  
SCADA SYSTEMS

PART 1 - GENERAL

1.01 This work shall consist of all labor, materials, and equipment required to construct supervisory control and data acquisition (SCADA) systems for water well pumps as indicated in the plans and as specified and authorized herein.

1.02 MANUFACTURER'S REQUIREMENTS

A. Manufacturing Experience

Manufacturers of SCADA equipment shall have produced and widely marketed such systems for at least 10 years. Only manufacturers who agree to adhere to warranty and all other requirements of these Specifications shall be acceptable.

B. Monitoring Experience

The SCADA manufacturer shall have been in business providing remote facility monitoring services to the water well pump industry or a substantially similar industry for at least 10 years.

C. Staff Experience

The SCADA manufacturer shall have, on staff, engineering and operational personnel with at least 20 years of combined experience in designing, manufacturing and operating wide area wireless telemetry systems, microprocessor based monitoring systems and interactive remotely accessible monitoring systems (Internet or Otherwise), database management systems and computer telephony.

D. Equipment Source

All SCADA equipment shall be furnished by a single supplier who shall be an authorized representative of the SCADA manufacturer. The SCADA supplier shall be accountable for the design and performance of the system. The SCADA supplier shall have at least one qualified technician trained to service and repair the equipment supplied on this project. This service technician shall be based at an office of the supplier located no more than 100 miles from the project site.

E. Monitoring Services

Monitoring services, if required, shall be provided by the SCADA manufacturer or by a duly authorized and trained agent of the manufacturing company or a combination of both.

F. Technical Support

The SCADA manufacturer or their suitably trained, authorized agent shall provide technical support 24 hours a day seven days a week including

holidays. Technical support may be provided by a national agent by telephone or email.

G. References

The SCADA manufacturer shall provide references of at least 5 other water system operators who are using substantially similar systems as is being proposed. Those systems shall be within a 300 mile radius of the project location. References may include both water and waste-water systems.

H. Field Equipment

The submitting company shall be able to provide field equipment that transmits alarm conditions and daily status events.

I. Documentation Submittal

The submitting company shall provide documentation that warrants compliance with all above listed requirements. Documentation shall be submitted at day of the project bid.

### 1.03 SITE EXAMINATION

Prior to submitting a bid, all Bidders shall carefully examine the sites of the proposed work. It is mutually agreed that the submission of a bid shall be prima facie evidence that the bidder has made such examination and has judged for and satisfied himself as to the conditions to be encountered regarding the character, quality, and quantities of work to be performed and materials to be furnished. Bidders shall also familiarize themselves with and shall comply with the requirements of all federal, State and local laws and ordinances which may directly or indirectly affect the equipment or its prosecution, persons engaged in or employed on the Work, and materials or equipment used in the Work. No adjustments or compensations will be allowed for losses caused by failure to comply with the foregoing requirements of this entire paragraph.

### 1.04 BID DOCUMENTATION

The following additional information shall be provided on Company letterhead of the supplier or authorized representative:

1. Equipment Manufacturer, address, telephone number
2. Make and model number of the proposed SCADA equipment
3. Authorized representative (if any), address, telephone number
4. Statement that the submitted price includes all conditions and requirements of the project specifications.
5. Statement that the units will be sold individually for a fair market value to any customer supporting the Owner. The price shall include all costs associated with these Specifications including but not limited to equipment, shop drawings, travel expenses, storage, and delivery.
6. Schedule that will detail, in calendar days, the required time from the Issue of

purchase order to delivery of Shop Drawings in accordance with these Specifications.

7. The required time, specified in calendar days, from the approval of the submittals to the delivery of the equipment.

#### 1.05 SUBMITTALS

Within four (4) calendar weeks of the issuing of the purchase order, the contractor shall submit to the Engineer for review and approval (5) copies of all Shop Drawing Submittals, which will bear a stamp of specific written indication that the referenced equipment meets all requirements of the project specifications.

All submittals will be identified with project site name. The data shown on the Shop Drawing Submittals will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable Engineer to review the information.

Before submission of each shop drawing, the manufacturer shall determine and verify all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and reviewed or coordinated each Shop Drawing with other Shop Drawings and the requirements of the specifications and the contract documents.

The Shop Drawings shall contain the following information:

- A. Complete description in sufficient detail to permit an item comparison with the specifications.
- B. Dimensions and installation procedures unique to each project site.
- C. Descriptive information including catalog cuts and manufacturers' specifications for all components.
- D. Electrical schematics and layouts.

At the time of each submittal, the contractor shall give the Engineer specific written notice of each variation that the Shop Drawings may have from the requirements of the Contract documents, and, in addition, shall cause a specific notation to be made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

The Engineer will review with reasonable promptness, Shop Drawings, but Engineer's review will be only for conformance with the design concept of the project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, techniques, sequences or procedures of construction (except where a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents) or to safety precautions or programs incident thereto.

The review of a separate item as such will not indicate approval of the assembly in which the item functions. The Contractor shall arrange for the manufacturer shall make corrections required by the Engineer and shall return the required number of corrected copies of shop drawings and submit as required new samples for review. The manufacturer shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

The Engineer's review of shop drawings or samples shall not relieve the manufacturer from responsibility for any variation from the requirements of the Contract Documents unless the manufacturer has, in writing, called Engineer's attention to each such variation at the time of submission and Engineer has given written approval of each such variation by a specific written notation thereof incorporated in or accompanying the shop drawing or sample approval; nor will any approval by Engineer relieve the manufacturer from the responsibility for errors or omissions in the shop drawings or from responsibility for having complied with the provisions of the previous paragraphs.

The Contractor shall not purchase any equipment or deliver any equipment to the project site without an approved shop drawing. Where a shop drawing is required by the Specifications, any related work performed prior to the Engineer's review of the pertinent submission will be the sole expense and responsibility of the Contractor.

#### 1.06 O&M MANUALS

After installation of the completed system, a minimum of three (3) operational and maintenance (O&M) manuals shall be provided. The Owners shall have time prior to project completion to review the O&M manuals and have any comments or requests incorporated into the final three (3) copies.

#### 1.07 "OR EQUAL" CLAUSE

Whenever a material or article required is specified or shown on the plans by using the name of any proprietary product or of a particular manufacturer or vendor, any material or article which will meet the design criteria and is equal in function and durability, as determined by the Engineer.

#### 1.08 PROTECTION OF COMPLETED WORK

Until final acceptance the Equipment shall be in the custody and under the charge and care of the Contractor who shall take every necessary precaution against injury or damage to any part thereof by the action of the elements or from any other cause, whether arising from the execution or from the non-execution of the work. The Contractor shall rebuild, repair, restore, replace and make good at his own expense, all injuries or damages to any portion of the equipment occasioned by any of the above causes before its completion and acceptance and shall bear the expenses thereof.

## 1.09 FINAL ACCEPTANCE

Final acceptance of the equipment shall be after equipment start up when all items of work have been documented to be complete and in good working order.

## 1.10 MONITORING REQUIREMENTS

The following items shall be monitored with the resulting data transmitted and recorded by the SCADA system.

- Elevated tank water level from pressure transmitter
- Well pump status (On/Off)
- Well pump totalized run time
- Well pump three phase voltage for each leg
- Well pump power loss
- VFD speed setting
- Chlorine pump status (On/Off)
- Chlorine pump totalized run time
- Master meter real time flow
- Master meter totalized flow
- Emergency generator status (On/Off)
- Emergency generator totalized run time

The following alarm conditions will be monitored and reported when alarm condition exists. The master SCADA unit shall call and email designated personnel when user selected alarm conditions occur. The critical alarms shall be selected by the Owner from the list below. All alarms listed below shall be capable of being designated as critical.

- Power loss
- Elevated tank level - Overflow level
- Elevated tank level - Empty
- Chlorine pump run time below user designated minutes per day
- Emergency generator below user designated minutes per week
- A single general alarm condition that indicates one of the many VFD faults and alarms has occurred. It is not necessary to identify the VFD alarm but may be reported as a general VFD alarm.

## PART 2 - MATERIALS

### 2.01 SCADA Field Equipment

#### A. Enclosures

All field hardware shall come enclosed in a fiberglass or stainless steel NEMA 4 or NEMA 4X enclosure capable of housing all electronics and backup batteries.

B. Standardized Parts

The field equipment installed at each site shall be identical and swappable with field equipment at other sites so as to allow the Owner to swap equipment at any site.

C. Digital Inputs

The field hardware shall have at least 8 digital (dry contact) inputs.

D. Reporting

The field unit shall be capable of reporting for each input alarm, return to normal and fault condition.

E. Transmitting Unit

The field unit shall be made available cellular communication technology which transmits alarms, totalized data and near real time data.

F. Analog Inputs

The field unit shall have at least 2 analog inputs (0-5 Vdc or 4-20 ma) of at least 10 bit resolution. Each analog input shall have at least 2 threshold alarm set points. Independent high and low set points shall be provided for each analog input. The Remote Terminal Unit (RTU) shall transmit both alarms and returns to the normal.

G. Trip Inputs

The field hardware trip inputs must operate normally when either side of the trip inputs circuitry is shorted to ground and send a trouble signal upon detection of such short to ground.

At least 3 of the field hardware trip inputs must be capable of being programmed to record and report pump run times as indicated by a relay opening and closing for up to three pumps.

H. Pump Starts

The field unit shall record and report individual pump starts on a one hour, one day or seven day basis. The unit shall have the ability to report within one hour any individual pump starting in excess of a preprogrammed amount. The excess pump start messages shall be automatically forwarded to the Owner's users via autodialer and email.

I. Shutdown

The field unit shall have a means of being put in local shutdown without powering the unit down. The act of the local shutdown shall be recorded, along with the name or identity of the person performing the local shut down at the central computer facility.

The field hardware shall be capable or reporting pump running status and

analog level status in less than 10 seconds from occurrence or on at least a two minute basis. The field hardware shall transmit and receive data via a master SCADA station which shall be supplied to the Owner as a part of this project. All data shall be accessible via SSL secure web based screens.

J. Power Supply Monitoring

The field hardware shall monitor its primary AC power supply input and shall be capable of sending an AC failure alarm.

K. Battery Backup

The field hardware shall have a built in supervised battery backup power supply capable of providing a minimum of 24 hours nominal backup time. The unit shall detect and report and backup battery power supply test failure.

L. Remote Terminal Unit (RTU) Configuration

The basic RTU configuration items shall be performable via local switch settings on the RTU, via the Serial Port on the RTU, Or remotely via the master SCADA unit.

M. Silencing Alarms

The field unit shall have the capability of being shut down from transmitting any alarms by use of a push button switch or login password. Unit shut down shall be logged at the central computer. The field unit shall be capable of re-enabling itself for alarm use by a central computer. The field unit shall be capable of re-enabling itself for alarm use by a subsequent electronic key card use or subsequent push button activation or by login and password. Such re-enabling shall be transmitted to the central computer for logging.

N. Transmission Monitoring

The field hardware shall utilize a transmission scheme that detects and subsequently reports individual transmission failures.

O. Encryption

The field hardware shall utilize, in the case of continuously transmitting field unit, a transmission scheme that encrypts the transmitted data utilizing a 128 bit encryption or better.

P. Signal Outage Report

The field hardware test transmissions shall report any communication signal outages.

Q. Reporting

The field hardware must be capable of reporting, on demand or on schedule, operational status accumulated pulse input valves, pump run time duration's and current operational status of normal alarm trip inputs (trouble, alarm, normal states).

- R. Shock Hazard  
The field unit shall not present an electric shock hazard.
- S. UL Compliance  
The field unit shall be capable of being listed as complying with Underwriter's Laboratory requirements for remote signaling devices.
- T. Central Monitoring  
The system shall have a primary central monitoring and control center or website.
- U. Data Service Type  
It is the intent of these specifications that SCADA alarm units be capable of utilizing GSM/GPRS or CDMA 1xRTT cellular data services. Devices utilizing AMPs analog data services or SMS (short message services) shall not be accepted. The Owner shall not be responsible for any cost beyond those included in this Contract to upgrade their system. A statement to this fact provided on company letterhead signed by an authorized representative of the equipment manufacturer shall be included with the proposal.

## 2.02 MONITORING CONTROL CENTER

- A. Monitoring Center  
The master SCADA system shall allow the Owner to monitor and store all data. All SCADA shall be the sole property of the Owner.
- B. Encryption  
SCADA data shall be protected over the internet. All web pages shall be secured with 128-bit encryption. Access to the website shall be secured by individual user logon names and passwords.
- C. Software Cost  
All SCADA software shall be provided as a part of this project including all costs for a period of 2 years from the date of acceptance.
- D. Power Supply  
The SCADA supplier shall provide an uninterruptible power source capable of stand alone operation for at least 4 hours.
- E. Remote Control  
The SCADA system shall be constructed for monitoring only and shall not control any equipment.
- F. Tabulated Daily Reports  
The customer operated central monitoring software shall provide an easy to understand tabulation of daily operating reports for all remote points being



monitored by the system. The system shall be able to indicate by color on a general overview the following conditions: alarm, normal status, off-line, and disarmed unit.

G. Graphical Reports

The customer operated central monitoring software shall provide screens that can display daily historical data trends in a graphic format.

H. Field Hardware Control

The customer operated central monitoring software shall provide the remote command and control of the customers monitored field hardware in a manner consistent with the field unit's capabilities.

I. Alarm Delivery Options

The customer operated central monitoring software shall provide functions for the customer to add/delete/change a field unit's alarm notification delivery methodologies and destinations.

J. Customer Access Interface

The customer operated central monitoring software shall provide easy to understand and use screens for the customer to securely access, globally or individually, alarms, testing, and notification results for the customers field monitoring units.

K. Remote Enabling/Disabling Capability

The customer operated central monitoring software shall provide a methodology to enable/disable an entire unit from reporting, or any of the units individual inputs from reporting with such enabling/disabling to be time scheduled by the customer or enabled/disabled by the push button switch.

L. Alarm Tracking

The customer operated central monitoring software must have a methodology to track the results of all alarm notifications.

M. Daily Pump Run Time

The equivalent customer operated central monitoring software must have the ability to analyze and display, graphically or tabular, all pump run times on a daily basis.

## 2.03 REPORTING

A. Daily Data Report

The customer operated central monitoring software shall automatically download on a daily basis graphically or tabular: pump run times, pump parts, flow rate, analog high/low, and snapshot.

B. Unit Check-in

The customer operated central monitoring software shall have daily unit check-in and end-to-end acknowledgement of all data and alarms.

C. Alarm Transmittal

The customer operated central monitoring software shall be equipped with adequate communications links to provide reasonable assurance that alarms will be delivered via any chosen delivery methodology to selected recipients within 30 seconds of the monitoring center receiving such alarms from field equipment.

The customer operated central monitoring software shall be capable of automatically delivering alarm or other selected messages to email addresses, facsimile machines or voice telephones (hardwired or wireless, local or long distance). All message notification attempts, failures and delivery/acceptance confirmations will be logged.

The customer operated central monitoring software shall be capable of scheduling alarm notifications to recipients by time of day, day of week, holiday and input type.

D. Alarm Suppression

The customer operated central monitoring software must have the ability to suppress erroneous digital alarms that occur in conjunction with AC power failures.

The customer operated central monitoring software must have the ability to selectively suppress, repeat or duplicate alarms from a particular field unit and a particular input.

E. Follow-up Alarm

The customer operated central monitoring software must have the ability to selectively, by digital or analog input, cause a second alarm call out to be performed by the system if the original alarm point is still in alarm, even though acknowledged, after a prescribed period of time.

F. Group Alarm Notification

The customer operated central monitoring software shall be capable of buffering AC Power failure messages for a customer defined amount of time and then issuing a single group alarm notification messages that embody a list of all the monitored sites that have AC power failure. The same group alarm notification function shall apply to monitored sites that have AC power restoring to normal.

G. Alarm Record

The customer operated central monitoring software shall store all system

messaging transactions, operator commands, notification attempts and message delivery confirmations in a secure, non-alterable database.

H. Link Loss Alarm

The customer operated central monitoring software shall automatically report and notify customer designated recipients of RTU telemetry link loss within five minute of link loss of continuous telemetry RTUs or twenty five hours of link loss for daily reporting RTUs.

I. Weekly Alarms

The customer operated central monitoring software shall provide the customer with automatically generated, weekly reports of all alarms, notifications, delivery confirmations/acceptances and test failures. Such weekly reports shall be made available electronically via web page.

J. Historical Reports

The customer operated central monitoring software shall be capable of generating historical reports of any/all field monitoring unit's alarms, notifications delivery confirmations/acceptances and test failures.

K. Archiving

The customer operated central monitoring software shall be capable of automatically archive all logged system activity on a daily basis to a physically separate database and computer.

L. CSV Output

The customer operated central monitoring software must have the ability to transfer alarm; analog values, pulse count values and pump run time values to other computers via a coma delineated text string file (CSV file) transfer so as the data can be imported into other generally accepted spread sheet computer programs.

2.04 PATENTS

The Manufacturer shall warrant and guarantee that the operating process and goods delivered under this Contract will not infringe any valid patent, industrial design, copyright or trademark, foreign or domestic, owned or controlled by any other corporation, firm or person. The Manufacturer will indemnify and hold harmless the Owner against any and all liabilities, losses, damages, claims and expenses by reason of any claim, action or litigation out of the use by the Owner of any goods supplied by the Manufacturer under this Contract.

PART 3 - EXECUTION

3.01 Installation

The Contractor shall furnish and install a self contained SCADA field unit adjacent to the existing control panel. The SCADA unit shall be mounted on the

supports for the existing control panel if such supports have sufficient space for the new equipment and if the supports are strong enough to bear the additional weight during hurricane force winds. If the existing supports can not be utilized then new Uni-strut or equal supports shall be anchored with concrete footings for use in mounting the SCADA equipment. New mountings shall meet all applicable codes and shall be strong enough to withstand hurricane force winds.

### 3.02 Connection

The SCADA equipment shall be properly connected to the existing power source and shall be tied in to the existing control panel's circuitry so that all specified monitoring and control functions are fully operational. Connection of the SCADA equipment shall be performed in accordance with all applicable codes. All work shall be performed by personnel with the proper certifications, training and experience.

### 3.03 Testing

The Contractor shall arrange for the equipment supplier to thoroughly test all equipment in the presence of the Engineer. The equipment supplier shall demonstrate that each feature of the equipment is working properly.

### 3.04 Training

The Contractor shall arrange for the equipment supplier to provide operator training at the project site. Training shall be a minimum of one (1) eight-hour day for on-site and classroom operator training.

The operator training shall be scheduled at the convenience of the Owner and Engineer. If the Owner's representatives fail to attend the training session or cancel with less than 24 hours notice, then the equipment supplier shall schedule a second training session and shall be paid an additional amount for reasonable labor and travel expenses.

### 3.05 Final Acceptance

Upon Substantial Completion the Contractor shall notify the manufacturer that the SCADA equipment has been accepted, subject to the two-year guarantee, as required in these specifications.

Subsequent to the final acceptance of this project, the Contractor shall furnish a written guarantee from the manufacturer covering all defects in material and workmanship for a period of two (2) years commencing on the date of substantial completion. The Contractor shall also submit O&M manuals, operator training and start-up by a certified technician.

## PART 4 – MEASUREMENT AND PAYMENT

### 4.01 RTU, SENSORS, DIGITAL ENCODERS AND WIRING

Remote telemetry units (RTU) shall be measured on a per each basis and shall

include the RTU, sensors, digital encoders, wiring, conduit for above ground wiring and all labor, materials and equipment required for a completed working unit which will monitor the equipment designated in the project plans and in these specifications.

#### 4.02 MASTER STATION WITH COMPUTER AND SOFTWARE

The SCADA master monitoring station shall be measured on a lump sum basis and shall include a new computer with SCADA software. This pay item shall also include an internet connection, either wifi or hard wired. Also included will be the prepayment of 2 years of software subscription fees, support fees or any other fees required to provide 2 years of SCADA monitoring. The setup and training related to the master station shall also be included.

#### 4.03 UNI-STRUT SUPPORT FRAME

There will be no extra payment for uni-strut support frame and mounting. This construction will be considered a subsidiary item to the units being mounted.

END OF SECTION

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SECTION 16130  
VARIABLE FREQUENCY DRIVES

PART 1 - GENERAL

1.01 DESCRIPTION

This work shall consist of all labor, materials and equipment required for furnishing and installing variable frequency drives (VFD) for the controlling the speed of water well pumps in accordance with these specifications and/or as detailed in the Drawings. Pump starting, stopping and alternation shall be performed by a separate pump control panel which shall be covered in a separate specification section.

1.02 SPECIFIED ELSEWHERE

Section 16100 – Basic Electrical Materials and Methods  
Section 16110 – Water Well Pump Control

PART 2 – EQUIPMENT

2.01 SCOPE

VFD equipment shall consist of an AC adjustable speed drive along with all electronic components required to start and operate water well pumps. Pump controller controls shall not be included with this item but shall be a separate item housed in a separate panel.

2.02 DESIGN REQUIREMENTS

2.02.1 General

- A. Overall hardware design shall be for maximum flexibility, robustness, serviceability, and reliability.
- B. Power Terminations shall be oversized for the drive current rating to allow for flexibility and ease of connection on all power terminations.
- C. All ratings shall contain a minimum of two ground termination points.
- D. Power Terminations shall be clearly labeled with both the US (NEMA) standards (L1, L2...T2) and IEC standards (R, S...W).
- E. The drive shall employ the latest technology in packaging, heat sink design, and cooling to minimize overall size and weight without degrading performance or functionality.
- F. Standard drive enclosure shall be rated NEMA Type 4 on smaller frame sizes. Larger units shall be IP00 with an optional conduit kit to meet requirements for NEMA Type 4.
- G. The drive shall be capable of mounting with the heat sink external to the cabinet or panel on which the drive is mounted (heat-sink-out-the-back).
  - 1. Mounting shall require an optional flange kit.
  - 2. External heat sink portion of the ASD shall be rated IP55.
  - 3. External mounting shall remove roughly 90% of heat loss from the enclosure.
- H. Power Semiconductor heat sinks contain one or more thermal sensors

monitored by the Microprocessor to prevent semiconductor damage caused by excessive heat or fan loss.

- I. All frame sizes of the drive shall come with an electronics operator interface (EOI) and standard customer terminal strip.
- J. Conformal coating shall be used on the critical areas of the printed circuit boards.

#### 2.02.2 Operating Environment

The drive shall be capable of operating in the following ambient conditions without de-rate:

- A. Ambient temperature: -10 to +50 °C (60° C with de-rate).
- B. Exposed to direct sunlight.
- C. Environment to be free of corrosive and explosive gasses.
- D. Relative humidity: 5 to 95% non-condensing. (IEC 60068-2-3)
- E. Shock: 5.9m/s per s {0.6G} or less (10 to 55 Hz).

The drive shall not suffer any adverse effects from long term storage in the following ambient environmental conditions:

- A. Ambient temperature: -25 to +65 °C
- B. Relative humidity: 5 to 98% non-condensing
- C. Elevation: to 5000 meters

#### 2.02.3 Input Power

- A. The drive main input power shall be rated: Three-phase 200 – 240VAC 50/60Hz
- B. The drive shall have an input voltage tolerance of  $\pm 10\%$  of rated input voltage (-15% with de-rate)
- C. The drive shall have an input frequency tolerance of  $\pm 5\%$  of rated input frequency.
- D. The efficiency of the drive shall be a minimum of 97.0% at full load at full speed.
- E. The drive shall have a displacement power factor greater than 0.95 (lagging) over the entire speed range.

#### 2.02.4 Converter Section (Input)

- A. On smaller frame sizes, the drive employs a full three phase diode bridge rectifier to convert input AC power to DC. This arrangement will make use of a soft charge resistor and contactor to prevent excessive inrush current on the DC bus
  - i. 240V drives: Up to and including 20Hp (HD)
  - ii. 480V drives: Up to and including 25Hp (HD)
- B. On larger frame sizes, a hybrid SCR/Diode front end is used. These units shall be soft charged via control of the SCRs.
  - i. 240V drives: Up to and including 75Hp (HD)
  - ii. 480V drives: Up to and including 450Hp (HD)
- C. The drive input shall be insensitive to input phase sequence.

- D. The drive shall have an input phase loss fault that may be defeated if desired.
- E. Drive shall be capable of operating at reduced capacity in the event of the loss of an input phase.
- F. Semiconductors on all ratings are sized (current) to allow full operation and overload capabilities at minimum input voltage.
- G. PIV Ratings of the rectifier diodes shall be as follows:
  - 1. 240V drives—rectifier minimum PIV rating of 800V
  - 2. 480V drives—rectifier minimum PIV rating of 1600V
- H. An isolation transformer shall not be required for operation on most standard distribution systems.
- I. The converter section is usable on either 50 Hz or 60 Hz distribution systems.

#### 2.02.5 DC Bus Section

- A. Overall DC Bus design is passive capacitive filter or a capacitive and inductive filter to minimize ripple and maximize power-loss ride-through.
- B. The DC bus voltage and current are monitored by the control section to prevent damage to either the drive or the driven equipment.
- C. The DC bus connections shall use tin plated copper bus bar.
- D. The drives shall have the following bus capacitance voltage ratings:
  - 1. 240V drives—400 VDC (minimum)
  - 2. 480V drives—800VDC (minimum)
- E. All capacitors shall have balance/discharge resistors to equalize charge voltage and permit safe discharge on power outage.
- F. Soft-charge circuitry shall not use power transistors or time delay relays.
- G. The DC Bus Section has complete power terminations to allow:
  - 1. Rectifier Isolation (positive side)
  - 2. Line regeneration using third party units
  - 3. DC Link inductor
  - 4. Common DC bussing applications
  - 5. DC input
- H. A readily visible LED shall indicate when DC voltages are present on the bus.
- I. To allow dissipation of regenerated energy, the drive shall feature a built in, microprocessor controlled, dynamic braking transistor on small and medium frame sizes. Larger frame sizes will offer the dynamic braking transistor as an option adder. Refer to the table below for details. The dynamic braking transistor is an IGBT power semiconductor that is sized to allow 100% motor braking torque when connected to an appropriately sized resistor.

Voltage	Included	Option
230V	1/2 HP(HD)-60HP (ND)	60HP(HD)-100HP(ND)
480V	1HP(HD)-125HP(ND), 250HP(HD), 350HP(ND)	125HP (ND)-250HP (ND), 300HP(HD)- 500HP(ND)

- J. The dynamic braking transistor shall be protected from damage due to excessive currents by the microprocessor.



#### 2.02.6 Inverter Section (Output)

- A. The inverter section shall make use of the latest generation of trench non-punch through IGBT power switching transistors to convert DC voltage to a three-phase, variable voltage, variable frequency, and sinusoidal coded PWM waveform.
- B. IGBT initialization testing shall be performed by the control section on each power up.
- C. The inverter section shall not require commutation capacitors.
- D. The drive shall have software and hardware designed to limit reflected wave caused by long motor cable lengths.
- E. The drive IGBT ratings will be as follows:
  - 1. 240V drives – IGBT minimum Vce rating 600V.
  - 2. 480V drives – IGBT minimum Vce rating 1200V.
- F. The drive's output inverter section shall output a Pulse Width Modulated (PWM) square wave. The Drive shall be capable of modulating the pulses of this square wave to control the root mean square voltage and frequency applied to the motor.
- G. The PWM square wave output shall have an adjustable switching frequency (carrier frequency) that may be adjusted to allow the reduction of audible noise and improvement in operations.
- H. All IGBTs shall have reversed biased diodes (free-wheeling) to prevent IGBT failure when subjected to motor discharge spikes.
- I. All inverter section IGBTs must be sized to allow the drive to operate at 100% continuous output current and 150% current for 60 seconds (Heavy Duty), and 120% current for 60 seconds (Normal Duty).
- J. The inverter section shall be capable of sensing and interrupting a phase-to-phase or phase-to-ground fault on the output of the drive.
- K. The output voltage shall be adjustable from 0 to rated input voltage. The output frequency range shall be adjustable for a maximum frequency output of 590 Hz.

#### 2.02.7 Control Section

- A. The control section of the drive shall provide complete operational control of the application while also offering monitoring and protection of the drive itself.
- B. The drive shall attempt to protect itself from damage and fault conditions in any situation regardless of end user programming.
- C. The drive shall employ the latest algorithms to operate a variety of applications in either constant or variable torque modes using the following Volts/Hertz control modes.
  - 1. Constant torque
  - 2. Variable torque
  - 3. Automatic torque boost
  - 4. Energy Savings
  - 5. Dynamic energy savings (for fan and pump)
  - 6. Control for a permanent magnet (PM) motor

7. A user programmable, 5 point V/F pattern
  8. Sensor-less vector control based on current vectors
  9. Sensor-less vector control based on voltage vectors
  10. PG feedback vector control based on current vectors
  11. PG feedback vector control based on voltage vectors.
- D. The drive shall employ two 32 bit microprocessors of the latest industrial design.
    1. The first microprocessor shall be dedicated solely to controlling the output waveform and power performance of the drive.
    2. The second microprocessor shall be used to provide expanded application and control options for the standard drive.
  - E. The microprocessor logic circuits shall be isolated from power circuits.
  - F. Where switching logic power supplies are utilized, they shall be powered from the DC bus section of the drive and not from input AC power.
  - G. Microprocessor diagnostics are performed (on application of power) to prove functionality and viability of the microprocessor.
  - H. Memory cyclic redundancy check (CRC) shall be performed on each application of power to confirm the integrity of EEPROM and UVPROM memories.
  - I. The drive shall be capable of being configured to perform motor diagnostics at operation or when power is applied to prevent damage to the drive due to a grounded or shorted motor. This feature may be disabled when using a low impedance motor.
  - J. Operating system firmware shall be capable of 'flash' upgrading shall enhancements to the operating system firmware become available.
  - K. All drives shall be equipped with four RJ45 ports:
    1. 2-wire RS485 communication connector 1 – Connected beneath the standard drive keypad, this port is the primary connection point for external options.
    2. 2-wire /4-wire RS485 communication port – For customer communication directly to the control section of the drive and drive software
    3. Two Ethernet ports – For Modbus TCP functions and Ethernet/IP functions, including Embedded Web Server

#### 2.02.8 Electronics Operator Interface (EOI)

- A. The Drive shall be supplied with a standard keypad style EOI that may be used for programming, monitoring and operation of the drive
- B. The EOI shall consist of a full-English LCD display along with input buttons and a touch wheel for navigation and control
- C. For security, the EOI functionality and access may be limited and password protected preventing an unauthorized user from accessing parameters, functions, or monitoring.
- D. The drive shall not require the keypad for normal operations when control is via the standard terminal strip or communications.
- E. The EOI Programming section shall provide quick access to the most commonly used drive parameters while allowing access to all programming points in the drive via extended parameters functionality.
- F. The drive EOI shall employ an easy programming mode which can be used to

limit programming options to the most commonly used parameters within the drive for quick setup of the ASD.

- G. The EOI shall allow the user to modify and add parameters to the easy programming list to customize the drive for specific applications.
- H. The EOI monitoring section shall allow real time monitoring of the following details of the drive
  - 1. Direction of rotation
  - 2. Digital and analog input & output terminal status
  - 3. Information on the four most recent faults.
  - 4. Cumulative run timer (resettable)
  - 5. Number of starts
  - 6. Maintenance alarm
  - 7. Output frequency
  - 8. Frequency command
  - 9. Output current
  - 10. Input voltage (DC Detection)
  - 11. Output voltage
  - 12. Compensated frequency
  - 13. Speed feedback
  - 14. Torque
  - 15. Torque command
  - 16. Torque current
  - 17. Exciting current
  - 18. PID feedback value
  - 19. Motor & inverter overload factors
  - 20. Braking resistor load and overload factor
  - 21. Input & Output power
  - 22. Pattern run information
  - 23. Signed data for output frequency, torque and current
- I. The EOI shall store the most recent eight faults in memory.
- J. The Drive EOI shall retain the full monitor information from the drive at the time of each fault.
- K. The EOI shall allow the user to control operation of the ASD (start/stop and frequency set-point).
- L. Optional cable and mounting kit for the Drive shall allow for remote mounting of the keypad on panels or at remote sites.
- M. EOI shall show QR codes accessible via “-i-“ button for drive fault, parameter information, and warranty registration, which will provide immediate access to a dedicated web link for support and maintenance.
- N. EOI shall be capable of multiple languages.
- O. EOI shall utilize a programmable real time clock.
- P. EOI shall have the ability to adjust contrast settings.

- Q. EOI shall have an automatic time out adjustment setting.
- R. By default, EOI shall turn red when drive faults.
- S. EOI shall have trip resolution methods available on the screen when drive faults. T. EOI shall have a "Copy" function for saving parameters to drive or keypad.

#### 2.02.9 Control Terminal Strip (CTS)

- A. The standard control terminals strip (CTS) shall contain all necessary terminals for complete control and monitoring of the drive during typical operation.
- B. The CTS shall make all control wiring on the drive, as well as any optional control devices, accessible via a single access panel.
- C. The CTS shall mount using a single retained screw.
- D. The CTS shall, at a minimum, contain the following terminals:
  - 1. Eight multifunction digital (discrete) inputs independently configurable for any of 84 functions.
    - a. Sink or source logic selectable.
    - b. Normally open/closed operation selectable via software.
    - c. S4/S5 must have PG feedback ability
  - 2. One multifunction, discrete, form C, relay contact output programmable to any of 111 functions.
    - a. Normally open/closed operation selectable via software.
    - b. Contacts rated for 250VAC, 2A or 30VDC, 1A.
  - 3. Two multifunction, discrete, form A, relay contact outputs programmable to any of 111 functions.
    - a. Normally open/closed operation selectable via software.
    - b. Contacts rated for 250VAC, 2A or 30VDC, 1A.
  - 4. One 0-10VDC analog input, internal impedance shall be 31.5k $\Omega$ .
  - 5. One multifunction, 4– 20mA analog input. Internal impedance shall be 250 $\Omega$ .
  - 6. One 0- $\pm$ 10VDC analog input. This terminal shall be capable of bi-directional input commands; internal impedance shall be 31.5k $\Omega$
  - 7. Two 0 – 10Vdc or 4 – 20mA, software selectable analog outputs, programmable to any of 162 functions.
  - 8. One 24VDC power supply output.
  - 9. One 24VDC power input for connecting external control power supply option
  - 10. One 10VDC power supply output.
  - 11. Two Safe-Torque-Off (STO) function inputs that comply with safety standard IEC61800-5-2.
  - 12. One open collector, multifunction digital/pulse train output
    - a. 24VDC-50mA
    - b. Pulse train output up to 30 kpps, 50% duty cycle
- E. Standard CTS shall have the option to add extra terminals using clip-in-place option cards.

## 2.03 FUNCTIONALITY

### 2.03.1 Acceleration and Deceleration

- A. The drive shall contain four sets of independently configurable acceleration/deceleration times.
- B. Each set shall be configurable as to both acceleration and deceleration time and pattern.
- C. Acceleration and deceleration times are adjustable from 0.01 seconds to 6000 seconds D. Available acceleration and deceleration patterns are:
  - 1. Linear
  - 2. S-Curve 1
  - 3. S-Curve 2 (over-speed curve)
- E. The patterns allow for the user to develop and customize application-specific patterns. F. The drive shall have four different acceleration/deceleration times. It shall be possible to switch between these sets via discrete input, electronics operator interface, communications options or on a pre-defined user selectable output frequency.
- G. An automatic acceleration/deceleration selection shall be made available. This function shall automatically adjust the acceleration and deceleration time of the unit for maximum performance.
- H. The drive shall incorporate over-voltage stall and over-current stall settings, in the acceleration and deceleration times, to prevent damage to the driven equipment. Shall acceleration or deceleration settings exceed the ability of the motor to accelerate or decelerate the driven equipment the drive shall automatically adjust the times.

### 2.03.2 Braking

- A. The drive will have, either built in or as an option adder, an IGBT transistor for dynamic braking. The braking transistor shall be controlled by the drive's microprocessor based control system and allows, with the addition of an optional resistor, an economical means of rapidly stopping a high inertia load with up to 100% braking torque.
- B. The braking transistor, braking resistor, and associated circuitry shall be fully protected by adjustable protection parameters.
- C. In addition to dynamic braking, the drive shall be capable of injecting a DC current into the motor stator to aid in slowing the motor. This braking method shall be available in either normal or emergency stopping modes.
- D. The drive shall be capable of over-fluxing the motor stator to provide up to 30% braking.

### 2.03.3 Control Modes

- A. The adjustable speed drive shall have two distinct modes of operation: 1. Speed control as V/Hz, sensor-less vector, or feedback vector. 2. Torque control, both sensor-less vector and feedback vector.
- B. The drive shall have the ability to switch between modes of operation while running.

#### 2.03.4 Current Detection and Protection

- A. Programmable current detection and protection include:
1. Over-current stall adjustable from 10 to 200% in Heavy Duty (HD) mode, and 10 to 160% in Normal Duty (ND) mode.
  2. Configurable undercurrent detection and response.
  3. UL recognized, speed sensitive, motor overload trip curves adjustable from 10 to 100% of drive Current rating.
  4. Motor 150% OL time limits adjustable from 10 to 2400 seconds.
  5. Overload reduction frequencies to optimize the speed sensitive motor overload to the application & motor characteristics.
  6. Configurable over-torque detection levels, times, and reactions.

#### 2.03.5 Critical (skip) Frequencies

- A. To avoid mechanical resonant frequencies, the drive shall have programming for three programmable critical or skip frequencies.
- B. The jump frequencies may be any frequency less than or equal to the programmed value of maximum frequency.
- C. The jump frequencies shall have a user selectable bandwidth of 0 to 30 Hz.

#### 2.03.6 Drooping Control

- A. The drive shall have a Drooping Control, also called Load Sharing, algorithm that may be used to evenly share the load among multiple motors that are mechanically coupled to a common load.
- B. The drive shall have drooping parameters that allow the user complete control over drooping gain, speed droop and multiple load levels, drooping filters, and drooping torque range.

#### 2.03.7 Process Control (PID)

- A. The drive shall have two internal and external proportional, integral and derivative (PID) control algorithms.
- B. Feedback for the PID algorithm shall be configurable for direct or inverse reaction.
- C. The drive shall be capable of accepting either a 4-20mA or a 0-10V feedback signal from an external device.
- D. The drive shall be capable of operating full time in PID mode or PID may be enabled via discrete input, Electronic Operator Interface, or communications protocol.
- E. A discrete output terminal shall be able to be configured to indicate maximum deviation from set-point.

#### 2.03.8 Electronic Thermal Motor Protection

- A. The drive shall have four independently configurable electronic thermal motor protection levels. These levels will allow the drive to trip based on a motor current that, while less than the drives maximum current is greater than the motor's maximum current.
- B. The electronic thermal motor protection level may be set by the

Electronic Operator Interface, discrete input, communication protocol, or fixed frequency.

- C. The Electronic Thermal Motor Protection shall be speed sensitive and adjustable for motors with speed ranges of 2:1 to 10000:1.
- D. The Electronic Thermal Motor Protection levels shall have configurable 150% motor FLA time limits allowing the user to adjust the  $I^2T$  protection slope.
- E. Correctly setting the electronic thermal motor protection level shall allow the drive to be used as a UL class 10 motor overload protection device.
- F. The drive overload protection shall be capable of automatically de-rating the overload trip point when the unit is operated at a low speed.

#### 2.03.9 Emergency-Off Modes and Settings

- A. Emergency off response shall be configurable to deceleration stop using the currently assigned deceleration time or another deceleration time, coast-to-stop or stop using DC injection braking.
- B. Emergency stop shall be operator initiated via:
  - a. EOI
  - b. Discrete input (multiple E-OFF inputs allowed)
  - c. Communication protocol

#### 2.03.10 Jog

- A. The drive shall have an option for jog run which will allow the motor to run in a specified direction, at a low speed for positioning or initial setup of equipment.
- B. Jog may be initiated from an appropriately configured input terminal, Electronic Operator Interface, or via communication protocol.
- C. Jog frequency may be configured for any frequency from 0.0Hz to 20Hz.
- D. Jog stop method shall be user configurable to coast, controlled deceleration or DC Injection.

#### 2.03.11 Motor Operated Pot (MOP) Emulation

- A. The drive shall have a built in motor operated pot (MOP) emulation that allows discrete momentary inputs to raise or lower speed, a third input may be assigned to clear speed input.
- B. MOP configuration functions include, user-set MOP speed increments, user-set loss of power response, and MOP input terminals.

#### 2.03.12 Override Control

- A. The drive shall have a built in override control which allows one or more analog signals to act as a trim source to a frequency command.
- B. Override may be configured as either an additive input, which may add or subtract frequency from a primary frequency reference, or as a multiplicative input which adds or subtracts frequency as a percentage of the primary reference and the given input.
- C. Override shall be assigned to any analog input, communication option, or Electronic Operator Interface.

#### 2.03.13 Over-voltage Stall

- A. The drive shall have the capability of performing an over-voltage stall to prevent faulting caused by too rapid a deceleration.
- B. During deceleration, over-voltage stall shall extend deceleration time when the DC bus voltage reaches a user configurable level.
- C. The drive shall have the ability to mitigate regenerative energy caused by cyclic overhauling loads. The drive will compensate for rising DC Bus levels by momentarily increasing output frequency.

#### 2.03.14 Preset Speeds

- A. The drive shall be capable of accepting a frequency command via a discrete input. This input will cause the drive to run at a user selectable preset speed.
- B. The drive shall be capable of operating at any of 31, user selectable preset speeds using 5 discrete input terminals in a binary count arrangement.
- C. Each preset speed may have different, user defined, direction, accel/dec times (1 of 4) and patterns, and motor protection characteristics.

#### 2.03.15 Ride-through

- A. The drive shall be capable, in the event of a power failure, of using the inertial energy of the motor rotor and driven equipment to maintain control power.
- B. In the event of a power failure of not more than 10 cycles, the drive shall be capable of maintaining normal operation without interruption.
- C. The drive shall have a user-selectable under-voltage stall level.
- D. After either a loss of power or an under-voltage stall, the drive shall have the ability to synchronize its restart and acceleration with other driven equipment.

#### 2.03.16 Retry/Restart

- A. The drive shall have the ability to automatically restart on non-critical faults.
- B. The drive shall have a user-selectable number of retry attempts, with a maximum of 10 attempts.
- C. If the drive fails to restart after all attempts, the unit will shut down and provide fault indication.

#### 2.03.17 Soft Stall

- A. For variable torque loads, the drive shall have the ability to reduce the output frequency to the motor in the event of a current which exceeds either the settings of electronic thermal motor protection setting or the drive's rated full load amps.
- B. If the current demand of the application drops to a nominal level within a specified time, the output frequency shall return to the commanded output frequency.

#### 2.03.18 Torque Limiting

- A. In order to prevent damage to driven equipment in the event of high torque,



the drive shall have the ability to limit the maximum torque which the motor can develop.

- B. The drive shall have user selectable torque limits from 0 to 250% of rated motor torque.
- C. The drive shall have separate, user selectable torque limits for both positive and negative torque operations.
- D. The torque limits may also be set dynamically by using one of the analog inputs on the drive control terminal strip, the electronics operator interface, or via communications.

#### 2.03.19 Torque Control Mode

- A. The drive shall have the ability to accept and maintain a set-point for torque rather than speed.
- B. When operating in the “torque mode” the drive shall be capable of accepting a torque command from either the electronics operator interface, digital or analog inputs on the standard control terminal strip or communication protocol.
- C. The drive shall have separate settings for maximum speed while operating in Torque mode to prevent the motor from running away.
- D. The drive shall be capable of switching from speed control mode to torque control mode via a digital input on the standard control terminal strip. The drive shall be capable of switching from speed to torque mode or vice versa without stopping the motor.
- E. When the drive is operating in torque control mode, the motor speed will be variable and it is not possible to control the motor speed precisely in this mode.

#### 2.03.20 Vector Motor Modeling

- A. The drive shall make use of the latest in vector control technologies. The drive shall have vector control algorithms for both open loop vector control and vector control which makes use of a pulse train feedback from a PG encoder on the motor shaft.
- B. The drive shall use a mathematical model of the connected motor.
- C. The motor parameters may be adjusted by the user
- D. The drive shall also use an internal auto-tune algorithm to detect motor parameters and create a more accurate motor model for use in vector control topologies.
- E. The drive shall use both a current vector control algorithm as well as a voltage vector control algorithm.
  - 1. The current vector control algorithm shall be used on single motor applications where the motor is the same size as the drive.
  - 2. The voltage vector control algorithm can be used on multiple motor applications and applications where the motor is significantly smaller than the drive.

#### 2.03.21 Application Specific Parameters

- A. The drive shall contain a number of parameters specific to various industrial applications.

#### 2.03.22 Logic operator

- A. The drive shall have parameters for basic logic operations and comparison. These operators shall function in such a way as to allow the drive to be operated similar to a small programmable logic controller.
- B. The parameters shall include basic digital logic operations; AND, OR, ST, SET, RESET C. The parameters shall include comparison Operations  $>$ ,  $<$ ,  $\geq$ ,  $\leq$ ,  $\neq$ .
- D. The drive shall also have available, 2 counters and 5 timers.
- E. All logic operator parameters shall be integrated with the drives internal registers and control terminal strip. Allowing for monitoring of internal conditions as well as inputs and outputs on the CTS.

#### 2.03.23 Calendar Function

- A. The drive shall utilize the real time clock to operate the Calendar function.
- B. Current time shall be set by parameters.
- C. Time zone, daylight savings, and holidays shall be set by parameters.
- D. The Drive shall have Event time stamp functions.

#### 2.03.24 Pump Control Function

- A. Drive shall control multiple pump motors allowing for saved power of the water pump system.
- B. Drive shall control multiple pumps via digital outputs, RS485 communication, or Ethernet communication.

#### 2.03.25 Permanent Magnet (PM) Motor Control

- A. Drive shall be able to control Permanent Magnet (PM) motors.
- B. Drive shall have parameters to properly set up and run PM Motor.

#### 2.03.26. Position Control Function

- A. Drive shall have built-in positioning control function to make the motor stop at a commanded position.
- B. Drive shall make calculations to ensure difference between number of command pulses and number of feedback pulses equals zero.

### 2.04 PROTECTION

#### 2.04.1 Status Indicators

The drive EOI shall have indication for the following conditions:

- Auto-tuning
- Communication abnormality
- DC Braking
- Deceleration stop at power failure

- Display digits overflow
- Easy Mode
- Emergency Off
- Fire speed run/Forced run
- Forward Jog
- Forward/Reverse search
- Initialization
- Lower Limit
- Motor shaft fixing
- Password
- Password failure
- Regional Setting
- Reset command acceptable
- Retry
- Restart
- Reverse Jog
- Run Sleep
- Servo lock
- Standby
- Upper Limit

#### 2.04.2 Alarms

The drive EOI shall have alarm indication for the following alarms. In addition, the drive shall allow one of the digital outputs to be programmed to change state upon an alarm condition.

- STO Activated
- Under-voltage
- Retry
- Point Setting Alarm
- Clear Enabling Indication
- Emergency Stop enabling indication
- Setting Error Alarm
- DC Braking
- Shaft Fixing in Control
- Panel Indication Overflow

- Initialize
- Auto-tuning
- Lower Limit Time-out Stop
- Momentary Power Loss Slowdown
- Tuning Error
- Over-current Pre-alarm
- Over-voltage Pre-alarm
- Overload Pre-alarm
- Overheat Pre-alarm
- Communication Error
- Panel Disconnection
- Key Failure
- Analog input disconnection
- Control power option

#### 2.04.3 Faults

The drive EOI shall clearly annunciate the following fault conditions. In addition, one of the drive digital outputs shall be factory set to change state upon a fault condition.

- Over-current (Acceleration)
- Over-current (Deceleration)
- Over-current (Run)
- Over-current (U-phase arm)
- V-phase Short Over-current (V-phase arm)
- W-phase Short Over-current (W-phase arm)
- Over-current (load side at start)
- Over-current (Braking resistor)
- Overheat
- External thermal trip
- Overload (inverter)
- Overload (motor)
- Overload (Braking resistor)
- Overload (IGBT)
- Over-voltage (Acceleration)
- Over-voltage (Deceleration)

- Over-voltage (Run)
- Over-torque
- Over-torque/over-current
- Low Current Operation
- PTC Failure
- STO circuit fault
- Under-voltage
- Emergency Off
- EEPROM fault Initial Read Error
- Grounding Fault
- Output phase loss
- Input phase loss
- Rush current suppression relay fault
- RAM fault
- ROM fault
- Braking unit internal fault
- CPU Communication
- CPU fault
- Communication Time-out of Braking unit
- Communication Time-out (Embedded Ethernet)Communication Time-out (RS485)
- Communication Time-out (option)
- Gate Array Fault
- Current Detector fault
- Control power option failure
- Optional Unit Fault
- Auto-tuning error
- Motor Constant Setting Error
- Inverter Type Error
- Analog Input disconnecting
- Sequence Error
- PG Encoder Error
- PM control error
- Abnormal Speed Error
- Terminal Input Error

- Abnormal CPU2
- Embedded Ethernet fault
- V/f Control Error
- Battery of panel failure
- Cooling fan fault
- CPU1 Fault
- CPU2 Fault
- Abnormal Logic Input Voltage
- Option fault (slot A)
- Option fault (slot B)
- Option fault (slot C)
- Stop Position Retaining Error
- Brake answer error
- Servo lock error
- GD2 auto-tuning error
- Preparation signal cut during position control
- Position detection upper limit excess

#### 2.04.4 Fault Tracing

The ASD shall have the ability to store up to 10 seconds worth of data on up to four monitor items. The data can be stored in the ASD memory on either a trip or on an input trigger. Stored data can be read back via drive software for integral fault tracing and troubleshooting.

## 2.05 SOFTWARE AND COMMUNICATION

### 2.05.1 Programming Software

The drive manufacturer shall offer a Windows® based programming software that provides the same functionality as the EOI with additional capabilities for data logging, trending, storing and restoring multiple parameter sets.

Cascading windows shall allow a user interface similar to the look and feel of the EOI while allowing direct parameter access. Trending and monitoring functions shall allow up to five items to be graphically displayed on a standard trend chart and logged to a historical data file for future reference.

Computer requirements to run the software are: (at minimum)

- The software shall be capable of running on any standard PC using the Windows operating system.

### 2.05.2 Communications

The drive shall be capable of complete control, monitoring and programming

via any one of the following industrial communications protocols.

- RS485 (2 or 4 wire Embedded)
- CANOpen
- DeviceNet™
- EtherCAT
- PROFIBUS DP
- PROFINET IO
- Modbus® TCP/IP (Embedded)
- Modbus® RTU (Embedded)
- Ethernet/IP (Embedded)
- Toshiba Serial Bus (TSB) protocol

#### 2.05.3. Embedded Web Server

The drive shall have a built-in Web Server function utilizing the embedded Ethernet. Web server must have login and password administration, and can be managed remotely from a PC, smart phone, or tablet.

### PART 3 – CONSTRUCTION REQUIREMENTS

#### 3.01 INSTALLATION

VFD control panels shall be installed as detailed in the Drawings and in strict accordance with manufacturer's recommendations.

#### 3.02 COOLING

Equipment coverings, internal fans and/or air conditioning units shall be installed as required to keep temperature within the manufacturer's recommended operating range. However, the panel enclosure shall be securely protected from external moisture from rain and high humidity.

#### 3.03 MOUNTING

VFD control panels shall be securely mounted as indicated on the project drawings and grounded according to all applicable codes. Installation shall be secure and capable of withstanding hurricane force winds.

### PART 4 – MEASUREMENT AND PAYMENT

- 4.01 Variable Frequency Drive and Starter Panel with Boxes and Mounts - This pay item shall be measured on a "per each" basis and shall include all labor, equipment, materials including data cable and power cable along with all other items required for a complete and fully functional final product. The pump controller panel shall not be included in this pay item but shall be a separate item.

END OF SECTION

SECTION 16140  
BOOSTER STATION CONTROLS

PART 1 – GENERAL

1.0 DESCRIPTION

This work shall consist of furnishing and installing all necessary instrumentation, wiring and controls required for a complete and fully functional station to include pumps, hydropneumatic tank and pressure devices.

1.1 BASIC ELECTRICAL MATERIALS AND METHODS

1.1.01 ELECTRICAL SPECIFICATIONS

The electric supply will be 120/240 volts, three phase, four wire, 60 Hertz. The Contractor shall contact the power company prior to bidding and include in his bid the cost of labor and material necessary to supply the plant with electricity, including any cost which may be assessed by the power company for installation of power company furnished material. The Contractor shall coordinate all aspects of the construction concerning the electric service with the power company. The Approval Drawings shall include all details of the power company electric service and all associated equipment (to include all pole types and locations, switches, fuses, wire sizes and types, etc.) anywhere on the plant property.

1.1.02 TEMPORARY ELECTRIC SERVICE

The Temporary Electric Service for construction power shall be furnished, installed, and removed by the electrical contractor. Also, the Contractor shall make all necessary arrangements with the power company for metering and billing and provide for these charges and cost in his bid.

1.1.03 TESTING AND INSPECTIONS

Contractor shall assist in making periodic inspections or tests as required by the Engineer. When required, Contractor shall provide the assistance of foreman and qualified craftsmen for reasonable duration of each test, etc. Cooperate with other Contractors in preventing premature operation of equipment like water process equipment, etc., which should be first run in presence of personnel responsible for each item.

After wiring is completed, the Contractor shall test for shorts and open circuits, intentional and unintentional grounds. All shorts, open circuits, and unintentional grounds shall be corrected

1.1.04 GUARANTEE

Workmanship and materials shall be guaranteed for period of one year from date of official acceptance of contract. Be responsible for any adjustments, replacements and corrections necessary to restore project to first-class condition if deficiency is due to faulty workmanship or materials.



### 1.1.05 CONDUIT SYSTEMS

Use galvanized or sheradized steel conduit in damp locations, exterior walls, exposed out of doors or when subject to mechanical damage after installation. Underground runs, use PVC, schedule 80 incased in concrete per NEMA standards and buried at required depth per NEMA standards. Provide electrical line red warning tape buried six (6) inches above conduit run. Protect conduits against entry of debris; keep ends capped during construction; clear or replace obstructed conduits.

Size and install conduits so that conductors may be installed without damage or excessive strain, using NEC as a minimum standard. For rigid conduit use double lock nut and bushings. For conduits larger than 1", use grounding type insulation bushing. Entire conduit system shall provide a dependable path to ground. EMT fittings shall be watertight type, T&B 5100 series. Crimped or set screw types are not acceptable.

Ream ends after threading. Make bends with an approved bending tool. Replace deformed bends or off-sets. Avoid hot water pipes, stay at least 3" from covering of hot pipes except as crossing, then at least 1".

### 1.1.06 PULL BOXES AND JUNCTION BOXES

Pull boxes shall be code gauge and size galvanized steel and shall be installed where accessible and in location shown on the drawings or where required to facilitate the easy pulling of wires. Boxes shall be sized properly for the conduits and wires entering them. In outdoor and process areas use weatherproof and corrosion resistant boxes.

### 1.1.07 OUTLET BOXES

On exposed conduit in process areas, use Crouse-Hinds No. FS or FD or other galvanized steel types. All boxes galvanized, or cadmium plated, or better.

### 1.1.08 CONDUCTORS AND GENERAL WIRING METHODS

Type THW 600-volt copper wire for general use and types THHN 600-volt copper for High Ambient Temperature; where Contractor sizes conduit based on conductor required, basis is type THW. Approved manufacturers, Triangle, General Cable, Collyer, National Electric Products, or approved equal. Size, type and trade name stamped permanently at regular intervals on all conductors. All wire shall be color coded.

Install wire in conduit after all work, which may cause damage, is completed. Powdered talc or other approved compound may be used as lubricant where necessary.

Make joints and splices in conductors with approved insulating type compression fittings, T&B, Sta-kon, or Buchanan splice caps. Wire-nuts are not acceptable.

### 1.1.09 GROUNDING AND BONDING REQUIREMENTS

In order to provide a safe and reliable system, all structures, piping, equipment and electrical services involved must be properly grounded and bonded to a properly sized and installed grounding electrode system.

All work will comply with every facet of the National Electric Code Article 250, current edition. Particular attention must be given to sections 250.56 and 250.58.

The article 250 requirement for a ground resistance of 25 ohms or less shall be considered as the minimum and a resistance of 4 ohms or less shall be the goal. This resistance will be measured with equipment using a three point resistance measurement and "fall of potential" system.

Ground and elevated water tanks are a major source of danger and damage due to lightning and transient voltages. Because of this, these structures will have as a minimum, a ground ring completely around the structure consisting of #2/0 bare copper wire and 10 foot long by 3/4" diameter copper clad ground rods. The rods shall be spaced no more than 12 feet apart. There will be at least 4 radials to the tank legs or structure. All connections will be exothermic (Cadweld) performed by qualified personnel. All devices located at these tanks will be bonded to the ring.

All motor control centers and control panels shall have as a minimum, a ground ring near the structure or building consisting of #2/0 bare copper and 10 foot long by 3/4" diameter copper clad ground rods. There will be at least three (3) ground rods spaced no more than twelve (12) feet apart to make a grounding "ring". All connections will be exothermic (Cadweld) performed by qualified personnel. All devices located near the structure or building shall be bonded to the ground ring.

Other structures will have a grounding system appropriate for the location per the National Electric Code article 250.

Conduit work, motors, panel boards and electrical equipment are to be effectively and permanently grounded. Feeder conduits shall provide a good path to system ground.

The grounding screw on all grounding type receptacles shall be securely grounded to the outlet box with lug and screw, or use self-grounding types.

Verify electrical continuity of all conduit runs and correct any discrepancies.

The Contractor shall be responsible for determining the extent of grounding and bonding requirements for equipment located at the site(s) covered under the contract(s) as listed herein. The Contractor shall provide for these charges, and cost in his bid.

#### 1.1.10 EXCAVATION AND BACKFILLING

Excavate trenches for underground conduit or cable to required depth and width. After conduit or cable has been installed, inspected, and approved, backfill trench with earth free of trash, rock, brick and debris, and compact as required. Under slab, follow compaction rules for general work on this project. Underground workmanship applies under slab; depth can be reduced, but provide full and complete encasement. Bond conduit to any membrane passed through.

#### 1.1.11 CLEANING

As required, clean all equipment or exposed material provided or installed under this section. Protect from any normal use of paint, mortar, etc.

1.1.12 WORKMANSHIP

All work shall be done in a thorough, substantial, and workmanlike manner by competent workmen. Applicable rules of National Electric Code apply as minimum standard for this contract but do not replace or reduce any specific requirement herein.

1.1.13 INTERFERENCES

The drawings are generally diagrammatic. Cooperate with other trades so that interferences of conduit, equipment, piping, etc., will be avoided. If interference develops, refer promptly to Engineer for decision.

1.2 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

1.2.01 DESCRIPTION

- A. This section specifies the general grounding and bonding requirements for electrical equipment and operations to provide a low impedance path for possible ground fault currents.
- B. "Grounding electrode system" refers to all electrodes required by NEC, as well as made, supplementary, and lightning protection system grounding electrodes. The terms "connect" and "bond" are used interchangeably in this specification and have the same meaning.

1.2.02 SUBMITTALS

- A. Shop Drawings:
  - 1. Clearly present enough information to determine compliance with drawings and specifications.
  - 2. Include the location of system grounding electrode connections and the routing of aboveground and underground grounding electrode conductors.
- B. Test Reports: Provide certified test reports of ground resistance.
- C. Certifications: Two weeks prior to final inspection, submit four copies of the following to the Project Engineer:
  - 1. Certification that the materials and installation are in accordance with the drawings and specifications.
  - 2. Certification by the Contractor that the complete installation has been properly installed and tested.

1.2.03 APPLICABLE PUBLICATIONS

Publications listed below (including amendments, addenda, revisions, supplements, and errata) form a part of this specification to the extent referenced. Publications are referenced in the text by designation only.

- A. American Society for Testing and Materials (ASTM):
  - B1-07.....Standard Specification for Hard-Drawn Copper Wire
  - B3-07.....Standard Specification for Soft or Annealed Copper Wire
  - B8-04.....Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft

- B. Institute of Electrical and Electronics Engineers, Inc. (IEEE):  
81-1983.....IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System  
C2-07.....National Electrical Safety Code
- C. National Fire Protection Association (NFPA):  
70-08.....National Electrical Code (NEC)  
99-2005.....Health Care Facilities
- D. Underwriters Laboratories, Inc. (UL):  
44-05.....Thermoset-Insulated Wires and Cables  
83-08.....Thermoplastic-Insulated Wires and Cables  
467-07.....Grounding and Bonding Equipment  
486A-486B-03.....Wire Connectors

### 1.3 PROCESS INSTRUMENTATION AND CONTROL

#### 1.3.01 WORK INCLUDED

The work covered under this section of the specifications includes the furnishing and installing of all instrumentation and control hereinafter specified to perform the intended function.

## PART 2 – MATERIALS

### 2.1 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

#### 2.1.01 GROUNDING AND BONDING CONDUCTORS

- A. Equipment grounding conductors shall be UL 44 or UL 83 insulated stranded copper, except that sizes No. 10 AWG [6 mm<sup>2</sup>] and smaller shall be solid copper. Insulation color shall be continuous green for all equipment grounding conductors, except that wire sizes No. 4 AWG [25 mm<sup>2</sup>] and larger shall be identified per NEC.
- B. Bonding conductors shall be ASTM B8 bare stranded copper, except that sizes No. 10 AWG [6 mm<sup>2</sup>] and smaller shall be ASTM B1 solid bare copper wire.
- C. Conductor sizes shall not be less than shown on the drawings, or not less than required by the NEC, whichever is greater.
- D. Isolated Power Systems (if applicable): Type XHHW-2 insulation with a dielectric constant of 3.5 or less.

#### 2.1.02 GROUND RODS

- A. Steel or copper clad steel, 0.75 in [19 mm] diameter by 10 ft. [30 M] long, conforming to UL 467.
- B. Quantity of rods shall be as required to obtain the specified ground resistance, as shown on the drawings.

#### 2.1.03 CONCRETE ENCASED ELECTRODE

Concrete encased electrode shall be No. 4 AWG bare copper wire, installed per NEC.

#### 2.1.04 GROUND CONNECTIONS

- A. Below Grade: Exothermic-welded type connectors.
- B. Above Grade:
  - 1. Bonding Jumpers: Compression-type connectors, using zinc-plated fasteners and external tooth lock washers.
  - 2. Connection to Building Steel: Exothermic-welded type connectors.
  - 3. Ground Bus bars: Two-hole compression type lugs, using tin-plated copper or copper alloy bolts and nuts.
  - 4. Rack and Cabinet Ground Bars: One-hole compression-type lugs, using zinc-plated or copper alloy fasteners.

#### 2.1.05 EQUIPMENT RACK AND CABINET GROUND BARS

Provide solid copper ground bars designed for mounting on the framework of open or cabinet-enclosed equipment racks with minimum dimensions of 0.375 in [4 mm] thick x 0.75 in [19 mm] wide.

#### 2.1.06 GROUND TERMINAL BLOCKS

At any equipment mounting location (e.g., backboards and hinged cover enclosures) where rack-type ground bars cannot be mounted, provide screw lug-type terminal blocks.

#### 2.1.07 GROUNDING BUS

Pre-drilled rectangular copper bar with stand-off insulators, minimum 0.25 in [6.3 mm] thick x 4 in [100 mm] high in cross-section, length as shown on drawings, with 0.281 in [7.1 mm] holes spaced 1.125 in [28 mm] apart.

### 2.2 PROCESS INSTRUMENTATION AND CONTROL

#### 2.2.01 SYSTEM SUPPLIER

- A. All instrumentation and control systems equipment shall be furnished by a System Supplier. The System Supplier shall provide and be responsible for the proper operation of all Process Instrumentation and Controls and Control Panels. The System Supplier shall perform in house submittal drawings and assembly of products. Subcontracting submittal drawings and equipment assembly will not be permitted.
- B. Substitutions of functions or equipment specified will not be acceptable.
- C. The entire system shall be warranted for one year from date of substantial completion.
- D. The Contractor shall assign full responsibility for the function operation of all new instrumentation and control systems to a System Supplier. This System Supplier shall be responsible for all coordination necessary in order to select, to furnish, to supervise installation and connections, to calibrate, and to place into operation all instrumentation and controls along with all other equipment and accessories as

specified herein. The System Supplier shall be a licensed electrical contractor in the state of Mississippi.

- E. The System Supplier shall be one of established favorable reputation who has designed and produced similar systems and components for a period of at least (10) ten years.
- F. It shall be required of the System Supplier to execute and submit a guarantee to assume full responsibility as defined in Section 2.01, paragraph 'A' above. It is the duty of the Contractor to include this guarantee with his Bidding Documents.
- G. Only the guarantee of the System Supplier whose name the Contractor has inserted in his Bidding Documents is required. Failure by a System Supplier to provide a written guarantee with his proposal shall be deemed by the Contractor as "NO BID" and that System Supplier will not be acceptable. The written guarantee shall be on the named System Supplier's letterhead and shall be signed by a responsible representative who will be primarily involved in the fulfillment of this guarantee. The written guarantee shall be stated as follows:

"... (Name of Single Source System Supplier)...guarantees that the proposal offered provides for complete compliance with all requirements of this section of the project specifications without exceptions to these specifications.

Full responsibility will be placed upon... (Name of Single Source System Supplier)...for all coordination necessary to select, to furnish, to supervise installation and connections, to calibrate, and to place into operation Process Instrumentation and Controls, Control Panels, and all other equipment and accessories needed to provide a complete operating system to comply with requirements of this section of the project specifications.

... (Name of Single Source System Supplier)... guarantees to provide all submittal drawings, instruction manuals, and qualified personnel for specified field services and training, all as defined within this section of the project specifications."

... (Name of Single Source System Supplier)... is a licensed electrical contractor in the state of Mississippi; Certificate of Responsibility No. \_\_\_\_\_, name of qualifying party \_\_\_\_\_;

Guarantee on system function and equipment shall be one (1) year from date of substantial completion or partial acceptance.

## 2.2.02 SUBMITTAL DRAWINGS

- A. Descriptive literature and drawings for equipment and systems being furnished under this section shall be included in two submittals as a maximum. If two submittals are made, the first shall include all primary devices, transmitters, sensors, and field mounted equipment. The second submittal will include the balance of the submittal required. The submittal shall include as a minimum, equipment specifications, dimensional drawings, flow and other calculations, schematic drawings of each and every system within the complete offering, and

such other information requested by the Engineer or considered necessary to the proper installation of the equipment. Furnish submittals in a Bound Booklet Form 8.5" X 11". No sheets shall be larger than 8.5" X 11". Foldout larger sheets will not be acceptable. This submittal shall include coordinated information and drawings for all items that the Single Source System Supplier is required to furnish under this section of the specifications, all in one integrated and coordinated manual. Each item of a submittal shall carry the appropriate title and be indexed against the appropriate specification item.

- B. A quantity of eight (8) sets of submittals shall be furnished for the Engineer's approval.

### 2.2.03 INSTRUCTION MANUALS

Prior to 65% of the value of job completion, System Supplier shall furnish two (2) copies to the Engineer and one (1) copy to the Owner of all descriptive matter and complete system operation instruction manuals in separate indexed binders coordinated with the equipment that is furnished and installed for approval. System Supplier shall incorporate Engineer's comments and resubmit for approval within thirty (30) days of receipt of Engineer's comments. Once final approval is obtained, System Supplier shall furnish two (2) copies to the Owner and two (2) to the Engineer.

### 2.2.04 RELATED SYSTEM COMPONENTS

The attention of the System Supplier is called to sections concerned with electrical work, chemical feeders, valves, piping, etc., and such other devices not specified under this section, but related to it

## 2.3 CONTROL PANELS

### 2.3.01 GENERAL

- A. Enclosure shall be constructed of a minimum 16 gauge, galvanized steel with stainless steel, quarter turn, quick-release latching mechanisms and a padlocking hasp. Enclosure shall be factory painted with white polyester powder paint inside and out over pretreated surfaces. The enclosure shall be rated NEMA Type 3R and manufactured by Hoffman, Electromate or approved equal. Enclosure backplate shall be a minimum of 12-gauge steel, finished with white polyester powder paint or a conductive, corrosion-resistant coating.
- B. All power and control wires shall be stranded copper type MTW. All wiring shall be in covered plastic wireway.
- C. All points necessary for external connection in the controller, whether power or control, shall be wired to a terminal strip located at the top or bottom of the enclosure as directed by the engineer. The terminal strip shall be permanently marked with the same designation as the wire connected to it.
- D. All power and control wires shall be marked at both ends using self-adhering wire markers. No two wires having different functions within the control panel shall have the same markings.

- E. All circuit breakers, starters, and other control devices mounted within the controller panel shall be labeled for identification both within the panel and on the wiring schematic with corresponding designations.
- F. Control power shall be 120 volts and shall be protected by a correctly sized circuit breaker. If required, provide a properly sized control power transformer with primary over current protection.
- G. Each starter shall be provided with overload protection in all three phases and each individual starter shall have phase failure protection.
- H. All selector switches, pilot lights and control devices shall be visible and operable from the Controller exterior door or an interior deadfront panel when required. The deadfront panel shall be constructed of anodized aluminum and shall have a continuous aluminum hinge. An anodized aluminum deadfront shall be utilized when the Controller environment is not conducive to exposed controls or as specified on drawings.
- I. All approval drawings shall be prepared per J.I.C. standards for engineers review prior to any fabrication of control equipment. The Controller shall be produced by a UL 508 listed shop. Proof of label availability shall be submitted with above drawing.
- J. The controller manufacturer shall provide a written warranty with approval drawings covering all Control materials and parts furnished for a period ending one year after final acceptance of the project. This warranty shall cover all material replacement, all labor, and all travel expenses.
- K. The controller manufacturer shall show satisfactory evidence that he maintains a fully equipped factory organization capable of furnishing adequate service for the equipment furnished, including replacement parts within a 100 mile radius of the job site. Suppliers employing outside organizations for "ON CALL" service shall not be considered.
- L. The controller manufacturer shall have a service department capable to respond in emergency condition twenty-four/seven and three-hundred sixty-five days a year (24/7/365).
- M. The quality establishing brand for the control panel(s) shall be that as manufactured by Control Systems, Inc. of Jackson, MS.

#### 2.3.02 BOOSTER STATION CONTROL PANEL

- A. **SERVICE ENTRANCE:** Control panel shall be designed for 120/240-volt, three-phase, four-wire power. The control panel shall be rated NEMA 3R, as indicated on drawing.
- B. **MAIN BREAKER:** Provide a properly sized Main Breaker, as shown on the drawings. In addition, provide a through the door operator mounted on the interior deadfront. The operator shall prevent the deadfront from being opened while the breaker is in the "ON" position.



- C. **POWER DISTRIBUTION BLOCKS:** Provide properly sized Power Distribution Block(s) (PDB), as required for the control panel. Power distribution blocks shall be UL Listed and rated for the voltage and ampere rating as required; manufactured by Marathon, Square D, or approved equal. Provide necessary lugs for service entrance neutral.
- D. **SERVICE ENTRANCE SURGE PROTECTION DEVICE:** Provide a service entrance rated Type 2, AC power distribution Surge Protection Device (SPD), per Component Specifications, designed to protect all types of loads fed from the distribution panels, branch panels and/or individual equipment panels. Units shall be UL listed and shall bear a UL label. Surge Protection Device shall be rated for 120kA per phase and 60kA per mode.
- E. **POWER MONITOR:** Provide a service entrance rated Power Monitor (PM), per Component Specifications. Power monitor shall constantly monitor the three-phase voltages to detect harmful power line conditions, caused by single-phasing, low voltage, phase reversal, and voltage unbalance. When a harmful condition is detected, no three-phase motors shall be allowed to operate. Phase monitor shall be protected by 1 amp, 240 volt fuses on the primary side.
- F. **BOOSTER PUMP NO. 1:** Provide a properly sized combination circuit breaker and NEMA rated motor starter with Class 10, ambient compensated overload protection and individual phase failure protection as indicated on drawing, for the pump. In addition, provide the following equipment and controls.
1. Provide a Simplex Controller's (SC-1), per Component Specifications, for the pump. In the automatic mode, the Simplex Controller's shall receive start and stop commands from the Hydropneumatic Tank Control Panel as described below in Section 4.03, based on hydropneumatic tank level. The Simplex Controller shall be a standard, catalogued product of a water and wastewater automation equipment manufacturer regularly engaged in the design and manufacture of such equipment for a period of at least fifteen (15) years. The simplex controller shall have the following indicators and controls:
    - a. Manual-Off-Automatic selector switch
    - b. Amber "Call" pilot light
    - c. Green "Pump Running" pilot light
    - d. Red "Pump Failure" pilot light
    - e. Red "SPARE" pilot light
  2. Provide a Motor Monitor (MM-1) complete with properly sized Current Transformer, both per Component Specifications, for the pump. The Motor Monitor's shall provide a positive run signal, monitor motor running current, and indicate motor running time and motor full load running amperes. In addition, motor monitor shall come complete with high or low amperes set points for the pump.
- G. **BOOSTER PUMP NO.2:** Provide the same equipment and controls as provided for booster pump no.1.
- H. **BRANCH CIRCUIT BREAKERS:** Provide the following 120 Volt, single-phase

branch circuit breakers.

1. 20 Amp – 1 Pole, for Control Power and Alarm Light
2. 30 Amp – 1 Pole, for Hydropneumatic Tank Control Panel

- I. COMMON ALARM LIGHT: Provide a weatherproof exterior common Alarm Light (AL), per Component Specifications with red Lexan lens mounted on side of enclosure. The alarm light shall burn dim during normal conditions to indicate “Power On” and “Light Bulb Good” and shall flash brightly during any alarm condition.

### 2.3.03 HYDROPNEUMATIC TANK CONTROL PANEL:

Provide a Hydropneumatic Tank Control Panel (HTC), as described below and as shown on drawings. The Hydropneumatic Tank Controller shall be furnished and installed as a combination pressure and level control system including all pressure controls, air compressor controls, air release electric solenoid, tank Pressure Meter/Controller (PMC-1) with automatic level controls, tank level sight gauge, tank pressure gauge, thermostatically controlled freeze protection and weather proof duplex receptacle. Provide a thermostatically controlled cabinet heater mounted inside the controller. Cabinet heater shall be 250 Watt, 120V AC with field adjustable thermostat in NEMA 1 enclosure. Heater shall be wired with high temperature wire and connectors. Thermostat shall be adjustable from 50°F to 90°F with 2°F fixed differential and mounted on the backplate of the enclosure. Duplex receptacle shall come complete with a weatherproof cover. Cover shall be UL listed for wet locations, with cover closed, and shall be constructed of tough plastic that is resistant to high impact and sunlight. In addition, the cover shall be non-corrosive, non-conductive and protect against rain, snow and ice. The control system shall accurately and automatically maintain the correct air/water ratio in the pressure tank at all times. All the above-described equipment shall be housed in one single factory built enclosure. The complete unit shall be pre-wired, adjusted and tested at the factory for proper system operation prior to shipment. The Control Panel shall include a Pressure Meter/Controller (PMC-1) and a Pressure Sensor (PT-1), both per Component Specifications, for Pump(s) Start/Stop and for air pressure control. The pressure control for the system shall be set from within the control system enclosure. Provide Manual-Off-Automatic selector switches for each pump or well and for the air compressor. The enclosure shall be equal to NEMA 4X, constructed of fiberglass and light gray in color. The enclosure shall be lockable to prevent entry of unauthorized personnel. Enclosure shall be constructed with sectionalized interior control compartments to house all electrical control components and for selector switch mounting. The system shall have a pressure range from high pressure of 100 PSI to a low pressure of 60 PSI. The hydropneumatic tank control system shall be equal to the HYDRO WATCH panel as manufactured by Control Systems, Inc., Jackson, Mississippi.

Additionally, provide necessary probes and probe holder to be mounted in the top of the collector tank to provide a pump low-level lockout signal to the hydropneumatics tank controller. In the automatic mode, the pumps shall be prevented from operating during a collector tank low-level condition.

And also additionally, provide an air compressor sized to provide adequate air flow to operate the tank size and its void space provided in the plans to function as described herein and implied on the plans. At a minimum this air compressor shall be capable of a maximum air pressure of 105 PSI at 4.3 CFM.

## 2.4 CONTROL PANEL COMPONENTS

### 2.4.01 SERVICE ENTRANCE SURGE PROTECTION DEVICE

The Surge Protection Device (SPD) shall be mounted in the control panel / motor control center section adjacent to the Main Breaker. The SPD is connected to the main bus in the panel with conductors of size and of no greater length than indicated in the Surge Protection Device manufacturer's installation instructions. SPD shall be a Type 2 device ideal for distribution panels, branch panels and critical loads.

- A. SPD shall provide transient voltage surge suppression and electrical high frequency noise filtering. Unit is designed for parallel connection to the main bus. SPD unit uses selenium cells and metal oxide varistors to achieve its performance. Products using gas tubes, spark gaps, silicon avalanche diodes or other components, which under failed conditions would cause system failure, are not acceptable.
- B. Manufacturer qualifications: The product of a manufacturer engaged in the commercial design and manufacture of the type of product described herein for a minimum ten (10) years.
- C. Standards: Product complies with the requirements of the following:
  - 1. cUL
  - 2. CE Compliant
  - 3. UL 1449 3<sup>rd</sup> Edition
  - 4. UL 1283 Listed
  - 5. NEMA LS1 Compliance
- D. Operating Voltage: 120/240 volts, 3-phase, 4-wire + ground
- E. Maximum Continuous Operating Voltage (MCOV): greater than 115 percent of nominal voltage for all products. All suppression filter systems comply with NEMA LS 1.
- F. Frequency: Operating frequency range of 47 – 64 Hertz.
- G. Protection Modes: all phases – phase to ground; all phases – phase to neutral; all phases – phase to phase; and neutral to ground.
- H. Rated Single Pulse Surge Current Capacity: at rated voltage, no less than:
  - 120,000 A Line to Line
  - 60,000 A Line to Neutral
  - 60,000 A Line to Ground
  - 60,000 A Neutral to Ground
- I. Tested Single Pulse Surge Current Capacity: Filter system is designed to withstand a single pulse surge current up to 150 percent of the design rating and tested at an independent test laboratory. In the absence of testing facilities capable of such testing, testing of individual components or sub-assemblies

within a mode is accepted by ANSI C62.41-1991; the testing includes a Category C1 surge test followed by a second Category C1 test. The test results demonstrate the unit does not degrade by more than 10 percent from the initial test.

- J. Clamping Voltage: Suppression filter system clamping voltages are in compliance NEMA LS1-1992.
- K. High Frequency Filter: EMI-RFI noise rejection or attenuation values comply with test and evaluation procedures of NEMA LS1-1992.
- L. Overcurrent Protection: Unit includes coordinated UL 489 or UL 198 listed or recognized overcurrent protection devices; if fuses are used unit incorporates non-encapsulated, field replaceable fuses.
- M. Documentation: Provide product data including equipment manual, electrical and mechanical drawings indicated dimensions weights, mounting provisions, connection details and layout diagram, certified tests of UL 1449 Listing/Clamp Voltages and NEMA LS1 compliance, certified single pulse surge current capacity testing, and minimum repetitive surge current capacity testing.
- N. Status Indicators: Unit has long-life, solid state, externally visible status indicators that monitor the on-line status of each phase of the unit.
- O. Warranty: 15-years Unlimited Free Replacement for service entrance Surge Protection Device.
- P. Service entrance Surge Protection Device system shall be equal to Surge Suppression Inc. Model SSMA12-3D1.

TAG  
SPD

SERVICE  
Service Entrance Surge Protection Device

#### 2.4.02 PHASE FAILURE/UNBALANCE/UNDER VOLTAGE/REVERSAL RELAY

Phase monitor shall be designed to protect 3-phase motors regardless of size and for use with 200 – 240 or 425 – 485 VAC, 50 to 60 Hz motors to prevent damage. The unit shall constantly monitor the three phase voltages to detect harmful power line conditions, caused by single phasing, low voltage, phase reversal and voltage unbalance. When a harmful condition is detected, an output relay is deactivated after a trip delay. The output relay shall reactivate after power line conditions return to an acceptable level for the specified Restart Delay. The trip delay shall prevent nuisance tripping due to rapidly fluctuating power line conditions. Phase monitor shall have the following features and functions.

- A. Under Voltage:
  - Trip: -15% of setting for 230V (-10% for 480V)
  - Reset: -12% of setting for 230V (-8% for 480V)
- B. Over Voltage:
  - Trip: -15% of setting for 230V (-10% for 480V)
  - Reset: -12% of setting for 230V (-8% for 480V)

- C. Phase Unbalance:  
 Trip: 7% with 5 second trip delay  
       15% with 1 second trip delay  
 Reset: 6%
- D. Trip Delay:  
 5 seconds (delay is reduced to 1 second if Phase Unbalance is 15% or greater)
- E. Reset Delay:  
 2 seconds standard (5-60 seconds optional)
- F. Voltage Range: 200V to 240V or 425V to 525V
- G. Output Rating: 10A resistive @ 240VAC  
                   6A resistive @ 240VAC
- H. Operating Temp: -40°C to +50°C, -38°F to +122°F
- I. Storage Temp: -45°C to +85°C, -47°F to +185°F
- J. Enclosure: Lexan, surface mount
- K. UL and cUL listed

TAG  
PM

SERVICE  
Electrical System Power Monitor

#### 2.4.03 SIMPLEX CONTROLLER

Provide a Simplex Controller including the following features.

- A. Manual-Off-Automatic selector switch, green "Aerator Running" pilot light, red "Aerator Failure" pilot light, and a amber "Aerator Call" pilot light.
- B. Control inputs shall be optically isolated and their power limited to 24V DC with a maximum current of 16mA DC for intrinsic safety.
- C. Provide Common Alarm controls, which include a dry-contact output and flashing exterior alarm light output. The controls shall activate the dry-contact output and flash the alarm light output during aerator failure.
- D. Provide an aerator failure dry-contact output and flashing alarm indicator. The failure controls shall energize the dry-contact output, flash the aerator failure alarm indicator and energize the common alarm circuitry if the aerator fails to run when called for while in the Automatic mode of operation.
- E. The Manual-Off-Automatic switch shall bypass all of the controls and energize the aerator call-for dry-contact output when placed in the Manual position. In the Manual and Off positions the aerator failure alarm shall be disabled.
- F. The Manual-Off-Automatic switch shall be used to reset a aerator failure alarm after the failure condition has been cleared, by manually switching the aerator to the Off position and back to Automatic.
- G. Provide a field adjustable time delay to prevent aerator failure signal from being activated until the controller has had time to receive a aerator "Running" signal. The timing range shall be adjustable from 5 seconds to 5.25 minutes. During aerator failure conditions, provide the following controls.

1. Red "Aerator Failure" pilot light on face of controller shall flash when activated.
  2. Activate the Common Alarm relay and exterior flashing light output.
  3. Provide a dry type contact closure for remote alarming that will activate during "Aerator Failure" condition.
- H. The Simplex Controller shall be solid state and easily replaceable. Conventional relay and/or timer construction is not acceptable.

<u>TAG</u>	<u>SERVICE</u>
SC-1	Booster Pump No.1 Simplex Controller
SC-2	Booster Pump No.2 Simplex Controller

#### 2.4.04 MOTOR MONITOR

Provide an electronic solid state Motor Monitor with proportional 4-20mA output, powered by 120 volt AC that will accept a zero (0) to five (5) amp input signal condition the signal to perform ON/OFF or OPEN/CLOSE discrete dry type setpoint contact conditions based on the input signal value. The Motor Monitor shall have the following features.

- A. Provide an LCD readout meter providing field adjustable scales of 0-25.0, 0-50.0, 0-100.0, 0-250, 0-500 and 0-1000 to accurately indicate the motor full load current using the 0-5 amp input signal.
- B. The Monitor shall be capable of displaying motor total running time up to 99,999.9 hours and be provided with reset capability from the rear of the monitor. The display shall include a non-volatile EEPROM memory backup that does not require battery backup during power failure.
- C. Provide two (2) separate field adjustable setpoints, each with discrete, isolated sealed SPDT relay output contacts. The setting of each setpoint shall be adjustable throughout the complete signal range from the front of the Monitor. Each set point shall be provided with a field adjustable "ON" and "OFF" time delay, adjustable from zero (0) to fifteen (15) seconds. The actual setting of each setpoint shall be able to be displayed on the LCD readout at any time. An LED indicator shall be provided for each setpoint and shall operate as follows:
  1. Setpoint No. 1: When setpoint is timing, the indicator shall burn amber. After timing period and current is at or above setpoint, indicator shall burn green.
  2. Setpoint No. 2: When set point is timing, the indicator shall burn amber. After set timing period and current is at or above setpoint, indicator shall burn red.
- D. Provide a 4-20mA or a 1-5Vdc output signal which is proportional to the amperes being measured. Load maximum impedance should not exceed 330 ohms. Output signal shall be factory calibrated.

TAG  
MM-1  
MM-2

SERVICE  
Booster Pump No. 1 Motor Monitor  
Booster Pump No. 2 Motor Monitor

#### 2.4.05 CURRENT TRANSFORMER

Current transformers insulation class shall be 0.6 KV BIL, 10 KV Full Wave. They shall be manufactured to meet the requirements of UL1244 and have a minimum accuracy of 60Hz of 2%. Current transformers shall be provided with brass stud terminals and mounting bracket.

#### 2.4.06 PRESSURE SENSOR

Provide a non-submersible Pressure Sensor with the proper operating range for the project in question. Sensor shall meet the requirement for CE marking of EN50081-2 for emissions and EN50082-2 for susceptibility and shall have exceptional Proof Pressure and Stability along with Vacuum up to 6000 PSI (400 bar). Pressure sensor shall be able to survive most pressure spikes caused by pump ripple, solenoid valves, etc. In addition, pressure sensor shall have the following features and functions.

- A. Pressure Range: Vacuum to 400 bar (6000 psi)
- B. Proof Pressure: 4 x Full Scale (FS) (<1% FS Zero Shift)
- C. Burst Pressure: >35 x FS <= 4 bar (60 psi);  
>20 x FS <=40 bar (600 psi);  
>5 x FS <=400 bar (6000 psi)
- D. Fatigue Life: Designed for more than 100 million FS cycles
- E. Supply Voltage Sensitivity: 0.01% FS/Volt
- F. Long Term Drift: 0.2% FS/year (non-cumulative)
- G. Accuracy: 0.5 % FS typical (optional 0.15% FS)
- H. Thermal Error: 2.0% FS typical
- I. Compensated Temperatures: -20°C to 80°C (-5°F to 180°F)
- J. Operating Temperatures: -40°C to 125°C (-22°F to 260°F)
- K. Zero Tolerance: 1% of span
- L. Span Tolerance: 1% of span
- M. Response Time: 0.5 ms
- N. Pressure Port: 1/4-18 NPT External
- O. Wetted Parts: 17-4 PH Stainless Steel
- P. Enclosure: 316 SS, 17-4 PH SS
- Q. Vibration: 70g, peak to peak sinusoidal, 5 to 2000 Hz; (Random Vibration: 20 to 200 Hz @ =20g Peak per MIL-STD.-810E Method 514.4)
- R. Acceleration: 100g steady acceleration in any direction 0.032% FS/g for 1 bar (15 psi) range decreasing logarithmically to 0.0007% FS/g for 400 bar (6000 psi) range.
- S. Shock: 20g, 11 ms, per MIL-STD.-810E; Method 516.4 Procedure I
- T. Approvals: CE, UR (12 ET, 16 ET Intrinsically safe)
- U. Voltage Output Units: Output: 4-20 mA; Supply Voltage (Vs): 1.5 Vdc above span to 35 Vdc; Min. Load Resistance: (FS output / 2) Kohms
- V. Current Output Units: Output: 4-20 mA (2 wire); Supply Voltage (Vs): 24 Vdc, (7-35 Vdc); Max. Loop Resistance: (Vs-7) x 50 ohms

TAG  
PT-1

SERVICE  
Hydropneumatic Tank Pressure Sensor

#### 2.4.07 PRESSURE METER/CONTROLLER

Provide an electronic solid state proportional Pressure Meter/Controller that will accept a four (4) to twenty (20) mA or a one (1) to five (5) Vdc signal, condition the signal to provide a valid basis for control and then perform ON/OFF or OPEN/CLOSE discrete dry type set point contact conditions based on the input value of the analog input signal. The Pressure Meter/Controller shall have the following features.

- A. Provided with a 3.5-digit LED readout meter in PSI.
- B. Provide six (6) separate setpoints each with discrete, isolated sealed SPDT relay output contacts.
- C. Provide excitation voltage to drive a transducer/transmitter and condition its output signal to provide a continuous display of pressure.
- D. The setpoints shall be field adjustable to operate on rising above or falling below the setpoint.
- E. An LED indicator shall be provided for each setpoint to indicate when it is activated.
- F. The actual setting of each setpoint shall be able to be displayed on the digital readout at any time.
- G. The setting of each setpoint shall be adjustable throughout the complete signal range from the front of the meter/controller.
- H. Provide a means of manually ramping the meter/controller, up and down, throughout its complete signal range, to test the operation of the setpoints.
- I. The meter/controller shall come complete with a four (4) to twenty (20) mA or a one (1) to five (5) Vdc output signal for additional monitoring and control devices.

TAG  
PMC-1

SERVICE  
Hydropneumatic Tank Pressure Meter/Controller

#### 2.4.08 COMMON ALARM LIGHT

Alarm Light shall be RAB catalog number VBR100/GL100PGR or equal. Alarm light enclosure shall be constructed of die cast aluminum with a sturdy mounting bracket. Alarm light shall be suitable for wet location and comply with UL standard 1598, for hazardous locations where the lamp, socket and wiring require protection from rain, corrosive fumes, non-combustible dusts, moisture, non-explosive vapors and gases. The alarm light shall burn dim and steady during normal conditions to indicate electrical power "ON" and lamp good. During any alarm condition, the alarm light shall flash brightly. Alarm light mounted on the side of the enclosure or as directed by the project engineer.

TAG  
AL

SERVICE  
Common Alarm Light



## PART 3 - EXECUTION

### 3.1 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

#### 3.1.01 GENERAL

- A. Ground in accordance with the NEC, as shown on drawings, and as specified herein.
- B. System Grounding:
  - 1. Secondary service neutrals: Ground at the supply side of the secondary disconnecting means and at the related transformers.
  - 2. Separately derived systems (transformers downstream from the service entrance): Ground the secondary neutral.
- C. Equipment Grounding: Metallic structures, including ductwork and building steel, enclosures, raceways, junction boxes, outlet boxes, cabinets, machine frames, and other conductive items in close proximity with electrical circuits, shall be bonded and grounded.

#### 3.1.02 INACCESSIBLE GROUNDING CONNECTIONS

Make grounding connections, which are normally buried or otherwise inaccessible (except connections for which access for periodic testing is required), by exothermic weld.

#### 3.1.03 SECONDARY VOLTAGE EQUIPMENT AND CIRCUITS

- A. Main Bonding Jumper: Bond the secondary service neutral to the ground bus in the service equipment.
- B. Metallic Piping, Building Steel, and Supplemental Electrode(s):
  - 1. Provide a grounding electrode conductor sized per NEC between the service equipment ground bus and all metallic water pipe systems, building steel, and supplemental or made electrodes. Provide jumper insulating joints in the metallic piping. All connections to electrodes shall be made with fittings that conform to UL 467.
  - 2. Provide a supplemental ground electrode and bond to the grounding electrode system.
- C. Service Disconnect (Separate Individual Enclosure): Provide a ground bar bolted to the enclosure with lugs for connecting the various grounding conductors.
- D. Switchgear, Switchboards, Panelboards, Motor Control Centers and Panelboards, Engine-Generators, and Automatic Transfer Switches:
  - 1. Connect the various feeder equipment grounding conductors to the ground bus in the enclosure with suitable pressure connectors.
  - 2. For service entrance equipment, connect the grounding electrode conductor to the ground bus.
  - 3. Provide ground bars, bolted to the housing, with sufficient lugs to terminate the equipment grounding conductors.
  - 4. Connect metallic conduits that terminate without mechanical connection to the housing, by grounding bushings and grounding conductor to the equipment ground bus.

- E. Transformers:
1. Exterior: Exterior transformers supplying interior service equipment shall have the neutral grounded at the transformer secondary. Provide a grounding electrode at the transformer.
  2. Separately derived systems (transformers downstream from service equipment): Ground the secondary neutral at the transformer. Provide a grounding electrode conductor from the transformer to the nearest component of the grounding electrode system **or** to the ground bar at the service equipment.

### 3.1.04 RACEWAY

- A. Conduit Systems:
1. Ground all metallic conduit systems. All metallic conduit systems shall contain an equipment grounding conductor.
  2. Non-metallic conduit systems, except non-metallic feeder conduits that carry a grounded conductor from exterior transformers to interior or building-mounted service entrance equipment, shall contain an equipment grounding conductor.
  3. Conduit that only contains a grounding conductor, and is provided for its mechanical protection, shall be bonded to that conductor at the entrance and exit from the conduit.
  4. Metallic conduits which terminate without mechanical connection to electrical equipment housing by means of locknut and bushings or adapters, shall be provided with grounding bushings. Connect bushings with a bare grounding conductor to the equipment ground bus.
- B. Feeders and Branch Circuits: Install equipment grounding conductors with all feeders and power and lighting branch circuits.
- C. Boxes, Cabinets, Enclosures, and Panelboards:
1. Bond the equipment grounding conductor to each pullbox, junction box, outlet box, device box, cabinets, and other enclosures through which the conductor passes (except for special grounding systems for intensive care units and other critical units shown).
  2. Provide lugs in each box and enclosure for equipment grounding conductor termination.
- D. Wire way Systems:
1. Bond the metallic structures of wireway to provide 100% electrical continuity throughout the wireway system, by connecting a No. 6 AWG [16 mm<sup>2</sup>] bonding jumper at all intermediate metallic enclosures and across all section junctions.
  2. Install insulated No. 6 AWG [16 mm<sup>2</sup>] bonding jumpers between the wireway system, bonded as required above, and the closest building ground at each end and approximately every 50 ft. [16 M].
  3. Use insulated No. 6 AWG [16 mm<sup>2</sup>] bonding jumpers to ground or bond metallic wireway at each end for all intermediate metallic enclosures and across all section junctions.
  4. Use insulated No. 6 AWG [16 mm<sup>2</sup>] bonding jumpers to ground cable tray to column-mounted building ground plates (pads) at each end and approximately every 49 ft. [15 M].
- E. Receptacles shall not be grounded through their mounting screws. Ground receptacles with a jumper from the receptacle green ground terminal to the

device box ground screw and a jumper to the branch circuit equipment grounding conductor.

- F. Ground lighting fixtures to the equipment grounding conductor of the wiring system when the green ground is provided; otherwise, ground the fixtures through the conduit systems. Fixtures connected with flexible conduit shall have a green ground wire included with the power wires from the fixture through the flexible conduit to the first outlet box.
- G. Fixed electrical appliances and equipment shall be provided with a ground lug for termination of the equipment grounding conductor.
- H. Raised Floors: Provide bonding of all raised floor components (if applicable).

### 3.1.05 OUTDOOR METALLIC FENCES AROUND ELECTRICAL EQUIPMENT

Fences shall be grounded with a ground rod at each fixed gate post and at each corner post. Drive ground rods until the top is 12 in [300 mm] below grade. Attach a No. 4 AWG [25 mm<sup>2</sup>] copper conductor by exothermic weld to the ground rods, and extend underground to the immediate vicinity of fence post. Lace the conductor vertically into 12 in [300 mm] of fence mesh and fasten by two approved bronze compression fittings, one to bond the wire to post and the other to bond the wire to fence. Each gate section shall be bonded to its gatepost by a 0.375 in x 1 in [3 mm x 25 mm] flexible, braided copper strap and ground post clamps. Clamps shall be of the anti-electrolysis type.

### 3.1.06 CORROSION INHIBITORS

When making ground and ground bonding connections, apply a corrosion inhibitor to all contact surfaces. Use corrosion inhibitor appropriate for protecting a connection between the metals used.

### 3.1.07 CONDUCTIVE PIPING

- A. Bond all conductive piping systems, interior and exterior, to the grounding electrode system. Bonding connections shall be made as close as practical to the equipment ground bus.
- B. In operating rooms and at intensive care and coronary care type beds, bond the gases and suction piping at the outlets directly to the room or patient ground bus.

### 3.1.08 LIGHTNING PROTECTION SYSTEM

Bond the lightning protection system to the electrical grounding electrode system.

### 3.1.09 ELECTRICAL ROOM GROUNDING

Building Earth Ground Busbars: Provide ground busbar and mounting hardware at each electrical room and connect to pigtail extensions of the building grounding ring.

### 3.1.10 EXTERIOR LIGHT POLES

Provide 20 ft. [6.1 M] of No. 4 bare copper coiled at bottom of pole base excavation prior to pour, plus additional unspliced length in and above foundation as required to reach pole ground stud.

### 3.1.11 GROUND RESISTANCE

- A. Grounding system resistance to ground of 25 ohms or less shall be considered as the **minimum** and a resistance of 5 ohms or less shall be the goal. Make any modifications or additions to the grounding electrode system necessary for compliance without additional cost to the Customer. Final tests shall ensure that this requirement is met.
- B. Resistance of the grounding electrode system shall be measured using a four-terminal fall-of-potential method as defined in IEEE 81. Ground resistance measurements shall be made before the electrical distribution system is energized and shall be made in normally dry conditions not fewer than 48 hours after the last rainfall. Resistance measurements of separate grounding electrode systems shall be made before the systems are bonded together below grade. The combined resistance of separate systems may be used to meet the required resistance, but the specified number of electrodes must still be provided.
- C. Services at power company interface points shall comply with the power company ground resistance requirements.
- D. Below-grade connections shall be visually inspected by the Project Engineer prior to backfilling. The Contractor shall notify the Project Engineer 24 hours before the connections are ready for inspection.

### 3.1.12 GROUND ROD INSTALLATION

- A. For outdoor installations, drive each rod vertically in the earth, until top of rod is 24 in [609 mm] below final grade.
- B. For indoor installations, leave 4 in [100 mm] of rod exposed.
- C. Where permanently concealed ground connections are required, make the connections by the exothermic process, to form solid metal joints. Make accessible ground connections with mechanical pressure-type ground connectors.

Where rock prevents the driving of vertical ground rods, install angled ground rods or grounding electrodes in horizontal trenches to achieve the specified resistance

## 3.2 PROCESS INSTRUMENTATION AND CONTROL

### 3.2.01 ENGINEERING SUPERVISION

- A. The services of a qualified representative of the selected Single Source System Supplier shall be provided to inspect the completed installation, suggest all adjustments necessary to place the system in proper operation, and instruct operating personnel in the care and operation of the equipment furnished. A minimum of one (1) day and one (1) trip start-up service and training operating personnel shall be included. The services shall be furnished by the Contractor as a part of the work included under this section of the specifications.
- B. The System Supplier shall show satisfactory evidence that he maintains, a fully equipped factory organization capable of furnishing adequate service for the equipment furnished, included replacement parts. Suppliers employing outside organizations for "ON CALL" service shall not be considered.

### 3.2.02 GENERAL INSTALLATION

- A. Installation of instrumentation and controls shall be in strict compliance with the manufacturer's instruction. The locations of these items as shown on the Contract Drawings are approximate only. Exact locations shall be as approved by the Engineer during construction. It is the duty of the Contractor to obtain, in the field, all relevant information required for proper placement of instrumentation and controls. In the case of interference with other work, proceed as instructed by the Engineer and provide all materials and labor required to prevent construction delays.
- B. Execution of the installation shall be in full accordance with codes and local rulings. The Contractor shall be responsible for any expenses that are a result of work performed contrary to said codes and regulations.
- C. The System Supplier shall coordinate with the Contractor the installation, the location of process equipment, and connections of process equipment to related equipment panels, subject to the Engineer's approval. The equipment being furnished with electrical controls or instrumentation must be submitted to the System Supplier for approval and coordination with all other control and instrumentation on this project. This engineer will not approve any equipment submittal until this coordination has been accomplished.

### 3.2.03 SPARE PARTS

A one-year supply of manufactures' recommended spare parts shall be provided. The spare parts shall be packaged for long-term storage and shall be protected against humidity and temperature. A spare parts list shall be furnished listing manufacture, device model number, part number and quantity supplied.

### 3.2.04 DELIVERY AND HANDLING

After delivery to the jobsite, the Contractor shall store the control panel off of the ground in a dry location until such time as it is mounted and supplied with electrical service. The contractor shall also insure that the pump power and control cords, as well as control floats, are protected from submergence until they are properly installed and sealed.

### 3.2.05 CONTROL PANEL STAND (when required)

Each control panel stand shall be fabricated per the detail indicated in the plans. Control panel stand legs shall be cemented into the ground a minimum of three feet (3') deep. The control panel shall be bolted at all four corners to the control panel stand with stainless steel hardware. Control panels shall be installed following manufacturer's instructions properly leveled. When installed, the bottom of the control panel shall be approximately four feet (4') above finished grade elevation.

## PART 4 – MEASUREMENT AND PAYMENT

### 4.01 BOOSTER STATION CONTROLS

Booster Station Controls shall be measured on a “lump sum” basis and shall include enclosure, control panel, wiring, contacts, grounding, mounting, uni-strut, bracing and all necessary labor and materials required for a completed and fully functional unit to perform as implied within the plans and specifications.

### 4.02 HYDROPNEUMATIC TANK CONTROLS

Hydropneumatic tank controls will not be measured for separate payment but considered a subsidiary item to hydropneumatic tank.

END OF SECTION

FOR VIEWING ONLY  
NOT FOR BIDDING PURPOSES