Contract Documents

for

Clara Water Association, Inc.

Water System Improvements 2023

ARWAI-G-0770002

New 800 G.P.M. Water Treatment Plant

Waynesboro, MS

August, 2023

Prepared By:

Clearpoint
CONSULTING ENGINEERS, P.A.
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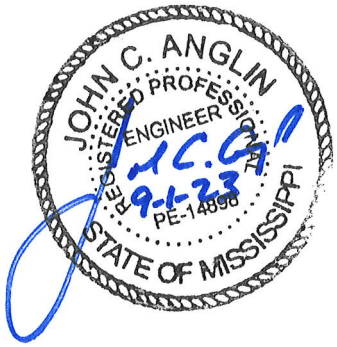

REVISED FOR REBID
2/5/2024

Advertisement for Bids

Sealed Bids for New 800 G.P.M. Water Treatment Plant will be received by **Clara Water Association, Inc.** herein called the "Owner", at the Office of Clara Water Association located at 81 Buckatunna Chicora Clara Rd, Waynesboro, MS 39367 until 10:00 AM, (Local Time) on May 2, 2024, and then at said office publicly opened and read aloud.

The Plans, Specifications, and Contract Documents may be examined at the following locations:

1. Clara Water Association, Inc., 81 Buckatunna Chicora Clara Rd, Waynesboro, MS 39367, 601-735-2428
2. Clearpoint Consulting Engineers, P. A., 6652 U.S. Highway 98, Hattiesburg, MS 39402, 601-261-2609.

The Bid Schedule may be examined at the following locations:

A. Mississippi Procurement Technical Assistance Program (MPTAP)
Mississippi Development Authority, Minority & Small Business Development
Woolfolk Building, 501 North West Street, Suite B 01
Jackson, MS 39201
Contact: Carlyn McGee, 601-359-3448

B. Mississippi Contract Procurement Center (Main Office)
1636 Pops Ferry Road, Suite 229
Biloxi, MS 39532
Contact: Marcia MacDowell, 228-396-1288

Copies of the Contract Documents are available for viewing and obtaining at **www.clearpointbids.com**. Documents are non-refundable and must be purchased through the website to be on the official planholders list. For questions regarding the website, you may contact Plan House at 662-407-0193.

Minority and women's business enterprises are solicited to bid on this contract as prime contractors and are encouraged to make inquiries regarding potential subcontracting opportunities and equipment, material and/or supply needs.

Any contract or contracts awarded under this invitation for bids are expected to be funded in whole or in part by anticipated funds from the ARPA Rural Water Association Infrastructure Grant (RWAIG). Neither the State of Mississippi, the Local Governments and Rural Water Systems Improvements Board, nor any of their employees is or will be a party to this invitation for bids or any resulting or related contracts. This procurement will be subject to all applicable sections of the Mississippi Code of 1972, Annotated, as they apply to local governments, in accordance with RWAIG Program Regulations.

Based on the Assistance Listing: Coronavirus State and Local Fiscal Recovery Funds and Part 2 of the US Treasury State and Local Fiscal Recovery Funds Compliance and Reporting Guidance (v3.0 February 2022) (Compliance Guide), the following Uniform Guidance provisions will be required in all contracts:

- Subpart A, Acronyms and Definitions
- Subpart B, General provisions
- Subpart C, Pre-Federal Award Requirements and Contents of Federal Awards (except 2 CFR 200.204, .205, .210, and .213)
- Subpart D, Post Federal; Award Requirements (except 2 CFR 200.305(b)(8) & (9), .308, .039, and .320(c)(4))
- Subpart E, Cost Principles

- Subpart F, Audit Requirements
- 2 CFR Part 25 (Universal Identifier & System Award Management)
- 2 CFR Part 170 (Reporting Subaward and Executive Compensation Information)
- 2 CFR Part 180 (OMB Guidelines to Agencies on Governmentwide Debarment and Suspension (Non-procurement)
- 2 CFR 200 Appendix ii

Bid preparation will be in accordance with the Instructions to Bidders bound in the Documents.

Advertise On: March 28, 2024 & April 4, 2024

SECTION 00100 INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. Terms used in these Instructions to Bidders which are defined in the General Conditions of the Contract for Construction, AIA Document A201, 2007 Edition, have the meanings assigned to them in the General Conditions. The term "Successful Bidder" means the lowest, qualified, responsible Bidder to whom the OWNER (on the basis of OWNER's evaluation as hereinafter provided) makes an award.

B. Any addenda to the Drawings or Project Manual issued before or during the time of bidding will be included in the proposal and become a part of the Contract.

1.02 BIDDING

A. METHOD OF BIDDING: Project cost will be based on unit prices listed on the proposal form and shall include all labor, materials, equipment, supervision, bailing, shoring removal, overhead, profit, insurance, taxes, fees, etc. to cover the finished work of the several kinds called for on the drawings and specified herein.

1.03 BIDDER'S QUALIFICATIONS:

A. CERTIFICATE OF RESPONSIBILITY NUMBER: Each Contractor submitting a Proposal in excess of $50,000 must show on his proposal and on the face of the envelope containing the proposal, his Certificate of Responsibility Number as required by Section 31-3-1, Mississippi Code of 1972. If a proposal does not exceed $50,000 a notation so stating must appear on the face of the envelope.

B. EVIDENCE: No proposal will be opened, considered or accepted unless the above information is given as specified. Sufficient evidence that said Certificate of Responsibility has been issued and is in effect at the time of receiving proposals must be submitted when required by the Owner or the Professional.

1.04 NON-RESIDENT BIDDER: When a non-resident Bidder (a Contractor whose principal place of business is outside the State of Mississippi) submits a bid for a Mississippi public works project, one of the following is required and shall be submitted with the Proposal Form.

A. Copy of Law: If the non-resident Bidder's state has a resident Bidder preference law, a copy of that law shall be submitted with the Proposal Form.

B. Statement: If the state has no such law then a statement indicating *the State of (Name of State) has no resident Contractor preference law* shall be submitted with the Proposal Form.

1.05 BID SECURITY BID SECURITY: The Bid security shall be in the form of a Bid Bond or a Certified Check.

A. **Bid Bond** – The Bidder must submit a Bid Bond by a Surety licensed in Mississippi, in the amount of five percent (5%) of the bid. The Bid Bond shall be duly executed by the Bidder, the Surety, and Mississippi Resident Agent. (No standard form is required for the Bid Bond. Each Bid Bond must be accompanied by an appropriate Power of Attorney.

B. **Certified Check** – The Bidder may submit a certified check made out to the Owner in the amount of five percent (5%) of the bid. All checks received from Bidders will be returned upon request unless a Bidder is one (1) of the three (3) apparent low Bidders. The three (3) apparent low Bidder's checks will be held for forty-five (45) days, unless a Contract is awarded and executed in less time.

C. If the Successful Bidder fails to execute and deliver the Agreement and furnish the required Contract Security within 10 days of the Notice of Award the Owner may annul the Notice of Award and the Bid Security of that Bidder will be forfeited.

1.06 OPENING OF PROPOSALS

Refer to the Advertisement for Bids.

1.07 PREPARATION OF BID

A. CONDITIONS OF WORK: Each Bidder must fully inform himself of the conditions relating to the construction of the project and employment of labor thereon. Failure to do so will not relieve a Successful Bidder of his obligation to furnish all material and labor necessary to carry out the provisions of his contract. Insofar as possible, the CONTRACTOR must employ methods or means to cause no interruption of or interference with the work of any other CONTRACTOR.

B. EXAMINATION OF SITE: All Bidders shall visit the project site, compare the Drawings and Project Manual with any work in place and inform themselves of all conditions that may in any manner affect cost, progress or performance of the Work. Failure to visit the site will in no way relieve the Successful Bidder from furnishing any materials or performing any work required to complete work in accordance with Drawings and Specifications without additional cost to the OWNER.

C. SITE ACCESS: On request, the OWNER will provide each Bidder access to the site to conduct such investigations and tests as each Bidder deems necessary for submission of his Bid.

D. LAWS AND REGULATIONS: The Bidder's attention is directed to the fact that all applicable state laws, municipal ordinances and the rules and regulations of all authorities having jurisdiction over construction of the project apply to the contract.

E. OBLIGATION OF BIDDER: At the bid opening, each Bidder will be presumed to

have inspected the site, read, and become thoroughly familiar with the drawings and project manual, including all addenda.

F. DISCREPANCIES AND CLARIFICATION: Each Bidder will call to the attention of the Professional any discrepancies in the Contract Documents or questions requiring clarification at least 72 hours before bid. Questions regarding this project will not be answered after this time.

1.08 PROPOSAL

A. FORM: Make all proposals on forms provided and fill all applicable blank spaces without interlineation, alteration, erasure or recapitulation of the work to be done. Forms must be completed in ink or by typewriter. No oral, telegraphic, or telephonic proposals will be considered. Any addenda issued during the bidding will be noted on the proposal form.

B. WITHDRAWAL: Any proposal may be withdrawn prior to the scheduled time for opening of bids or authorized postponement thereof. Any proposal received after the time and date specified will not be considered. Proposals may not be withdrawn until forty-five (45) days after bid opening.

C. SUBMITTAL: Submit bids in duplicate in an opaque sealed envelope marked as follows:

BID FOR:

Clara Water Association, Inc.
ARWAI-G-0770002
New 800 G.P.M. Water Treatment Plant
Waynesboro, MS

Certificate of Responsibility No. ####

D. DIRECTIONS FOR MAILING: To mail his proposal, the Contractor should place his proposal in a sealed envelope as marked above and insert this into a second envelope with the notation “Open immediately, sealed bid enclosed” and mail it to:

Clearpoint Consulting Engineers, PA
Attn: John Anglin
6652 U.S. Highway 98
Hattiesburg, MS 39402

E. PROPOSAL MODIFICATION: A Bidder may modify proposal prior to the scheduled time indicated in the Notice to Bidders. The modification may be written on the outside of the sealed envelope containing the proposal. A facsimile (fax) will not be acceptable.

1.09 OPENING AND CONTRACT

A. OPENING OF PROPOSALS: Proposals will be publicly opened and read shortly after the time stated in the Notice to Bidders or advertisement. Bidder representatives are invited; however, attendance is not mandatory. A written summary of the results will be supplied to each Bidder.

B. IRREGULARITIES: The omission of any information requested on the Proposal Form may be considered as an informality, or irregularity, by the awarding body when in their opinion the omitted information does not alter the amounts contained in the submitted proposal, or place other Bidders at a disadvantage.

C. PROTEST: Any protest must be delivered in writing to the Owner within twenty-four (24) hours after the bid opening.

D. ERRORS: Any claim of error and request for release from bid must be delivered in writing to the Owner within twenty-four (24) hours after the bid opening. The Bidder shall provide sufficient documentation with the written request clearly proving an error was made.

E. Discrepancies between words and figures will be resolved in favor of words. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

F. AWARD OF CONTRACT: The Owner reserves the right to waive irregularities and to reject any or all bids. A Contract will be awarded on the basis of the low base bid or low combination of base bid and those alternates selected by the owner in any order determined to be in the best interest of the Owner and which produces a total within available funds.

G. DISQUALIFICATION OF BIDDER: A Bidder may be disqualified for any of the following reasons:

1. Failure to comply with the bid requirements
2. Bidder being in arrears on an existing contract with the Owner
3. Bidder being in or anticipates being in litigation or arbitration with the Owner
4. Bidder having defaulted on a previous contract.

H. SECURITY FOR FAITHFUL PERFORMANCE: Simultaneously with his delivery of the executed contract, the Contractor will furnish a Surety Bond or Bonds as security for the faithful performance of this contract and for the payment of all persons performing labor on the project under this contract. The surety on such bond or bonds will be by a duly authorized Surety Company satisfactory to the Owner.

I. TIME OF COMPLETION: The bidder agrees to complete the work in **540 calendar days**.

J. FAILURE TO ENTER INTO CONTRACT: The successful bidder, upon his failure or refusal to execute and deliver the contract, contract bonds, and Certificate of Insurance required herein within ten (10) working days after he has received notice of acceptance of his proposal, will forfeit to the Owner as liquidated damages the bid security deposited with his proposal.

K. LIQUIDATED DAMAGES: In the event that substantial completion is not approved within the time frame established herein, liquidated damages will be assessed in the amount of two hundred dollars ($200.00) for each calendar day until substantial completion is approved by the Owner.

L. OWNER may conduct such investigations as he deems necessary to assist in the evaluation of any proposal and to establish the responsibility, qualifications and financial ability of the Bidders, proposed Subcontractors and other persons and organizations to do the Work in accordance with the Contract Documents to OWNER's satisfaction within the prescribed time.

M. OWNER reserves the right to reject the proposal of any Bidder who does not pass any such evaluation to OWNER's satisfaction.

N. If the contract is to be awarded, OWNER will give the Successful Bidder a Notice of Award within sixty (60) days after the day of the Bid opening. All proposals shall remain valid for the same period of sixty (60) days.

O. Minority Business and Women's Business Utilization Requirements: While there are no associated goals, bidders are encouraged to make positive efforts to utilize minority-owned and women-owned businesses as sources of construction, materials, supplies, and services. Such efforts should allow these sources the maximum feasible opportunity to compete for sub-agreements and contracts. Documentation of outreach efforts may be required to be submitted.

END OF SECTION 00100

CERTIFICATION BY PROPOSED PRIME OR SUBCONTRACTOR REGARDING EQUAL EMPLOYMENT OPPORTUNITY

Project Number_____

INSTRUCTIONS

This certification is required pursuant to Executive Order 11246, Part II, Section 203(b), (30 F.R. 12319-25). Any bidder or prospective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clauses; and, if so, whether it has filed all compliance reports due under applicable instructions. Where this certification indicates that the prime or subcontractor has not filed a compliance report due under applicable instruction, such contractor shall be required to submit a compliance report.

THIS FORM, ALONG WITH ITEMS LISTED IN SPECIAL NOTICE #1, IS TO BE SUBMITTED BY LOW BIDDER AND PROPOSED SUBCONTRACTORS WITH A PROCUREMENT VALUE OVER $10,000 TO THE OWNER TEN (10) DAYS AFTER BID OPENING.

Prime or Subcontractor's Name: _____

Address: _____

_____

1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause. YES _____ NO _____

2. Compliance Reports were required to be filed in connection with such contract or subcontract. YES _____ NO _____

   If YES, state what reports were filed and with what agency.

3. Bidder has filed all compliance reports due under applicable instructions YES_____NO_____

4. If answer to item 3 is NO, please explain in detail on reverse side of this certification. The information above is true and complete to the best of my knowledge and belief. (A willfully false statement is punishable by law - U.S. Code, Title 18, Section 1001.)

_____
NAME AND TITLE OF SIGNER (PLEASE TYPE)

_____ _____
SIGNATURE DATE

CERTIFICATION REGARDING DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS

Under Executive Order 12549 individuals or organizations debarred from participation in Federal Assistance Programs may not receive an assistance award under a federal program or subagreement thereunder for $25,000 or more. Accordingly, each recipient of an American Rescue Plan Act Rural Water Infrastructure Grant or a contract (engineering or construction) awarded under a loan must complete the following certification (see 40 CFR 32.510).

The grant recipient must obtain this certification from all contractors (prime construction contractor and subcontractors/equipment/material suppliers). The Department will not approve the award of a contract for ARPA RWAIG participation until the grant recipient certifies that certification has been obtained from the successful bidder and his sub-contractors. Prime and subcontractor/equipment/material suppliers' certifications must be included with the executed contract documents submittal to the Department.

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

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency

(b) Have not within a three year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property

(c) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (b) of this certification, and

(d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

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

_____

Prime or Subcontractor's Name Signature/Date

( ) I am unable to certify the above statements. Attached is my explanation.

BIDDER agrees to perform all the work described in the CONTRACT DOCUMENTS for the following unit prices or lump sum:

Clara Water Association, Inc.
Water System Improvements - 2023
ARWAI-G-0770002
New 800 G.P.M. Water Treatment Plant
Waynesboro, MS

Proposal of: _____

_____

_____

To Whom it Concerns:

The undersigned bidder has carefully examined the specifications captioned above, and having ascertained actual conditions at the site of the work, hereby proposes to furnish all labor, tools, materials, and supplies necessary to complete the satisfactory construction of said project for the unit prices indicated on the schedule below and within the time set forth therein:

BID SCHEDULE
New 800 G.P.M. Water Treatment Plant
Clara Water Association

NO.	ITEM	UNIT	UNIT PRICE	PLAN QUANTITY	TOTAL PRICE
1	Mobilization	Lump Sum	_____	1	$_____
2	PH Adjustment Water Treatment Plant	Lump Sum	_____	1	$_____
3	Iron Removal Water Treatment Plant	Lump Sum	_____	1	$_____
4	10” CL 200 PVC	Linear Feet	_____	400	$_____
5	10” Gate Valve	Per Each	_____	4	$_____
6	8” CL 200 PVC Drain Line	Linear Feet	_____	200	$_____
7	Connection To Existing Water Main	Per Each	_____	2	$_____
8	Electrical Controls	Lump Sum	_____	1	$_____

9	Automatic Transfer Switch	Lump Sum	_____	1	$_____
10	Ductile Iron Fittings	Per Pound	_____	5000	$_____
11	16" PVC Drainage Pipe	Linear Feet	_____	250	$_____
12	Detention Pond (Earthen)	Lump Sum	_____	1	$_____
13	48" Precast Manhole	Per Each	_____	1	$_____
14	Earthwork	Lump Sum	_____	1	$_____

TOTAL OF BASE BID…….$_____DOLLARS

Additive Alternate #1:

15	610 Crushed Stone	Per Ton	_____	50	$_____

Deductive Alternate #1:

16	600 GPM Aerator in Lieu of 800 GPM Aerator	Lump Sum	_____	1	$_____

Deductive Alternate #2:

17	600 GPM Service Pumps in Lieu of 800 GPM Service Pumps	Lump Sum	_____	1	$_____

Deductive Alternate #4:

18	Remove One (1) Pressure Filter, Foundation, Piping, and Appurtenances	Lump Sum	_____	1	$_____

Deductive Alternate #5:

19	28,000 Gallon Clearwell in Lieu of 34,000 Gallon Clearwell	Lump Sum	_____	1	$_____

The undersigned bidder understands that the quantities mentioned above are approximate only and are

subject to either increase or decrease, and hereby propose to perform any increased or decreased quantities of work at the unit prices bid for each item.

The undersigned bidder understands that all work for which no pay items are provided in the proposal will not be paid for directly and compensation therefore shall be considered included in the prices and payment for other bid items.

CONSTRUCTION TIME: The undersigned bidder agrees to complete the work in **540 Calendar Days** from the date of a "Notice to Proceed" issued by the Engineer.

LIQUIDATED DAMAGES: In the event that substantial completion is not approved within the time frame established herein, liquidated damages will be assessed in the amount of two hundred dollars ($200.00) for each day until substantial completion is approved by the Owner.

BID SECURITY: Bid Security in the form of a Bid Bond or Certified Check is attached hereto in the amount of five percent (5%) of the Bid.

ADDENDA ACKNOWLEDGMENT: The undersigned bidder acknowledges receipt of the following addenda:

Addendum No. 1 dated _____

Addendum No. 2 dated _____

Addendum No. 3 dated _____

Respectfully submitted:

_____	_____
Signature	Company
_____	_____
Title	Address
_____	_____
Certificate of Responsibility	Date

(SEAL - if BID is by a corporation) Attest

***NOTE: Bid shall include sales tax and all other applicable taxes and fees.**

END OF SECTION 00200

NON-COLLUSION AFFIDAVIT

(This affidavit must be executed for the Bid to be considered)

STATE OF MISSISSIPPI)
COUNTY OF_____) ss.

_____ being first duly sworn,
(Person)

deposes and says that he is _____
(Sole owner, a partner, president, secretary, etc.)

of _____ the party making the
(Name of Firm)

foregoing Proposal or Bid; that such Bid is genuine and not collusive; that said Bidder is not financially interested in, or otherwise affiliated in a business way with any other bidder on the same contract; that said Bidder has not colluded, conspired, connived, or agreed, directly or indirectly, with any bidder or person, to put in a sham bid, or that such other person shall refrain from bidding, and has not in any manner, directly or indirectly sought by agreement or collusion, or communication or conference, with any person, to fix the bid price of affiant or any other bidder, or to fix any overhead, profit or cost element of said bid price, or of that of any other bidder, or to secure any advantage against the Owner, or any person or persons interested in the proposed contract; and that all statements contained in said Proposal or Bid are true; and further, that such Bidder has not, directly or indirectly submitted his Bid, or the contents thereof, or divulged information or data relative thereto to any association or to any member or agent thereof.

_____
Affiant

Sworn to and subscribed before me this _____ day of _____, 20_____.

_____
Notary Public in and for

_____ County,
Mississippi

(SEAL) My Commission Expires

_____, 20_____

SECTION 00230 BID BOND

KNOW ALL MEN BY THESE PRESENT, that we, the undersigned_____ as principal, and _____ as Surety, are hereby held and firmly bound unto the Clara Water Association, Inc., as Owner, in the penal sum of _____ for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns. Signed this _____ day of _____, 20_____.

The condition of the above obligation is such that whereas the Principal has submitted to the Clara Water Association, Inc. a certain bid, attached hereto and hereby made a part hereof to enter into a contract in writing for Water System Improvements, New 800 G.P.M. Water Treatment Plant, ARWAI-G-0770002, Waynesboro, MS.

NOW THEREFORE,

(a) If said Bid shall be rejected, or in the alternate,

(b) If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said Bid) and shall furnish a bond for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Bid,

then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

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

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

_____
Contractor

SEAL By:_____

_____
Surety

SEAL By:_____

END OF SECTION 00230

SECTION 00250 NOTICE OF AWARD

Date: _____

To: _____

_____

_____

RE: Clara Water Association, Inc.
New 800 G.P.M. Water Treatment Plant
ARWAI-G-0770002
Waynesboro, MS

To Whom It Concerns:

Clara Water Association, Inc. has accepted your proposal in the amount of $ _____. You are required by the Instructions to Bidders to execute the Agreement and furnish to Clara Water Association, Inc., the required Contractor's Performance Bond, Payment Bond and/or certificates of insurance within ten (10) calendar days from the date of delivery of this Notice to you. Please return all five (5) copies of the necessary contracts and bonds to the office of Clearpoint Consulting Engineers, P.A., 6652 U.S. Highway 98, Hattiesburg, Mississippi 39402.

If you fail to execute said Agreement and to furnish said Bonds within ten (10) days from the date of delivery of this Notice, the Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your proposal as abandoned and as a forfeiture of your Bid Bond. The Owner will be entitled to such other rights as may be granted by Law.

You are required to return an acknowledged copy of this Notice of Award directly to Clearpoint Consulting Engineers, P.A.

Sincerely,

Clearpoint Consulting Engineers, P.A.

c: Clara Water Association, Inc.

ACCEPTANCE OF NOTICE

Receipt of the above Notice of Award is hereby acknowledged by _____ this the

_____ day of _____, 20___.

By: _____

Title: _____

END OF SECTION 00250

SECTION 00500 AGREEMENT FORM

This Agreement made the _____ day _____between the Owner:

Clara Water Association, Inc.
81 Buckatunna Chicora Clara Rd
Waynesboro, MS 39367

and the Contractor:

Business Name: _____

Address: _____

City/State/Zip: _____

The Contractor is doing business as a _____
(Corporation, Partnership, or Individual)

The Contractor's taxpayer identification number is _____.

THE PROJECT IS: Clara Water Association, Inc.
New 800 G.P.M. Water Treatment Plant
ARWAI-G-0770002
Waynesboro, MS

THE PROFESSIONAL FOR THE PROJECT IS:

Clearpoint Consulting Engineers, P.A.
6652 U.S. Highway 98
Hattiesburg, MS 39402

THIS AGREEMENT entered into as of the day and year first written above:

OWNER: Clara Water Association, Inc. CONTRACTOR: _____.

By: _____ By: _____
Signature Signature

Name/Title: _____ Name/Title: _____

THE OWNER AND THE CONTRACTOR AGREE AS SET FORTH IN ARTICLES ONE THROUGH SIX, ON THE FOLLOWING PAGES:

ARTICLE 1: WORK AND CONTRACT DOCUMENTS

1.01 THE WORK

A. The CONTRACTOR will perform all the work required by the Contract Documents for the project indicated above.

1.02 THE CONTRACT DOCUMENTS

A. The Contract Documents, which constitute the entire agreement between the OWNER and CONTRACTOR, are enumerated as follows:

B. Project Manual dated August 2023

Notice to Contractors
Instructions to Bidders
Proposal Form
Bid Bond
Notice of Award
Agreement
Performance and Payment Bonds
Partnership Certificate
Notice to Proceed
Change Order Form
Certificate of Insurance
General Conditions
Supplementary Conditions
Supplemental General Conditions
Technical Specifications

C. Addenda

Addendum No. 1, dated _____
Addendum No. 2, dated _____
Addendum No. 3, dated _____

D. Drawings as follows:

Sheets No. _____

E. Other Documents: _____
_____
_____

ARTICLE 2 - CONTRACT SUM

2.01 CONTRACT SUM

A. The OWNER will pay the CONTRACTOR in current funds for the performance of the work, subject to additions and deductions by change order as provided in the contract documents, the contract sum of _____. The contract sum is based upon the lump sum price listed on the proposal form unless adjusted by approved contract change orders.

ARTICLE 3 - CONTRACT TIME

3.01 TIME

A. The work to be performed under this contract shall be commenced upon the date stated in the "Notice to Proceed". The work is to be substantially complete, subject to approved change orders, within **540 calendar days**.

ARTICLE 4 - LIQUIDATED DAMAGES AND BONUSES

4.01 LIQUIDATED DAMAGES

A. The OWNER and the CONTRACTOR recognize that time is of the essence in this Agreement and that the OWNER will suffer financial loss if the work is not substantially complete within the time specified in Article 3 above, plus any extensions thereof by duly authorized Contract Amendments. They also recognize the delays, expense and difficulties involved in proving in a legal arbitration proceeding the actual loss suffered by the OWNER if the work is not substantially complete on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) CONTRACTOR shall pay OWNER the sum of two hundred dollars ($200.00) for each day that expires after the time specified in Article 3 above for substantial completion until the work is substantially complete.

ARTICLE 5 - PROGRESS AND FINAL PAYMENTS

5.01 PROGRESS PAYMENTS

A. Based upon Applications for Payment submitted to the PROFESSIONAL by the CONTRACTOR and Certificates for Payment issued by the PROFESSIONAL, the OWNER will make progress payments on account of the contract sum to the CONTRACTOR as provided in the contract documents.

5.02 FINAL PAYMENT

A. Final payment constituting the entire balance of the contract sum will be paid by the OWNER to the CONTRACTOR when the work has been completed, the contract fully performed and a final Certificate for Payment has been issued by the PROFESSIONAL.

ARTICLE 6 - MISCELLANEOUS PROVISIONS

6.01 Terms used in this agreement which are defined in the conditions of the contract will have the meanings designated in those conditions.

6.02 The CONTRACTOR will not assign, sublet or transfer his interest in this contract agreement without the written consent of the OWNER. The OWNER and CONTRACTOR hereby agree to the full performance of the covenants contained herein.

END OF SECTION 00500

SECTION 0060 PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

that _____
(Name of Contractor)

_____
(Address of Contractor)

a _____, hereinafter call Principal, and
(Corporation, Partnership, or Individual)

_____
(Name of Surety)

_____
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto
Clara Water Association, Inc.
(Name of Owner)
81 Buckatunna Chicora Clara Rd, Waynesboro, MS 39367
(Address of Owner)

hereinafter called OWNER, in the penal sum of

_____ Dollars, ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated _____ day of _____, 2023, a copy of which is hereto attached and made a part hereof for the construction of:

New 800 G.P.M. Water Treatment Plant, ARWAI-G-0770002, Waynesboro, MS

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

NOW, THEREFORE, if the Principal shall promptly make payment of all taxes, licenses, assignments, contributions, damages, penalties, and interest thereon, when and as the same may lawfully be due the State of Mississippi, or any county, municipality, board, department, commission, or political subdivision thereof, by reason of and directly connected with the performance of said Contract or any part thereof as provided by Sections 27-65-1, 27-65-21, 27-67-301 and 31-5-3, supra, or any other applicable statute or other authority, then this obligation shall be null and void; otherwise, it shall remain in full force and effect.

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

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

IN WITNESS WHEREOF, this statement is executed in 5
(Number)

counterparts, each one of which shall be deemed an original, this the ____ day of _____, 2023.

ATTEST:

_____
(Principal) Secretary

_____
Principal

(SEAL)

By_____(s)

_____
(Address)

_____
Witness as to Principal

_____
(Address)

_____
Surety

ATTEST:

By_____
Attorney-in-Fact

_____
Witness as to Surety

_____
(Address)

_____
(Address)

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

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the PROJECT is located.

SECTION 00600 PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS THAT

_____ (Name of Contractor)

_____
(Address of Contractor)

a _____, hereinafter called Principal, and
(Corporation, Partnership, or Individual)

_____
(Name of Surety)

_____
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto
Clara Water Association, Inc.
(Name of Owner)
81 Buckatunna Chicora Clara Rd, Waynesboro, MS 39367
(
Address of Owner)

hereinafter called OWNER, in the penal sum of

_____ Dollars, ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated _____ day of _____, 2023, a copy of which is hereto attached and made a part hereof for the construction of:

New 800 G.P.M. Water Treatment Plant, ARWAI-G-0770002, Waynesboro, MS

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

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

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

IN WITNESS WHEREOF, this statement is executed in 5

(Number)

counterparts, each one of which shall be deemed an original, this the ____ day of _____, 2023.

ATTEST:

_____
(Principal) Secretary

_____
Principal

(SEAL) By_____(s)

_____
(Address)

_____

_____
Witness as to Principal

(Address)

_____

_____
Surety

ATTEST: By_____

_____

Attorney-in-Fact

_____
Witness as to Surety

_____
(Address)

_____
(Address)

_____

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

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the PROJECT is located.

END OF SECTION 00600

SECTION 00610 PARTNERSHIP CERTIFICATE

Clara Water Association, Inc.
New 800 G.P.M. Water Treatment Plant
ARWAI-G-0770002
Waynesboro, MS

PARTNERSHIP CERTIFICATE

STATE OF _____

COUNTY OF _____

On this _____ day of _____, 20____, before me personally appeared known to me and known by me to be the person who executed the above instrument, who being by me first duly sworn, did depose and say that he is a general partner in the firm of ; that said firm consists of himself and _____; and that he executed the foregoing instrument on behalf of said firm for the uses and purposes stated herein.

_____
Notary Public in the

County of _____

State of _____

Notarial Seal

My Commission Expires:

----------OR----------

CORPORATE CERTIFICATE

I, _____, certify that I am the Secretary of the Corporation named as Contractor in the foregoing Contract; that _____, who signed said Contract on behalf of the Contractor was then _____ of said Corporation; that said Contract was duly signed for and in behalf of said Corporation by authority of its governing body and is within the scope of its corporate powers.

_____
Secretary

Corporate Seal

END OF SECTION 00610

SECTION 00630 NOTICE TO PROCEED

Date: _____

To: _____

_____

_____

Attention:

Re: NOTICE TO PROCEED
Clara Water Association, Inc.
New 800 G.P.M. Water Treatment Plant
ARWAI-G-0770002
Waynesboro, MS

Dear Sirs:

You are hereby notified to commence work in accordance with the Contract dated _____on or before _____. You are to complete the work within 540 calendar days. Liquidated damages in the amount of two hundred dollars ($200.00) per calendar day for each day the Work remains incomplete after will be imposed unless the contract time is otherwise adjusted for due cause by change orders to the Contract.

The engineering firm Clearpoint Consulting Engineers, P.A. will act as the Professional on behalf of Clara Water Association, Inc. for the work to be performed under the contract.

Please return a copy of this NOTICE TO PROCEED to the undersigned indicating your receipt of this document in the space provided below.

Sincerely,

Clearpoint Consulting Engineers, P.A.

c: Clara Water Association, Inc.

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED

is hereby acknowledged by _____ this _____ day of _____, 20__.

By: _____

Title: _____

END OF SECTION 00630

MISSISSIPPI RURAL WATER INFRASTRUCTURE GRANT PROGRAM
CONSTRUCTION CONTRACT MODIFICATION

Contract Mod. No.: _____ Date: _____ Grant No: _____
Name of Project: _____

Owner _____
Contractor _____
Agreement Date: _____ Contract Time: _____
Contract Start Date: _____ Original Completion Date: _____
Contract Time (Increased) (Decreased) By: _____ Calendar Days
Revised Contract Completion Date: _____

BREAKDOWN OF PROPOSED MODIFICATION (see attached letter from Contractor dated??/??/??).

Item No.	Item Description	Item Unit	Unit Pric	Contract Quantity	Revised Contract Quantity	Change Order Quantity	Change Order Amount	Contract Amount

STATEMENT OF JUSTIFICATION:

SEE ATTACHMENT A for detailed breakdown on line items.

Total Change - (Increase) (Decrease)	$ -		
Original Contract Amount		Original Contract Time	
Contract Amount Revised by Previous CM		Total Change	
Revised Contract Amount	$ -	Revised Contract Time	0

Requested By:
_____ Title: _____ Date: _____
Authorized Representative

Recommended By:
_____ Title: _____ Date: _____
Final Design Engineer

Accepted By:
_____ Title: _____ Date: _____
Contractor

PART 1 - GENERAL

1.01 CERTIFICATE OF INSURANCE

A. Prior to the beginning of Work, the CONTRACTOR shall furnish insurance certificates as required in Article 11 of the Supplementary Conditions. The Insurance Certificates provided by the CONTRACTOR will be inserted in this Section of the executed Contract.

END OF SECTION 00650

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope: The "General Conditions of the Contract for Construction", AIA Document A201, 2007 SP, Articles 1 through 15 as printed hereafter are a part of this contract.

AIA® Document A201® – 2007 SP

General Conditions of the Contract for Construction, for use on a Sustainable Project

for the following PROJECT:

New 800 G.P.M. Water Treatment Plant

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

THE OWNER:

Clara Water Association, Inc.

THE ARCHITECT: (ENGINEER)

Clearpoint Consulting Engineers, P.A.

TABLE OF ARTICLES

Init.

INDEX

(Topics and numbers in bold are section headings.)

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, the Sustainability Plan, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.1.9 Special Definitions

§ 1.1.9.1 Sustainable Objective

The Sustainable Objective is the Owner's goal of incorporating Sustainable Measures into the design, construction, maintenance and operations of the Project to achieve a Sustainability Certification or other benefit to the environment, to enhance the health and well-being of building occupants, or to improve energy efficiency. The Sustainable Objective is identified in the Sustainability Plan.

§ 1.1.9.2 Sustainable Measure
A Sustainable Measure is a specific design or construction element, or post occupancy use, operation, maintenance or monitoring requirement that must be completed in order to achieve the Sustainable Objective. The Owner, Architect and Contractor shall each have responsibility for the Sustainable Measure(s) allocated to them in the Sustainability Plan.

§ 1.1.9.3 Sustainability Plan
The Sustainability Plan is a Contract Document that identifies and describes: the Sustainable Objective; the targeted Sustainable Measures; implementation strategies selected to achieve the Sustainable Measures; the Owner's, Architect's and Contractor's roles and responsibilities associated with achieving the Sustainable Measures; the specific details about design reviews, testing or metrics to verify achievement of each Sustainable Measure; and the Sustainability Documentation required for the Project.

§ 1.1.9.4 Sustainability Certification
The Sustainability Certification is the initial third-party certification of sustainable design, construction, or environmental or energy performance, such as LEED®, Green Globes™, Energy Star or another rating or certification system, that may be designated as the Sustainable Objective or part of the Sustainable Objective for the Project. The term Sustainability Certification shall not apply to any recertification or certification occurring subsequent to the initial certification.

§ 1.1.9.5 Sustainability Documentation
The Sustainability Documentation includes all documentation related to the Sustainable Objective or to a specific Sustainable Measure that the Owner, Architect or Contractor is required to prepare in accordance with the Contract Documents. Responsibility for preparation of specific portions of the Sustainability Documentation will be allocated among the Owner, Architect and Contractor in the Sustainability Plan and may include documentation required by the Certifying Authority.

§ 1.1.9.6 Certifying Authority
The Certifying Authority is the entity that establishes criteria for achievement of a Sustainability Certification and is authorized to grant or deny a Sustainability Certification.

§ 1.2 Correlation and Intent of the Contract Documents
§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization
Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation
In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications and Other Instruments of Service
§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official

regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

§ 1.6 Transmission of Data in Digital Form

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Information and Services Required of the Owner

§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.2.3 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.2.6 The Owner shall perform those Sustainable Measures identified as the responsibility of the Owner in the Sustainability Plan, including any approved changes, or as otherwise required by the Contract Documents. The Owner

shall require that each of its contractors and consultants perform the services or work assigned to them in accordance with the Sustainability Plan.

§ 2.2.7 The Owner shall comply with the requirements of the Certifying Authority as they relate to the ownership, operation and maintenance of the Project both during construction and after completion of the Project.

§ 2.3 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.4 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents, including any Sustainable Measures identified as the responsibility of the Contractor in the Sustainability Plan.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.2.1 The Contractor shall meet with the Owner and Architect to discuss alternatives in the event the Owner or Architect recognizes a condition that will affect achievement of a Sustainable Measure or achievement of the Sustainable Objective. If any condition is discovered by, or made known to, the Contractor that will adversely affect the Contractor's achievement of a Sustainable Measure for which the Contractor is responsible pursuant to the

Sustainability Plan, the Contractor will promptly provide notice to the Architect and meet with the Owner and Architect to discuss alternatives to remedy the condition.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, or requirements of the Certifying Authority, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.2.1 The Contractor shall include, with any request for substitution, a written representation identifying any potential effect the substitution may have on the Project's achievement of a Sustainable Measure or the Sustainable Objective. The Owner and Architect shall be entitled to rely on any such representation. In preparing this representation, the Contractor may request additional information from the Architect describing how the product, material or equipment, for which a substitution is proposed, was intended to satisfy the requirements of a Sustainable Measure or contribute toward achievement of the Sustainable Objective. The Architect shall respond to the Contractor's request in accordance with Section 4.2.14.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 The Contractor shall perform the Sustainable Measures required to be performed by the Contractor in accordance with the Contract Documents; however, nothing contained in this Section 3.5 shall be construed as a guarantee or warranty by the Contractor that the Project will achieve the Sustainable Objective.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect's approval. The Architect's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site and Sustainability Documentation

§ 3.11.1 The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.11.2 The Contractor shall be responsible for preparing and completing the Sustainability Documentation required from the Contractor by the Contract Documents, including any Sustainability Documentation required to be submitted

after Substantial Completion. The Contractor shall submit the Sustainability Documentation to the Architect in accordance with any schedules or deadlines set forth in, or as otherwise required by, the Contract Documents. In the absence of schedules or deadlines for submission of Sustainability Documentation in the Contract Documents, the Contractor will submit the Sustainability Documentation with reasonable promptness so that the Architect may submit the Sustainability Documentation to the Certifying Authority.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and

other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.12.10.1 In the event the Contractor's design professional proposes the use of materials or equipment that have had limited testing or verification of performance, the Contractor shall discuss with the Architect and Owner the proposed use of such materials or equipment and potential effects on the Sustainable Objective that may occur if the materials or equipment fail to perform in accordance with the manufacturer's or supplier's representations. The Owner will render a written decision regarding the use of such materials or equipment in a timely manner. In the event the Owner elects to proceed with the use of such materials or equipment, the Contractor and Architect shall be permitted to rely on the manufacturer's or supplier's representations and shall not be responsible for any damages arising from the failure of the material or equipment to perform in accordance with the manufacturer's or supplier's representations.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project. The Contractor shall also recycle, reuse, remove or dispose of materials as required by the Contract Documents.

§ 3.15.2 The Contractor, in accordance with the Contract Documents, shall prepare and submit to the Architect and Owner a construction waste management and disposal plan setting forth the procedures and processes for salvaging, recycling or disposing of construction waste generated from the Project.

§ 3.15.3 If the Contractor fails to clean up in accordance with Section 3.15.1 and as provided in the Contract Documents, the Owner may do so and Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the Contractor has reason to believe

that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Owner shall retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 4.1.2 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

§ 4.1.3 If the employment of the Architect is terminated, the Owner shall employ a successor architect as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work, including those that will impact the Contractor's achievement of its Sustainable Measures. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications Facilitating Contract Administration
Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4. If the Architect determines that implementation of a proposed change would materially impact a Sustainable Measure or the Sustainable Objective, the Architect shall notify the Owner, who may authorize further investigation of such change. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties, Sustainability Documentation and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. Failure of the Owner or Architect to reply within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, including the Sustainability Plan and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be

responsible to the Contractor for costs the Contractor incurs because of a separate contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:

- **.1** The change in the Work;
- **.2** The amount of the adjustment, if any, in the Contract Sum; and
- **.3** The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- **.1** Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- **.2** Unit prices stated in the Contract Documents or subsequently agreed upon;
- **.3** Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- **.4** As provided in Section 7.3.7.

§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

.1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;

.2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and

.5 Additional costs of supervision and field office personnel directly attributable to the change.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control; or by delay authorized by the Owner pending mediation and arbitration; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Architect, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment

or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data comprising the Application for Payment, that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- **.1** defective Work not remedied;
- **.2** third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
- **.3** failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
- **.4** reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- **.5** damage to the Owner or a separate contractor;
- **.6** reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- **.7** repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.3 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Architect will reflect such payment on the next Certificate for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

§ 9.6.5 Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. Except for that portion of the Sustainability Documentation which by its nature must be provided after Substantial Completion, the Contractor shall submit all other Sustainability Documentation required from the Contractor by the Contract Documents no later than the date of Substantial Completion. Verification that the Project has achieved the Sustainable Objective, or the actual achievement of the Sustainable Objective, shall not be a condition precedent to issuance of a Certificate of Substantial Completion in accordance with Section 9.8.4.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled. Verification that the Project has achieved the Sustainable Objective, or the actual achievement of the Sustainable Objective, shall not be a condition precedent to issuance of the final Certificate for Payment.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) all Sustainability Documentation required from the Contractor by the Contract Documents, (5) consent

of surety, if any, to final payment and (6), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- **.1** liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents; or
- **.3** terms of special warranties required by the Contract Documents.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to

- **.1** employees on the Work and other persons who may be affected thereby;
- **.2** the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and
- **.3** other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect or

anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property
If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials
§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Liability Insurance

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- **.1** Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
- **.2** Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- **.3** Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
- **.4** Claims for damages insured by usual personal injury liability coverage;
- **.5** Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- **.6** Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
- **.7** Claims for bodily injury or property damage arising out of completed operations; and
- **.8** Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

§ 11.2 Owner's Liability Insurance

The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

§ 11.3 Property Insurance

§ 11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract

Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

§ 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.

§ 11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ 11.3.2 Boiler and Machinery Insurance

The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

§ 11.3.3 Loss of Use Insurance

The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

§ 11.3.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that

the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

§ 11.3.7 Waivers of Subrogation

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 11.3.8 A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

§ 11.4 Performance Bond and Payment Bond

§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

§ 11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of

correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 Correction of Work

§ 12.2.1 Before or After Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If

either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

§ 13.3 Written Notice

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 13.4 Rights and Remedies

§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 13.4.2 No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.

§ 13.5 Tests and Inspections

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect's services and expenses shall be at the Contractor's expense.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.5.5 If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.6 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

§ 13.7 Time Limits on Claims

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;

.2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;

.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or

.4 The Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;

.2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;

.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or

.4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- **.1** that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or
- **.2** that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- **.1** cease operations as directed by the Owner in the notice;
- **.2** take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- **.3** except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 Notice of Claims

Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3 Continuing Contract Performance

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

§ 15.1.4 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.5 Claims for Additional Time

§ 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

§ 15.1.6 Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons;

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work; and

.3 damages resulting from failure of the Project to achieve the Sustainable Objective or one or more of the Sustainable Measures including unachieved energy savings, unintended operational expenses, lost financial or tax incentives, or unachieved gains in worker productivity.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.

SECTION 00800 SUPPLEMENTARY CONDITIONS

PART 1 - GENERAL

1.01 **DESCRIPTION**

A. Owner: These supplements are necessary because the Owner is an agency, or political subdivision, of the State of Mississippi and occupies a different position from that of the usual Owner.

B. Document: The following supplements modify, change, delete from, or add to the General Conditions of the Contract, AIA Document A201, Sixteenth Edition, 2007. When an Article of the General Conditions is modified, or deleted, by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph, or Clause will remain in effect.

ARTICLE 1 - GENERAL PROVISIONS

1.1 **BASIC DEFINITIONS**

1.1.1 The Contract Documents: Delete the last sentence of this Subparagraph and substitute the following sentence:

The Contract Documents include the Advertisement for Bids, Instructions to Bidders, Proposal Form, sample forms and all portions of addenda issued prior to execution of the Contract.

1.5 **OWNERSHIP AND USE OF ARCHITECT'S DRAWINGS, SPECIFICATIONS AND OTHER DOCUMENTS**

1.5.1 Add a new sentence at the end of this Subparagraph:

This Paragraph in no way supersedes the Owner's document rights set forth in the Agreement Between the Owner and the Professional.

ARTICLE 2 - OWNER

2.1 **GENERAL**

2.1.3 Add a new Subparagraph as follows:

The Owner, as used in these Documents, refers to the OWNER-NAME.

ARTICLE 3 - CONTRACTOR

3.3 **SUPERVISION AND CONSTRUCTION PROCEDURES**

3.3.1 Change the last sentence to read as follows:

If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor; the Owner and Architect shall be responsible for any resulting loss or damage.

3.4 **LABOR AND MATERIALS**

3.4.4 Add a new Subparagraph as follows:

The Contractor shall comply with the Mississippi Employment Protection Act in accordance with Section 71-11-3 of the Mississippi Code 1972, Annotated. The Contractor further agrees to maintain records of such compliance, and upon request of the State, to provide a copy of each such verification to the State.

3.9 **SUPERINTENDENT**

3.9.2 Change the second line in this Subparagraph to read as follows:

The Architect shall, within a reasonable time, notify the Contractor in writing of any objection to the proposed superintendent.

3.15 **CLEANING UP**

3.15.2 Change this Subparagraph to read as follows:

If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the cost thereof shall be charged to the Contractor.

3.18 **INDEMNIFICATION**

3.18.3 Add a new Subparagraph as follows:

The Contractor agrees to defend, hold harmless and indemnify the Owner against all claims or demands caused by the Contractor's acts or omissions.

ARTICLE 4 - ARCHITECT

4.1 **GENERAL**

4.1.4 Add a new Subparagraph as follows:

The term "Architect", "Engineer", or "Professional" as used in these Documents refers to the Professional firm indicated in the Agreement Between the Owner and the Contractor who has been directed by the Owner to design and observe construction of this Project.

4.2 **ADMINISTRATION OF THE CONTRACT**

4.2.1 Change the first line of this Subparagraph to read as follows:

The Architect will provide administration of the Contract as described in the Contract Documents, and will be the Owner's representative (1) during construction, (2) until the final payment is dues and (3) with the Owner's concurrence, from time to time during the one year period for correction of Work described in Section 12.2.

ARTICLE 5 - SUBCONTRACTORS

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 Change the first line of this Subparagraph to read as follows:

Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, within 7 days after written notice by Professional of award of the Contract by the Owner, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work.

ARTICLE 6 - CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

No supplementary conditions.

ARTICLE 7 - CHANGES IN THE WORK

7.2 **CHANGE ORDERS**

7.2.2 Add a new Subparagraph as follows:

The maximum cost included in a Change Order for profit and overhead is limited to twenty percent (20%) of the total of the actual cost for materials, labor and subcontracts. Profit and overhead include: all taxes, fees, permits, insurance, bond, job superintendent and office expense. All Subcontractors shall acquiesce to the same requirements when participating in a Change Order.

7.3 **CONSTRUCTION CHANGE DIRECTIVES**

7.3.9 Delete this Subparagraph in its entirety.

ARTICLE 8 - TIME

8.1 **DEFINITIONS**

8.1.2 Change this Subparagraph to read as follows:

The date of commencement of the work is the date established in the Notice to Proceed.

8.3 **DELAYS AND EXTENSIONS OF TIME**

8.3.1 Change this Subparagraph to read as follows:

If the Contractor is delayed at any time in the commencement or progress of the Work by any act of neglect of the Owner or the Engineer, or by any employee of either, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or any causes beyond the Contractor's control, or by any other causes which the Engineer determines may justify the delay, then the Contract Time may be extended by Change Order for such reasonable time as the Engineer may determine, subject to the Owner's approval. Any claim for loss or any delay occasioned by any separate Contractor, or Subcontractor, shall be settled between the Contractor and such other separate Contractor, or Subcontractors.

ARTICLE 9 - PAYMENTS AND COMPLETION

9.2 **SCHEDULE OF VALUES**

Change this Paragraph to read as follows:

Where the Contract is based on a stipulated sum, the Contractor shall submit to the Architect, at least 10 days before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work, and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect or Owner, shall be used as a basis for reviewing the Contractor's Applications for Payment.

9.3 **APPLICATIONS FOR PAYMENT**

9.3.1 Add a new sentence to the end of this Subparagraph:

The form of Application for Payment will be AIA Document G702, Application and Certification for Payment, supported by AIA Document G703, Continuation Sheet, or a computer generated form containing similar data.

9.3.1.1 Delete this Subparagraph in its entirety.

9.3.1.3 Add a new Clause to Subparagraph 9.3.1 as follows:

On any contract ad described herein, regardless of amount, five percent (5%) shall be retained until the Work is at least fifty percent (50%) complete, on schedule and satisfactory in the architect's and/or engineer's opinion, at which time fifty percent (50%) of the retainage held to date shall be returned to the prime contractor for distribution to the appropriate subcontractors and suppliers; provided, however, that future retainage shall be withheld at the rate of two and one-half percent (2 1/2%).

9.3.1.4 Add a new Clause to Subparagraph 9.3.1 as follows:

The Contractor must submit each month with this Application for Payment a separate letter stating that he is requesting an extension of time or that he had no need for an extension for that period of time. No payment on a monthly application will be considered due and payable until the letter is received. Complete justification such as weather reports or other pertinent correspondence must be included for each day's request for extension. A Contractor's letter, or statement, will not be considered as adequate justification. The receipt of this request and data by the Owner will not be considered as Owner approval in any way.

9.3.2.1 Add a new Clause to Subparagraph 9.3.2 as follows:

Payment on materials stored at some location other than the building site, may be approved by the Engineer and the Owner after the Contractor has submitted the following items:

.1 An acceptable Lease Agreement between the General Contractor and the Owner of the land, or building, where the materials are stored covering the specific area where the materials are located.

.2 Consent of Surety, or other acceptable Bond, to cover the materials stored off-site.

.3 All Perils Insurance coverage for the full value of the materials stored off-site.

.4 A Bill of Sale from the Manufacturer to the General Contractor for the stored materials.

.5 A complete list and inventory of materials manufactured, stored and delivered to the storage site and of materials removed from the storage site and delivered to the job site.

.6 A review by the Engineer of the materials stored off-site prior to release of payment.

.7 Guarantee no storage costs, additional delivery fees, or subsequent costs to the Owner.

9.5 **DECISIONS TO WITHHOLD CCERTIFICATION**

9.5.3 Delete this Subparagraph in its entirety.

9.6 **PROGRESS PAYMENTS**

9.6.2 Change the first line of this Subparagraph to read as follows:

The Contractor shall pay each Subcontractor, in accordance with Section 31-5-27 of the Mississippi Code 1972, Annotated, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work.

9.6.8 Add a new Subparagraph as follows:

The amount retained by the Contractor from each payment to each Subcontractor and material supplier will not exceed the percentage retained by the Owner from the Contractor.

9.6.8.1 Add a new Clause to Subparagraph 9.6.8 as follows:

The Contractors shall submit monthly certification, in accordance with Section 31-5-25 of the Mississippi Code of 1972, Annotated, on Owner's Affidavit Certifying Payment to All Subcontractors" form, to the project engineer or architect indicating payments to subcontractors on prior payment request.

9.6.9.1 The contractor shall be aware that payments to the contractor for this contract will come through the RWAIG Program. It should be noted that payments could take up to 90 days or more to be processed from the time of pay request application.

9.7 **FAILURE OF PAYMENT**

Change this Paragraph to read as follows:

The Contractor and the Owner shall be subject to the remedies as prescribed in Section 31-5-25 of the Mississippi Code 1972, Annotated.

9.8 **SUBSTANTIAL COMPLETION**

9.8.4 Change the first line of this Subparagraph to read as follows:

When the Work or designated portion thereof is substantially complete and affirmed by the Owner, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate.

9.10 **FINAL COMPLETION AND FINAL PAYMENT**

9.10.1 Change this Subparagraph to read as follows:

When, in the opinion of the Contractor, the Work is ready for final inspection and acceptance by the Owner, the Contractor shall make such notice to the Architect in writing.

1. Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance by the Owner, the Architect will promptly inspect the Work and compile a list of deficiencies. If, in the Architect's judgment, the Work is not ready for inspection, another inspection will be scheduled.
2. Once the Architect has mad inspection and all deficiencies listed by the Architect have been corrected and the Architect determines the Work is ready for final inspection, the Architect will call for final inspection of the Project with the Owner for the purpose of determining whether the Work is acceptable under the Contract Documents.
3. The final inspection shall be conducted in the presence of the Owner and a list of defects or discrepancies, if any, will be compiled into a punch list furnished to all parties.
4. Once corrections of all punch list items have been confirmed by the Architect, the Architect will provide a letter recommending final acceptance of the Work to the Owner.

9.10.2 Change this Subparagraph to read as follows:

Neither final payment nor any remaining retained percentage shall become due until

the Contractor submits to the Architect (1) final application for payment, (2) consent of surety to final payment, (3) power of attorney,(4) Contractor's affidavit of release of liens, (5) Contractor's affidavit of payment of debts and claims, (6) Contractor's guarantee of work, (7) Project Record Documents and (8) certificates, warranties, guarantees, bonds or documents as called for in the individual sections of the Project Manual.

9.11 **LIQUIDATED DAMAGES**

9.11.1 Add a new Paragraph as follows:

Time being of the essence and a matter of material consideration thereof, a reasonable estimate in advance is established to cover losses incurred by the Owner if the project is not substantially complete on the date set forth in the Contract Documents. The Contractor and his Surety will be liable for and will pay the Owner the sums stipulated in Paragraph 4.01 of the Agreement between the Owner and the Contractor as fixed and agreed as liquidated damages for each calendar day of delay until the work is

substantially complete unless circumstances dictate otherwise in the discretion of the owner.

ARTICLE 10 - PROTECTION OF PERSONS AND PROPERTY

10.2 **SAFETY OF PERSONS AND PROPERTY**

10.2.5 Change this Subparagraph to read as follows:

The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Clauses 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-Subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts that may be liable and for which the Contractor is responsible for Clauses 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Engineer and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Paragraph 3.18.

10.3 **HAZARDOUS MATERIALS**

10.3.2 Delete this Subparagraph in its entirety.

10.3.3 Delete this Subparagraph in its entirety.

10.3.4 Delete this Subparagraph in its entirety.

10.3.5 Delete this Subparagraph in its entirety.

10.3.6 Delete this Subparagraph in its entirety.

ARTICLE 11 - INSURANCE AND BONDS

11.1 **CONTRACTOR'S LIABILITY INSURANCE**

11.1.4 Delete this Subparagraph in its entirety.

11.1.5 Add a new Subparagraph as follows:

The Contractor's limits of liability shall be written for not less than the following:

.1 GENERAL LIABILITY:

Commercial General Liability (Including XCU)

General Aggregate..... $1,000,000.00 Aggregate

Products & Completed Operations ..... $1,000,000.00 Aggregate

Personal & Advertising Injury .....$500,000.00 Per Occurrence

Bodily Injury & Property Damage .....$500,000.00 Per Occurrence

Fire Damage Liability .....$50,000.00 Per Occurrence

Medical Expense.....$5,000.00 Per Person

.2 OWNERS & CONTRACTORS PROTECTIVE LIABILITY:

Bodily Injury & Property Damage ..... $1,000,000.00 Aggregate

Bodily Injury & Property Damage .....$500,000.00 Per Occurrence

.3 AUTOMOBILE LIABILITY (Owned, Non-owned & Hired Vehicles):

Contractor Insurance Option Number 1:

Bodily Injury & Property Damage .....$500,000.00 Per Occurrence
(Combined Single Limit)

Contractor Insurance Option Number 2:

Bodily Injury .....$250,000.00 Per Person
Bodily Injury .....$500,000.00 Per Accident
Property Damage.....$100,000.00 Per Occurrence

.4 EXCESS LIABILITY (Umbrella on projects over $500,000):

Bodily Injury & Property Damage ..... $1,000,000.00 Aggregate
(Combined Single Limit)

.5 WORKERS' COMPENSATION (As required by Statute):

EMPLOYERS' LIABILITY:

Accident.....$100,000.00 Per Occurrence

Disease.....$500,000.00 Policy Limit

Disease..... $100,000.00 Per Employee

.6 PROPERTY INSURANCE:

Builder's Risk..... $ Equal to Value of Work

or

Installation Floater..... $ Equal to Value of Work

11.1.6 Add a new Subparagraph as follows:

Furnish one (1) copy of the Standard Construction Contract Certificate of Insurance Form for each copy of the Agreement between Owner and Contractor specifically setting forth evidence of all coverage required by Subparagraphs 11.1.1, 11.1.2 and 11.1.3. Furnish to the Owner copies of any endorsements that are subsequently issued amending limits of coverage.

11.1.7 Add a new Subparagraph as follows:

If the coverages are provided on a claims-made basis, the policy date or retroactive date shall predate the contract; the termination date, or the policy, or applicable extended reporting period shall be no earlier than the termination date of coverages required to be maintained after final payment.

11.2 **OWNER'S LIABILITY INSURANCE**

Delete the Paragraph in its entirety and substitute the following:

The Contractor shall purchase and maintain such insurance as will protect the Owner from his contingent liability to others for damages because of bodily injury, including death, and property damage, which may arise from operations under this Contract and other liability for damages which the Contractor is required to insure under any provision of this Contract. Certificate of this insurance will be filed with the Owner and will be the same limits set forth in 11.1.5.

11.3 **PROPERTY INSURANCE (BUILDER'S RISK OR INSTALLATION FLOATER)**

11.3.1 Change the first line in this Subparagraph to read as follows:

The Contractor shall purchase...

11.3.1.2 Delete this Clause under Subparagraph 11.3.1 in its entirety.

11.3.1.3 Change the following Clause in this Subparagraph to read as follows:

If the property insurance requires deductibles, the Contractor shall pay costs not covered because of such deductibles.

11.3.2 Delete this Subparagraph in its entirety.

11.3.3 Delete this Subparagraph in its entirety.

11.3.4 Delete this Subparagraph in its entirety.

11.3.5 Delete this Subparagraph in its entirety.

11.3.6 Delete this Subparagraph in its entirety.

11.3.10 Change this Subparagraph to read as follows:

The Owner as fiduciary shall have power to adjust and settle a loss with Insurers unless one of the parties in interest shall object in writing with five (5) days after occurrence of loss.

ARTICLE 12 - UNCOVERING AND CORRECTION OF WORK

No supplementary conditions.

ARTICLE 13 - MISCELLANEOUS PROVISIONS

13.1 **GOVERNING LAW**

Change this Paragraph to read as follows:

The Contract shall be governed by the laws of the State of Mississippi.

13.5 **TESTS AND INSEPCTIONS**

13.7 Change this Paragraph title to read as follows:

COMMENCEMENT OF STATUTORY LIMITATION PERIOD

13.7.1 Change this Subparagraph to read as follows:

As between the Owner and Contractor:

1. Before Substantial Completion. As to acts or failures to act occurring prior to the relevant date of Substantial Completion, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than such dated of Substantial Completion;
2. Between Substantial Completion and Final Acceptance. As to acts or failures to act occurring subsequent to the relevant date of Substantial Completion and prior to the date of Final Acceptance, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of Final Acceptance; and
3. After the date of Final Acceptance. As to acts or failures to act occurring after the relevant date of Final Acceptance, any applicable statute of

limitation shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of any act of failure to act by the Contractor pursuant to any Warranty provided under Section 3.5, the date of any correction of the Work or failure to correct the Work by the Contractor under Section 12.2, or the date of actual commission of any other act or failure to perform any duty or obligation by the Contractor or Owner, whichever occurs last.

ARTICLE 14 - TERMINATION OR SUSPENSION OF THE CONTRACT

No supplementary conditions.

ARTICLE 15 – CLAIMS AND DISPUTES

15.2 **INITIAL DECISION**

15.2.1 Change this Subparagraph to read as follows:

Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker. An initial decision by the Initial Decision Maker shall be required as a condition precedent or arbitration or litigation of all Claims between the Contractor and Owner arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision maker with no decision having been rendered by the Initial Decision Maker. The Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

END OF SECTION 00800

SUPPLEMENTAL GENERAL CONDITIONS

FOR

CONSTRUCTION OF AMERICAN RESCUE PLAN ACT RURAL WATER INFRASTRUCTURE GRANT PROGRAM PROJECTS

March 2023

TABLE OF CONTENTS

The attached instructions and regulations as listed below shall be incorporated into the Contract Documents.

These Supplemental General conditions shall supersede any conflicting provisions of this contract.

SPECIAL PROVISIONS

(a) Construction shall be carried out so as to prevent the bypassing of wastewater during construction.

(b) Best Management Practices (BMP's) shall be used for erosion and sediment control on the construction site.

(c) Disturbed areas shall be restored to the original or better condition.

(d) It is the duty of the Contractor, the owner and the engineer to insure the construction of the project, including the letting of contracts in connection therewith, complies with all applicable laws and regulations and requirements of the United States of America or any agency thereof, the State of Mississippi or any agency thereof, or any local government or political subdivision to the extent that such requirements do not conflict with Federal laws and regulations and any regulations or policies established by the Mississippi State Department of Health.

(e) The Contractor agrees to indemnify and save, release and hold harmless the State of Mississippi, the Department, and all of their employees and officers from and against any and all claim, demand, cause of action, liability, loss, damage, injury, suit, judgement, debt and cost, including attorney's fees or expenses on the part of Contractor or Subcontractor or their agents or employees or any other parties arising out of or incident to, any and all work under the terms of this contract.

(f) Upon execution of this contract between the Owner and the Contractor, the State of Mississippi, the Department, and all their employees and officers do not assume any authorities, duties, responsibilities, or liabilities under such contract.

(g) The State of Mississippi, the Department and all their employees and officers, do not have any authority, duty, responsibility, or liability in contract claims identification, negotiation, resolution, or any other actions regarding contract claims under this contract.

(h) No actions taken by the State of Mississippi, the Department, and all their employees and officers, either directly or indirectly, regarding this contract, constitute or establish any determinations, authority, duty, responsibility, or liability under this contract.

(i) The Owner and the Contractor must resolve all claims and contract disputes, as provided in the contract documents, prior to the Owner's submission of any documents regarding ARPA RWAIG participation to the Department.

GENERAL CONDITIONS

PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA

(NOTE - The following clause applies to (1) any subagreement negotiated between the Grant Recipient and its Contractor in excess of $100,000; (2) negotiated subagreement amendments or change orders in excess of $100,000 affecting the price of formally advertised, competitively awarded, fixed price subagreement, or (3) any lower tier subagreement or purchase order in excess of $100,000 under a subagreement other than a formally advertised, competitively awarded, fixed price subagreement. This clause does not apply to subagreements awarded on the basis of effective price competition.)

(a) The Contractor and Subcontractor, where appropriate, assure that the cost and pricing data submitted for evaluation with respect to negotiation of prices for negotiated subagreements, lower tier subagreements, and change orders is based on current, accurate and complete data supported by their books and records. If the Grant Recipient or Department Staff determine that any price (including profit) negotiated in connection with this subagreement, lower tier subagreement, or amendment thereunder was increased by any significant sums because the data provided was incomplete, inaccurate, or not current at the time of submission, then such price or cost or profit shall be reduced accordingly and the recipient shall modify the subagreement in writing to reflect such action.

(b) Failure to agree on a reduction shall be subject to the remedies clause of this subagreement.

(Note: Since the agreement is subject to reduction under this clause by reason of defective cost or pricing data submitted in connection with lower tier subagreements, the Contractor may wish to include a clause in each lower tier subagreement requiring the lower tier subcontractor to appropriately indemnify the Contractor. It is also expected that any lower tier Subcontractor subject to such indemnification will generally require substantially similar indemnification for defective cost or pricing data submitted by lower tier contractors.)

AUDIT; ACCESS TO RECORDS

(a) The Contractor shall maintain books, records, documents and other evidence directly pertinent to performance on State funded work under this subagreement in accordance with generally accepted accounting principles and practices consistently applied, and 40 CFR Part 31 in effect on the date of execution of this subagreement. The Contractor shall also maintain the financial information and data used in the preparation or support of the cost submission required under 40 CFR 33.290 for any negotiated subagreement or change order and a copy of the cost summary submitted to the Grant Recipient. The United States Department of the Treasury, the Comptroller General of the United States, the Grant Recipient, and the State of Mississippi or any of their authorized representatives shall have access to all such books, records, documents and either evidence for the purpose of

inspection audit and copying during normal business hours. The Contractor shall provide proper facilities for such access and inspection.

(b) If this is a formally advertised, competitively-awarded, fixed price subagreement, the Contractor agrees to make paragraphs (a) through (g) of this clause applicable to all negotiated change orders and subagreement amendments affecting the subagreement price. In the case of all other types of prime subagreements, the Contractor agrees to make paragraphs (a) through (g) applicable to all subagreements be awarded in excess of $10,000, at any tier, and to make paragraphs (a) through (g) of this clause applicable to all change orders directly related to project performance.

(c) Audits conducted under this provision shall be in accordance with generally accepted auditing standards and with established procedures and guidelines of the reviewing or audit agency(ies).

(d) The Contractor agrees to disclose all information and reports resulting from access to records under paragraphs (a) and (b) of this clause to any of the agencies referred to in paragraph (a).

(e) Records under paragraphs (a) and (b) above shall be maintained by the Contractor during performance on State assisted work under this subagreement and for the time periods specified in 2 CFR Part 200.334. In addition, those records which relate to any controversy arising under a State assistance agreement, litigation, the settlement of claims arising out of such performance or to costs or items to which an audit exception has been taken shall be maintained by the Contractor for the time periods specified in 2 CFR Part 200.334

(f) Access to records is not limited to the required retention periods. The authorized representatives designated in paragraph (a) of this clause shall have access to records at any reasonable time for as long as the records are maintained.

(g) This right of access clause applies to financial records pertaining to all subagreements (except formally advertised competitively awarded, fixed price subagreements) and all subagreement change orders regardless of the type of subagreement, and all subagreement amendments regardless of the type of subagreement. In addition this right of access applies to all records pertaining to all subagreements, subagreement change orders and subagreement amendments:

(1) To the extent the records pertain directly to subagreement performance

(2) If there is any indication that fraud, gross abuse or corrupt practices may be involved, or

(3) If the subagreement is terminated for default or for convenience.

COVENANT AGAINST CONTINGENT FEES

The Contractor assures that no person or selling agency has been employed or retained to solicit or secure this subagreement upon an agreement or understand for a commission, percentage, brokerage, or contingent fee, excepting bonafide employees or bonafide established commercial or selling agencies maintained by the Contractor for the purpose of securing business. For breach or violation of this assurance, the Grant Recipient shall have the right to annul this agreement without liability or, at its discretion, to deduct from the contract price or consideration, or otherwise recover the full amount of such commission, percentage brokerage or contingent fee.

GRATUITIES

(a) If the Grant Recipient finds after a notice and hearing that the Contractor or any of the Contractor's agents or representatives offered or gave gratuities (in the form of entertainment, gifts, or otherwise) to any official, employee, or agent of the Grant Recipient, or the State in an attempt to secure a subagreement or favorable treatment in awarding, amending, or making any determination related to the performance of this subagreement, the Grant Recipient may, by written notice to the Contractor, terminate this subagreement. The Grant Recipient may also pursue other rights and remedies that the law or this subagreement provides. However, the existence of the facts on which the Grant Recipient bases such findings shall be in issue and may be reviewed in proceedings under the Remedies clause of this subagreement.

(b) In the event this subagreement is terminated as provided in paragraph (a), the Grant Recipient may pursue the same remedies against the Contractor as it could pursue in the event of a breach of the subagreement by the Contractor, and as a penalty, in addition to any other damages to which it may be entitled by law, be entitled to exemplary damages in an amount (as determined by the recipient) which shall be not less than three nor more than ten times the costs the Contractor incurs in providing any such gratuities to any such officer or employee.

COMPLIANCE WITH THE COPELAND "ANTI-KICKBACK ACT"

The contractor shall comply with 18 U.S.C. § 874,40 U.S.C. § 3145, and the requirements of 29 C.F.R. Part 3 as may be applicable, which are incorporated by reference into this contract.

COMPLIANCE WITH THE DOMESTIC PREFERENCE REQUIREMENT

The contractor shall comply with the requirements of 2 C.F.R. Part 200.322 as may be applicable, which are incorporated by reference into this contract.

EEO DOCUMENTS

EEO Notice

Following is the standard language which must be incorporated into all solicitations for offers and bids on all ARPA RWAI Grant Program - assisted construction contracts or subcontracts in excess of $10,000 to be performed in designated geographical areas:

NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL OPPORTUNITY (EXECUTIVE ORDER 11246)

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" which is included in the Nondiscrimination Provision, Labor Standards and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

2. (See Goals)

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontractor; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.

4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is *(insert description of the geographical areas where the contract is to be performed giving the state, county and city, if any).*

EQUAL EMPLOYMENT OPPORTUNITY CLAUSE

SEE LABOR STANDARDS PROVISIONS AND NONDISCRIMINATION PROVISIONS

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION

CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)

EEO Specifications

Following is the standard language which must be incorporated into all solicitations for offers and bids on all federal and federally assisted construction contracts or subcontracts in excess of $10,000 to be performed in designated geographical areas:

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)

1. As used in these specifications:

   a. "Covered area" means the geographical area described in the solicitation from which this contract resulted

   b. "Director" means Director, Office of Federal Contract Compliance Program, United States Department of Labor, or any person to whom the Director delegates authority

   c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941

   d. "Minority" includes:

      (i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin)

      (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race)

      (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands), and

      (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable

tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $10,000 the provisions of these specifications and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other contractors or subcontractors toward a goal in an approved Plan does not excuse any covered contractor's or subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications. Executive Order 11246, or the regulations promulgated pursuant thereto.

6. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

    a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with

specific attention to minority or female individuals working at such sites or in such facilities.

b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources complied under 7b above.

f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at lease once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, lay-off, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as superintendents, general foreman, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time

and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other contractors and subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associates.

p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligation.

7. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the Contractor is a member and participant may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is under-utilized).

10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The Contractor shall not enter into any subcontract with any person or firm debarred from government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

40 CFR PART 8, EQUAL OPPORTUNITY REQUIREMENTS

During the performance of this contract, the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this equal opportunity (federally assisted construction) clause.

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

(3) The Contractor will send to each labor union or representative of workers, with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representative of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The Contractor will comply with all provisions of Executive Order No. 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(5) The Contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(6) In the event of the Contractor's non-compliance with the equal opportunity (federally assisted construction) clause of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended, in whole or in part, and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order No. 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, or by rule, regulations, or order of the Secretary of Labor, or as provided by law.

(7) The Contractor will include this equal opportunity (federally assisted construction) clause in every subcontract or purchase order unless exempted by the rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor, as a result of such direction by the administering agency the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: provided that if the applicant so participating is a state or local government, the above equal opportunity clause is not applicable to any agency, instrumentally or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the Agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor; that it will furnish the Agency and the Secretary of Labor such information as they may require for the supervision of such compliance; and that it will otherwise assist the Agency in the discharge of its primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to the Order with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Order and will carry out such sanctions and penalties for violation of the equal opportunity clause, as may be imposed upon contractors and subcontractors by the Agency or the Secretary of Labor pursuant to Part II, Subpart D of the Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the Agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, grant, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refusal occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

SPECIAL NOTICE #1
EEO DOCUMENTATION REQUIRED BY FEDERAL EXECUTIVE ORDER 11246 AS AMENDED

Federal Executive Order 11246 requires an EEO commitment of the prime contractor and all subcontractors (in excess of $10,000). EEO Affirmative Action is mandated throughout the duration of the contract.

Failure to submit the required EEO documentation may subject the Contractor to sanctions under Executive Order 11246.

THE LOW, RESPONSIVE, RESPONSIBLE BIDDER MUST FORWARD THE FOLLOWING ITEMS, IN DUPLICATE TO THE OWNER NO LATER THAN 10 DAYS AFTER BID OPENING. THE OWNER SHALL TRANSMIT 1 COPY TO MSDH WITHIN 14 DAYS AFTER BID OPENING.

1. ARPA RWAIG Project Number. Project Location. Type of Construction.

2. Copy of EEO-1 Report (Employer Information Report, annually submitted to the Equal Employment Opportunity Commission). Required for Firms with 100 employees or more.

3. Copy of the Affirmative Action Plan of the Contractor. Indicate company official responsible for EEO.

4. List of current construction contracts, with dollar amount. List contracting federal agency, if applicable.

5. Statistics concerning company percent workforce, permanent and temporary, by sex, race, and trade.

6. List of employment sources for project in question. If union sources are utilized, indicate percentage of minority membership within the union crafts.

7. Anticipated employment needs for this project, by sex, race, and trade, with estimate of minority participation in specific trades.

8. List of subcontractors (name, address and telephone) with dollar amount and duration of subcontract. Subcontractors' contracts over $10,000 must submit items one (1) through eight (8).

9. List of any subcontract work yet to be committed with estimate of dollar amount and duration of contract.

10. Contract Price. Duration of prime contract.

11. Each Contractor shall be required to maintain in their files a CC-257, monthly Employment Utilization Report, for each month of the construction period.

FEDERAL CONDITIONS

For purposes of this Section, the Contractor shall be required to comply with all applicable contract provisions under Appendix II to 2 CFR 200 as referenced herein

ACCESS. The Mississippi State Department of Health (MSDH), the subgrantees (Rural Water Associations), the United States Department of Treasury (USDT), the Comptroller General of the United States, and any other duly authorized representatives to any of these bodies shall have access to any and all books, documents, papers, and records of the Subgrantee which are directly pertinent to this specific contract for the purpose of making audit, examination, excerpts, and transcriptions, all in compliance with section 602(c) of the Social Security Act.

BYRD ANTI-LOBBYING AMENDMENT. Subgrantee shall certify 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 any Federal contract, grant or any other award covered by 31 U.S. C. 1352. Subgrantee shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal Award. Subgrantee shall require all contractors and lower-tier subgrantees to submit these same certifications. Subgrantee shall adhere to mandatory standards and policies on energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. 6201).

CLEAN AIR AND WATER ACTS COMPLIANCE.

1) The Subgrantee agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. 7401 et seq. and the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.
2) The Subgrantee agrees to report each violation to the Mississippi Department of Environmental Quality and understands and agrees that the Mississippi Department of Environmental Quality will, in turn, report each violation as required to assure notification to the (name of recipient), Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.
3) The Subgrantee agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by USDT.

ENERGY EFFICIENCY. Subgrantee shall adhere to mandatory standards and policies on energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. 6201).

PROCUREMENT OF RECOVERED MATERIALS.

1) In the performance of this contract, the Subgrantee shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired
    i. Competitively within a timeframe providing for compliance with the contract performance schedule;

ii. Meeting contract performance requirements; or
iii. At a reasonable price.

Information about this requirement, along with the list of EPA designate items, is available at EPA's Comprehensive Procurement Guidelines website, https://www.epa.gov/smm/comprehensiveprocurementguideline-cpg-program

SUSPENSION AND DEBARMENT.

1) This contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such the Contractor is required to verify that none of the Contractor, its principals (defined at 2 C.F.R. 180.995), or its affiliates (defined at 2 C.F.R. 180.905) are excluded (defined at 2 C.F.R. 180.940) or disqualified (defined at 2 C.F.R. 180.935).
2) The Contractor must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.
3) This certification is a material representation of fact relied upon by MSDH. If it is later determined that the Contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to MSDH, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.
4) The bidder or proposer agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

RETENTION OF RECORDS. Subgrantee shall retain all records associated with this contract for five (5) years after funds have been expended or the money returned to the Treasury, whichever is later Records retained shall be sufficient to evidence compliance with section 602(c), Treasury's regulations implementing that section as well as guidance issued by Treasury regarding the foregoing.

USDT SEAL, LOGO, AND FLAGS. The Subgrantee shall not use the USDT seal(s), logos, crests, or reproductions of flags or likenesses of USDT agency officials without specific USDT pre-approval.

COMPLIANCE WITH FEDERAL LAW, REGULATIONS, AND EXECUTIVE ORDERS. This is an acknowledgement that USDT financial assistance will be used to fund the contract. The Subgrantee will comply with all applicable federal law, regulations, executive orders, USDT policies, procedures, and directives.

NO OBLIGATION BY FEDERAL GOVERNMENT. The Federal Government is not a party to this contract and is not subject to any obligations or liabilities to the non-Federal entity, Subgrantee, or any other party pertaining to any matter resulting from the contract.

PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS OR RELATED ACTS. The Subgrantee acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to its actions pertaining to the contract.

COMPLIANCE WITH THE CONTRACT WORK HOURS AND SAFETY STANDARDS ACT.

1) Overtime requirements. No Contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2) Violation: Liability For Unpaid Wages and Liquidated Damages. In the event of any violation of the clause set forth in paragraph (1) of this section the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory).

UNIFORM GUIDANCE. Subgrantee agrees they are subject to compliance with all applicable Uniform Guidance as outlined in 2 CFR 200, 2 CFR 180 and the Final Rules of the Coronavirus State and Local Fiscal Recovery Funds (SLFRF).

U.S. DEPARTMENT OF THE TREASURY CORONAVIRUS STATE FISCAL RECOVERY FUND
AWARD TERMS AND CONDITIONS

1) Use of Funds.
    a. Recipient understands and agrees that the funds disbursed under this award may only be used in compliance with section 602(c) of the Social Security Act (the Act) and Treasury's regulations implementing that section and guidance.
    b. Recipient will determine prior to engaging in any project using this assistance that it has the institutional, managerial, and financial capability to ensure proper planning, management, and completion of such project.

2) Period of Performance. The period of performance for this award begins on the date hereof and ends on December 31, 2026. As set forth in Treasury's implementing regulations, Recipient may use award funds to cover eligible costs incurred during the period that begins on March 3, 2021, and ends on December 31, 2024.

3) Reporting. Recipient agrees to comply with any reporting obligations established by Treasury as they relate to this award.

4) Maintenance of and Access to Records
    a. Recipient shall maintain records and financial documents sufficient to evidence compliance with section 602(c), Treasury's regulations implementing that section, and guidance issued by Treasury regarding the foregoing.
    b. The Treasury Office of Inspector General and the Government Accountability Office, or their authorized representatives, shall have the right of access to records (electronic and otherwise) of Recipient in order to conduct audits or other investigations.
    c. Records shall be maintained by Recipient for a period of five (5) years after all funds have been expended or returned to Treasury, whichever is later.

5) Pre-award Costs. Pre-award costs, as defined in 2 C.F.R. § 200.458, may not be paid with funding from this award.

6) Administrative Costs. Recipient may use funds provided under this award to cover both direct and indirect costs.

7) Cost Sharing. Cost sharing or matching funds are not required to be provided by Recipient.

8) Conflicts of Interest. Recipient understands and agrees it must maintain a conflict of interest policy consistent with 2 C.F.R. § 200.318(c) and that such conflict of interest policy is applicable to each activity funded under this award. Recipient and subrecipients must disclose in writing to Treasury or the pass-through entity, as appropriate, any

potential conflict of interest affecting the awarded funds in accordance with 2 C.F.R. § 200.112.

9) Compliance with Applicable Law and Regulations.
    a. Recipient agrees to comply with the requirements of section 602 of the Act, regulations adopted by Treasury pursuant to section 602(f) of the Act, and guidance issued by Treasury regarding the foregoing. Recipient also agrees to comply with all other applicable federal statutes, regulations, and executive orders, and Recipient shall provide for such compliance by other parties in any agreements it enters into with other parties relating to this award.
    b. Federal regulations applicable to this award include, without limitation, the following:
        i. Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, 2 C.F.R. Part 200, other than such provisions as Treasury may determine are inapplicable to this Award and subject to such exceptions as may be otherwise provided by Treasury. Subpart F – Audit Requirements of the Uniform Guidance, implementing the Single Audit Act, shall apply to this award.
        ii. Universal Identifier and System for Award Management (SAM), 2 C.F.R. Part 25, pursuant to which the award term set forth in Appendix A to 2 C.F.R. Part 25 is hereby incorporated by reference.
        iii. Reporting Subaward and Executive Compensation Information, 2 C.F.R. Part 170, pursuant to which the award term set forth in Appendix A to 2 C.F.R. Part 170 is hereby incorporated by reference.
        iv. OMB Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement), 2 C.F.R. Part 180, including the requirement to include a term or condition in all lower tier covered transactions (contracts and subcontracts described in 2 C.F.R. Part 180, subpart B) that the award is subject to 2 C.F.R. Part 180 and Treasury's implementing regulation at 31 C.F.R. Part 19.
        v. Recipient Integrity and Performance Matters, pursuant to which the award term set forth in 2 C.F.R. Part 200, Appendix XII to Part 200 is hereby incorporated by reference.
        vi. Governmentwide Requirements for Drug-Free Workplace, 31 C.F.R. Part 20.
        vii. New Restrictions on Lobbying, 31 C.F.R. Part 21.
        viii. Uniform Relocation Assistance and Real Property Acquisitions Act of 1970 (42 U.S.C. §§ 4601-4655) and implementing regulations.
        ix. Generally applicable federal environmental laws and regulations.
    c. Statutes and regulations prohibiting discrimination applicable to this award include, without limitation, the following:
        i. Title VI of the Civil Rights Act of 1964 (42 U.S.C. §§ 2000d et seq.) and Treasury's implementing regulations at 31 C.F.R. Part 22, which prohibit discrimination on the basis of race, color, or national origin under programs or activities receiving federal financial assistance;

ii. ii. The Fair Housing Act, Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§ 3601 et seq.),which prohibits discrimination in housing on the basis of race, color, religion, national origin, sex, familial status, or disability;

iii. Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. § 794), which prohibits discrimination on the basis of disability under any program or activity receiving federal financial assistance;

iv. The Age Discrimination Act of 1975, as amended (42 U.S.C. §§ 6101 et seq.), and Treasury's implementing regulations at 31 C.F.R. Part 23, which prohibit discrimination on the basis of age in programs or activities receiving federal financial assistance; and

v. Title II of the Americans with Disabilities Act of 1990, as amended (42 U.S.C. §§ 12101 et seq.), which prohibits discrimination on the basis of disability under programs, activities, and services provided or made available by state and local governments or instrumentalities or agencies thereto.

10) Remedial Actions. In the event of Recipient's noncompliance with section 602 of the Act, other applicable laws, Treasury's implementing regulations, guidance, or any reporting or other program requirements, Treasury may impose additional conditions on the receipt of a subsequent tranche of future award funds, if any, or take other available remedies as set forth in 2 C.F.R. § 200.339. In the case of a violation of section 602(c) of the Act regarding the use of funds, previous payments shall be subject to recoupment as provided in section 602(e) of the Act and any additional payments may be subject to withholding as provided in sections 602(b)(6)(A)(ii)(III) of the Act, as applicable.

11) Hatch Act. Recipient agrees to comply, as applicable, with requirements of the Hatch Act (5 U.S.C. §§ 1501-1508 and 7324-7328), which limit certain political activities of State or local government employees whose principal employment is in connection with an activity financed in whole or in part by this federal assistance.

12) False Statements. Recipient understands that making false statements or claims in connection with this award is a violation of federal law and may result in criminal, civil, or administrative sanctions, including fines, imprisonment, civil damages and penalties, debarment from participating in federal awards or contracts, and/or any other remedy available by law.

13) Publications. Any publications produced with funds from this award must display the following language: "This project [is being] [was] supported, in whole or in part, by federal award number [enter project FAIN] awarded to [name of Recipient] by the U.S. Department of the Treasury."

14) Debts Owed the Federal Government.

a. Any funds paid to Recipient (1) in excess of the amount to which Recipient is finally determined to be authorized to retain under the terms of this award; (2) that are determined by the Treasury Office of Inspector General to have been misused; or (3) that are determined by Treasury to be subject to a repayment obligation pursuant to sections 602(e) and 603(b)(2)(D) of the Act and have not been repaid by Recipient shall constitute a debt to the federal government.

b. Any debts determined to be owed the federal government must be paid promptly by Recipient. A debt is delinquent if it has not been paid by the date specified in Treasury's initial written demand for payment, unless other satisfactory arrangements have been made or if the Recipient knowingly or improperly retains funds that are a debt as defined in paragraph 14(a). Treasury will take any actions available to it to collect such a debt.

15) Disclaimer.

a. The United States expressly disclaims any and all responsibility or liability to Recipient or third persons for the actions of Recipient or third persons resulting in death, bodily injury, property damages, or any other losses resulting in any way from the performance of this award or any other losses resulting in any way from the performance of this award or any contract, or subcontract under this award.

b. The acceptance of this award by Recipient does not in any way establish an agency relationship between the United States and Recipient.

16) Protections for Whistleblowers.

a. In accordance with 41 U.S.C. § 4712, Recipient may not discharge, demote, or otherwise discriminate against an employee in reprisal for disclosing to any of the list of persons or entities provided below, information that the employee reasonably believes is evidence of gross mismanagement of a federal contract or grant, a gross waste of federal funds, an abuse of authority relating to a federal contract or grant, a substantial and specific danger to public health or safety, or a violation of law, rule, or regulation related to a federal contract (including the competition for or negotiation of a contract) or grant.

b. The list of persons and entities referenced in the paragraph above includes the following:

i. A member of Congress or a representative of a committee of Congress;
ii. An Inspector General;
iii. The Government Accountability Office;
iv. A Treasury employee responsible for contract or grant oversight or management;
v. An authorized official of the Department of Justice or other law enforcement agency;
vi. A court or grand jury; or

vii. A management official or other employee of Recipient, contractor, or subcontractor who has the responsibility to investigate, discover, or address misconduct.

c. Recipient shall inform its employees in writing of the rights and remedies provided under this section, in the predominant native language of the workforce.

17) Increasing Seat Belt Use in the United States. Pursuant to Executive Order 13043, 62 FR 19217 (Apr. 18, 1997), Recipient should encourage its contractors to adopt and enforce on-the-job seat belt policies and programs for their employees when operating company-owned, rented or personally owned vehicles.

18) Reducing Text Messaging While Driving. Pursuant to Executive Order 13513, 74 FR 51225 (Oct. 6, 2009), Recipient should encourage its employees, subrecipients, and contractors to adopt and enforce policies that ban text messaging while driving, and Recipient should establish workplace safety policies to decrease accidents caused by distracted drivers.

TECHNICAL SPECIFICATIONS

FOR

NEW 800 G.P.M. WATER TREATMENT PLANT

SECTION 01025 MEASUREMENT AND PAYMENT

PART 1 – GENERAL

1.01 DESCRIPTION

A. CONTRACTOR shall furnish all labor, materials, tools, equipment, appurtenances and all services necessary to perform all Work required, at the lump sum or unit prices for the items listed herein.

B. The items listed below beginning with Article 1.03, refer to and are the same pay items listed in the Proposal. They constitute all of the pay items for the completion of the Contract. No direct or separate payment will be made for providing miscellaneous temporary or accessory works, plant, services, CONTRACTOR'S or ENGINEER'S field offices, layout surveys, job signs, sanitary requirements, testing, safety devices, approval and record drawings, water supplies, power, removal of waste, watchmen, bonds, insurance, and all other requirements of the Contract Documents. Compensation for all such services, things and materials shall be included in the prices stipulated for the lump sum and unit pay items listed herein.

1.02 ENGINEER'S ESTIMATE OR QUANTITIES

The ENGINEER'S estimated quantities for unit bid prices, as listed in the Bid Form, are approximate only and are included solely for the purpose of comparison of Bids. The OWNER does not expressly or by implication agree that the nature of the materials encountered below the surface of the grounds or the actual quantities of material encountered or required will correspond therewith and reserves the right to increase or decrease any quantity or to eliminate any quantity as OWNER may deem necessary.

1.03 GENERAL SECTIONS

02105 MOBILIZATION

A. METHOD OF MEASUREMENT: Measurement for payment will be in accordance with the following schedule:

1. Will be eligible for payment of sixty (60) percent of the amount bid for mobilization with the first pay application.

2. The remaining forty (40) percent of the amount bid for mobilization will be eligible for payment with the final pay application or substantial completion of the project.

B. BASIS OF PAYMENT: Mobilization will be paid for at the contract lump sum price, which shall be full compensation for completing the work specified.

Payment will be made under:

Item 2 - Mobilization..... Per Lump Sum (LS)

04400 WATER TREATMENT PLANT

The cost of all design, studies, work, labor, and materials associated with the construction of the new Water Treatment Plants as detailed on the construction drawings and as per the specifications and any other sections of the specifications required for the full completion of the Water Treatment Plant shall be included in the contract lump sum bid price which shall be full compensation for completing the work. Payment will be made under:

PH Adjustment Water Treatment Plant ..... Per Lump Sum (LS)

Iron Removal Water Treatment Plant..... Per Lump Sum (LS)

Deductive Alternates:

600 GPM Aerator in Lieu of 800 GPM Aerator ..... Per Lump Sum (LS)

600 GPM Service Pumps in Lieu of 800 GPM Service Pumps

..... Per Lump Sum (LS)

Remove One (1) Pressure Filter, Foundation, Piping, and Appurtenances

..... Per Lump Sum (LS)

28,000 Gallon Clearwell in Lieu of 34,000 Gallon Clearwell ... Per Lump Sum (LS)

04100 WATER DISTRIBUTION

A. Water Distribution Pipe shall be paid for at the unit price per linear foot of pipe in place in open cut trenches or open cut excavations, or encased within steel or pvc, measured along the top centerline of the pipe between intersecting centerlines or ends of pipes, and through fittings and valves.

B. This pay item is to include all materials and labor required to install, modify, construct, and reconstruct gate valves required specified in the construction drawings and the specifications. Payment will be made under:

10” Gate Valve ……..Per Each (EA)

C. This pay item is to include all materials and labor required to install, modify, construct, and reconstruct ductile iron fittings required for total completion of the project as specified in the construction drawings and specifications. Payment will be made under:

Ductile Iron Fittings ……Per Pound (LB)

D. This pay item is to include all labor required to connect to existing water mains required for full completion of the project as specified in the construction drawings and specifications. Payment will be made under:

Connection to Existing Water Main……..…….Per Each (EA)

E. This pay item is to include all materials and labor required to install, modify, construct, and reconstruct the manhole required for full completion of the project specified on the construction drawings and specifications. Payment will be made under:

48” Precast Manhole…… ……..Per Each (EA)

CONTROLS

The cost of all work, labor, and materials associated with the construction of the controls as detailed on the construction drawings shall be included in the contract lump sum bid price which shall be full compensation for completing the work. Payment will be made under:

Electrical Controls ..... Per Lump Sum (LS)

GENERATOR SPEC (ATS)

The cost of all work, labor, and materials associated with the construction of the generator as detailed on the construction drawings and specifications shall be included in the contract lump sum bid price which shall be full compensation for completing the work. Payment will be made under:

Automatic Transfer Switch ..... Per Lump Sum (LS)

DETENTION POND

The cost of all work, labor, and materials associated with the construction of the detention pond as detailed on the construction drawings and specifications shall be included in the contract lump sum bid price which shall be full compensation for completing the work. Payment will be made under:

Detention Pond ..... Per Lump Sum (LS)

EARTHWORK

The cost of all work, labor, and borrow materials associated with the completion of earthwork as detailed on the construction drawings and specifications shall be included in the contract lump sum bid price which shall be full compensation for completing the work. Payment will be made under:

Earthwork ..... Per Lump Sum (LS)

The cost of all work, labor, and materials associated with the installation of 610 crushed stone as detailed on the construction drawings and specifications shall be included in the contract per ton bid price which shall be full compensation for completing the work. Payment will be made under:

610 Crushed Stone ..... Per Ton (TON)

END OF SECTION 01025

SECTION 02100

SCOPE OF WORK

PART 1 – GENERAL

1.01 Pre-qualifications of Bidders. Refer to Instructions for Bidders.

1.02 Contractor is to furnish all labor, material, tools, equipment, business license, and full time supervision to complete the project as called for in the Contract Documents and Specifications.

1.03 Contractor is responsible for visiting the site to become familiar with existing conditions. Refer to Section S-102.05 of the Mississippi Standard Specifications for State Aid Road and Bridge Construction.

1.04 The Contractor will warrant all materials and labor for a period of one (1) year for all work performed by the Contractor or Subcontractor unless otherwise specified herein.

1.05 The Contractor shall prepare a set of "As-built" mark-ups. Refer to the General Conditions.

1.06 All permits, licenses, fees, etc., which are required for the performance of this work will be the responsibility of the Contractor.

1.07 Clean-up and disposal of any debris associated with this scope of work will be the responsibility of the Contractor. Contractor to provide his own dumpsters. Refer to Section S-104.07 of the Mississippi Standard Specifications for State Aid Road and Bridge Construction.

1.08 Contractor shall clear and grub the site within the construction and clearing limits and as indicated on the plans and as necessary to construct the work in accordance with the plans.

1.09 Contractor shall furnish and install all materials for proper erosion control and secure permit from any and all governing authorities. Maintenance of erosion control structures until project completion is the responsibility of the Contractor. There will be no pay item for temporary erosion control measures.

1.10 Contractor shall remove topsoil to the specified depths and as directed by the Engineer and store on site in designated area identified on the plans. Contractor shall plate areas prior to grassing as shown on the plans. No pay item.

1.11 All trash and debris such as trees and brush shall be removed from site by the Contractor. Contractor will be responsible for removing debris from the site and disposing of it in a satisfactory manner.

1.12 The Owner will mark trees to be saved. Specific care will be taken by the Contractor as not to damage any trees as may be designated to be saved.

1.13 Contractor shall be responsible for keeping all public roadways clean during the execution of the work.

1.14 Contractor shall provide dust control as required during the execution of the work.

1.15 Contractor shall be responsible for holding weekly safety meetings with all construction personnel and sending a copy to the Engineer with list of attendants and items discussed.

1.16 The Contractor shall provide 3 phase power as required for the well.

1.17 After award and prior to mobilization, Contractor shall be required to attend a preconstruction meeting on site with the Engineer, Owner, and Contractor's designated superintendent and project manager.

1.18 Contractor shall re-seed, mulch, and fertilize all areas disturbed by construction activities and assure a complete stand of grass is achieved.

1.19 The Contractor will be responsible for all dewatering and temporary shoring associated with the work. No pay item.

1.20 The location of existing utilities indicated is approximate and those shown on the plans are not necessarily all that may exist on the site. The Contractor shall verify the location of existing utilities on the project site, whether indicated on the plans or not, and shall promptly repair those which are damaged by his construction operation.

1.21 Contractor shall field verify the planned quantities prior to ordering materials.

1.22 All work for which no pay items are provided in the proposal will not be paid for directly and compensation therefor shall be considered included in the prices and payment for bid items.

1.23 Contractor shall meet the requirements of the M.U.T.C.D. for this project.

END OF SECTION

SECTION 02200

SHOP DRAWINGS SUBMITTALS

PART 1 - GENERAL

1.01 SCOPE: This special provision covers the general mechanics of the shop drawing submittal procedures to be followed under this contract.

1.02 SUBMITTALS:

A. Engineering data covering all equipment and fabricated products to be furnished under these contract documents shall be submitted to the Engineer for review.

B.All drawings and diagrams shall be submitted full size of the original or reduced to half size except that no submittal shall be on sheet sizes larger than 24" × 36" and no reduction shall render any detail illegible or result in a sheet size less than 8½" × 11".

C.At the time of each submission, the Contractor shall in writing call the Engineer's attention to any deviations that the engineering data may have from the requirements of these contract documents.

D.The Engineer will review the engineering data submitted in a timely and expeditious manner, provided the data is submitted in accordance with these contract documents, is complete and is suitable for his review.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.01 Three copies of each drawing and necessary data shall be submitted to the Engineer. Each drawing or data sheet shall be clearly marked to include:

A. Name of project;
B. Contractor's name; and
C. References to applicable specification paragraphs and drawing sheets.

When catalog pages are submitted, the applicable items shall be identified by an arrow or encircled (do not use colored highlighters).

3.02 When the drawings and data are returned marked "NOT APPROVED", the corrections shall be made as noted thereof and as instructed by the Engineer and not less than three corrected copies resubmitted. Not less than three additional copies of all such drawings and data shall be furnished after final review (for a total of six).

3.03 Unless otherwise directed by the Engineer, when drawings and data are returned marked "APPROVED AS NOTED", the changes shall be made as noted thereon and not less than six corrected copies shall be furnished. Failure to submit the required final corrected copies of the drawings in a timely manner will be cause for suspension of further payment.

3.04 All corrections and changes made on the drawings or data sheets other than those noted by the Engineer shall be clearly identified with a revision symbol and shall be suitably documented on the drawing with a brief description and date.

3.05 When the drawings and data are returned marked "APPROVED", not less than three additional copies shall be furnished.

No work shall be performed in connection with the fabrication or manufacture of materials and equipment, nor shall any accessory or appurtenance be purchased until the drawings and data therefor have been reviewed by the Engineer and returned marked "APPROVED" or "APPROVED AS NOTED".

3.06 The Engineer's review of drawings and data submitted by the Contractor will cover only general conformity to the drawings and specifications, external connections and dimensions which affect the layout. The Engineer's review of drawings returned marked "APPROVED" or "APPROVED AS NOTED" does not indicate a thorough review of all dimensions, quantities and details of the material, equipment, device or item shown and shall not in any way be deemed to relieve the Contractor from any responsibility for errors or deviations from the requirements of these contract documents, or from any liability placed upon him by any provisions of these contract documents.

3.07 All drawings and data, after final processing by the Engineer, shall become a part of these contract documents and the work shown or described thereby shall be performed in conformity therewith unless otherwise authorized by the Owner or the Engineer.

END OF SECTION

SECTION 02300

CONSTRUCTION QUALITY CONTROL

PART 1 - GENERAL

1.01 Contractor shall be responsible for furnishing documentation which certifies that designs and all materials meet the requirements of the Contract Documents.

1.02 Contractor shall cooperate with inspection/laboratory personnel to provide access to work and to Contractor's operation and shall notify Engineer sufficiently in advance of operations to allow for his assignment of inspection/laboratory personnel and scheduling of tests.

END OF SECTION

SECTION 02400

CONSTRUCTION SURVEYS

PART 1 - GENERAL

1.01 The Engineer will set control points for work to be performed as he deems necessary. The Contractor will be furnished with all necessary information relating to these control points. The Contractor will be required to maintain control points and set all necessary construction stakes to complete construction according to plans and specifications. The Contractor will also be required to check all the controlling dimensions and clearances measured from the control points and thereafter become responsible for alignment, elevation, and dimensions of all parts of the work and their mutual agreement.

1.02 The Contractor shall be held responsible for the preservation of all stakes and marks, and if any of the construction stakes or marks have been carelessly or willfully destroyed or disturbed by the Contractor, the cost of replacing them will be the Contractor's responsibility.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.01 Layout of all facilities will be tied into the site coordinate system. Horizontal layout will consist of a closed loop (either on itself or to a known coordinate point) with an error of closure not greater than 1:1000. Level surveys and cross-section surveys will begin and be tied back into established benchmarks. Turning points should be solid objects with readings taken to the nearest 0.01 ft. Error of closure of level surveys should not exceed 0.03 ft. Individual elevation shots or cross-sections will be reported to the nearest 0.1 ft. or 6 ss.

3.02 All survey data will be recorded in standard field books. Notes shall include date, section surveyed, weather conditions and names of members of survey party. Surveys will be plotted when necessary to determine quantities.

3.03 The Contractor shall assist the Engineer in preparation of a final "as-built" mark-up drawing showing final elevation and location of all improvements.

END OF SECTION

SECTION 02484

TOPSOILING

PART 1 - GENERAL

DESCRIPTION: This work shall consist of furnishing if specified, excavating, stockpiling if necessary, transporting, spreading, compacting, and finishing topsoil as specified or directed.

PART 2 - PRODUCTS

2.01 Topsoil shall be a well-graded soil of good uniform quality, without detrimental admixture of subsoil, refuse, or foreign material and reasonably free of hard clods, stones, cement, brick, slag, concrete, sticks, or other undesirable materials harmful to plant life.

2.02 When indicated in the contract, topsoil shall be salvaged from within the construction limits. The topsoil shall be removed only from areas and to depths designated by the Engineer.

2.03 ON-SITE MATERIALS:

A. Areas from which topsoil is to be obtained shall be mowed and cleared of foreign materials to the satisfaction of the Engineer.

B. The approved area shall be excavated neither deeper than the limits of good topsoil nor than necessary to produce sufficient volume to cover the designated areas.

C. If strats or seams of unsuitable material are encountered during the excavation of topsoil, the material shall be removed from the topsoil. If considered necessary, the area shall be abandoned and satisfactory material produced from other sources.

D. Topsoil shall either be transported or stockpiled on well drained areas approved by the Engineer, or transported, deposited, and processed directly on designated areas which have been finished, prepared, and approved to receive the topsoil. The Contractor shall spread or dispose of, as directed, all surplus material left in stockpiles without cost to the Owner.

2.04 OFF-SITE MATERIALS:

A. Before mining the material, approved areas shall be mowed and raked and cleared of foreign materials to the satisfaction of the Engineer.

B. Approval of a pit will, in general, constitute acceptance of the material as meeting the requirements of the specifications, provided:

1. Mining of the material is confined to horizontal and vertical limits specified, and the mining is performed in an approved manner.

2. When previously approved excavation limits or mining methods result in the production of unsatisfactory material, mining shall be halted until corrective measures are taken to assure production of satisfactory material.

3. The inability to maintain a normal, approved mining operation in a given pit will be cause for abandonment of that pit.

C. It is intended that approved mining operations shall include the mixing or blending of materials that will insure a homogeneous mixture complying with the requirements of the contract.

D. For pits proposed by the Contractor, the Contractor shall obtain and submit for testing representative samples taken at places designated by and witnessed by the Engineer or his representative. If deemed advisable, the Engineer may take the samples, and the Contractor shall furnish the assistance required. Based on test results, the Engineer will approve lateral and depth limits of satisfactory materials.

E. The Engineer may, at his discretion, sample the material at any point prior to spreading on the road. This sampling and testing will be for the purpose of determining whether or not corrective measures should be taken.

F. Material produced and approved as provided herein, will be accepted as meeting all requirements at the point of final loading for delivery and incorporation into the work.

G. Approved topsoil, mined as prescribed, shall be transported and deposited and processed directly into its final position on designated areas which have been finished, prepared, and approved unless temporary stockpiling is required or permitted by the Engineer. In case stockpiling is required or permitted, the Contractor shall spread or dispose of, as directed, surplus material left in the stockpile without cost to the Owner.

PART 3 - EXECUTION

3.01 The conditioning of areas to be plated will depend on the type of existing soil as cut slopes or fill slopes. Conditioning shall be performed so as to secure a bond between the existing soil and the topsoil. Unless otherwise directed, the area to be plated shall be shaped and dressed to the required line, grade, and typical section; disk-harrowed to a depth of at least two inches; and be reasonably free of large clods and stones (exceeding three inches in diameter) and other foreign materials before topsoil is deposited. On non-tillable slopes, the areas shall be shaped and dressed to the required section, and the Contractor shall cut trenches or burrows approximately six inches deep and approximately 24 to 36 inches apart, as directed by the Engineer dependent upon the steepness of the slope, and on approximate contours. Surplus material from trenching shall be uniformly spread over the area to be plated or otherwise

disposed of in a satisfactory manner. In no case shall topsoil be placed on slopes until conditioning of the areas has been approved.

3.02 It is intended that the application and incorporation of fertilizer, and other erosion control work will constitute continuous construction, and the Contractor shall so organize his overall operation accordingly. When the Engineer has determined that the Contractor has made suitable arrangements to carry out these operations as indicated, topsoil shall be deposited on approved areas and spread to the required depth and section. When

the required depth of plating material exceeds eight inches, it shall be placed in two or more approximately equal layers of no more than eight inches each.

3.03 After spreading and shaping of the topsoil, compaction shall be performed to the degree that will provide a firm layer having a density of at least what might be expected from one complete coverage of a crawler type tractor track while the material is at a satisfactory moisture content.

3.04 COMPACTED DEPTH OF TOPSOIL:

A. Topsoil shall be deposited and spread in sufficient quantity so that when compacted it will have the depth specified in the contract.

B. Determination of depth will be made at random and recorded following compaction of each plated area (lot) of approximately 20,000 square feet and more often if determined by the Engineer to be necessary to control the specified depth. The depth of each lot checked will be the average of at least two and not more than four measurements taken within a square yard area. Except as provided in the following two paragraphs, the average depth of each lot shall vary from the specified depth by more than one inch or twenty-five (25) percent of the specified depth, whichever is larger. The average depth of the entire area topsoiled (the average of the depths of the individual lots) shall not vary from the specified depth by more than one inch.

C. Topsoil measured and paid for on a cubic yard basis may exceed the stated plus tolerances, provided the finished surface is uniform, does not obstruct drainage, and otherwise meets the approval of the Engineer.

D. Topsoil specified to be measured and paid for on a square yard basis may exceed the stated plus tolerance and remain in place provided the finished surface is uniform, does not obstruct drainage, and otherwise will be made for the excessive material placed. The removal of excessive topsoil shall be at the election of the Contractor at his expense.

SECTION 02500

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 shall also include all mobilization pre-construction costs which are necessary direct costs to the project and are of a general nature rather than directly attributable to other pay items.

PART 2 - PAYMENT

2.01 METHOD OF MEASUREMENT: Measurement for payment will be in accordance with the following schedule:

When five percent of the original contract amount is earned from other bid items, fifty (50) percent of the amount bid for mobilization, or five percent of the original contract amount, whichever is lesser, will be paid.

8. When ten (10) percent of the original contract amount is earned from other bid items, one hundred (100) percent of the amount bid for mobilization, or ten (10) percent of the original contract amount, whichever is lesser, will be paid.

9. Upon completion of all work, payment of any amount bid for mobilization in excess of ten (10) percent of the original contract amount will be paid.

Mobilization shall be paid for under the contract lump sum price, which shall be full compensation for completing the work specified.

END OF SECTION

SECTION 02920

SEEDING, FERTILIZING, AND MULCHING

PART 1 - GENERAL

SCOPE: This Section covers all operations in connection with seeding, fertilizing, and mulching the areas disturbed by the construction activities.

PART 2 - PRODUCTS

2.01 Seeds shall be uniform mixtures of the following kinds and properties:

KIND	GROUP 1 Pounds Per Acre	GROUP 2 Pounds Per Acre	GROUP 3 Pounds Per Acre
Common Bermuda	15	--	--
Bahiagrass	40	40	40
Crimson Clover	--	20	10
Common Bermuda (unhulled)	--	15	25
Winter Rye (Marshall)	--	--	20

2.02 Fertilizer shall be 13-13-13 commercial grade type.

2.03 Mulch shall consist of locally available weed-free strain.

PART 3 - EXECUTION

3.01 APPLICATION:

A. Seed, mulch, and fertilize all areas disturbed by construction operations, except those areas to be surfaced with clay gravel, limestone, concrete, asphalt , or solid sod.

B. Before fertilizing and seeding, clear all ground surfaces of stones, trash, weeds, construction materials, and other material which could interfere with the seeding, grass growth, and future grass maintenance.

C. Before seeding, apply 30 pounds per 1000 square feet of fertilizer and incorporate it uniformly into the soil at least 3 inches deep by discing and harrowing.

D. Times of sowing and seed mixtures required are as follows:

1. March 1 to August 31: Use Group 1 only.
2. September 1 to November 15: Use Group 2 only.
3. November 16 to February 28: Use Group 3 only.

E. All seeds shall be covered lightly with soil by raking, rolling, or other approved methods, and the area compacted with a cultipacker.

F. Cover the seeded areas specified with a layer of weed-free straw at the rate of 2 tons per acre.

G. Water and maintain the seeding, sodding, and sprigging until satisfactory grass growth has been established, and at least until final project acceptance.

H. On a Project involving a building or similar structure, the contractor shall provide a blanket of weed-free straw mulch around the perimeter of the building and extending 6 feet from the perimeter within 48 hours of finishing exterior walls. Contractor shall maintain the straw bed until the project is complete or permanent vegetation is established.

3.02 EROSION CONTROL APPLICATION RATES:

	ITEM	RATE
	Agricultural Limestone	2 Tons/Acre
	Commercial Fertilizer (13-13-13)	0.5 Tons/Acre
*	Ammonium Nitrate	0.2 Tons/Acre
	Vegetative Materials for Mulch	2 Tons/Acre

* Apply after growth of vegetation is established.

SECTION 03200

EARTHWORK

PART 1 – GENERAL

1.01 SCOPE: This item shall consist of furnishing all labor, equipment, tools, and incidentals, and performing all earthwork including excavation, clearing, grubbing, stripping, scarifying, borrow, haul, placing, compacting, shaping, disposal of unsatisfactory materials, and other work incidental to a complete job in accordance with these specifications, the contract drawings, and directions of the Engineer.

1.02 QUALITY ASSURANCE: Test on soil for controlled fill shall be performed by an independent testing laboratory employed by the Contractor.

1.03 SUBMITTALS: Testing laboratory reports that material for controlled fill meets requirements of this section.

PART 2 – PRODUCTS

2.01 MATERIAL FOR CONTROLLED FILL:

A. Material for sub-grade and slopes construction shall meet requirements of Section 3.02 of this specification.

B. Material for base beneath roadway, sidewalks, and yard shall be granular material (Class 5, Group C).

2.02 All brush, grass, shrubs, vines, logs, uprooted stumps, or cut or fallen trees, or organic or other deleterious material within the area established on the plans for construction, shall be removed from the site or burned to the satisfaction of the Engineer. All trees that will interfere with the proposed construction shall be removed to a depth of 2 feet below the proposed finished grade. Owner will flag (orange) trees that remain.

2.03 In general, the entire area shall be kept in reasonably tidy condition throughout the period of construction.

2.04 All holes made by clearing operations shall be filled with clean material suitable to the Resident Engineer and compacted to a density approximately that of the adjacent undisturbed ground.

2.05 CLASSIFICATION OF EXCAVATION

A. Unclassified Excavation: Unclassified excavation will consist of all excavation materials of whatever character encountered (including existing slag and ballast) in the work except for those classes of excavation for which separate pay items are provided.

B. Undercut Excavation: Undercut excavation shall consist of the removal of deposits of soils and organic matter not suitable for foundation or subgrade material as determined by the Engineer and satisfactorily disposing of materials off-site at a site to be furnished by the Contractor.

Undercut excavation shall include materials which will decay or produce unsatisfactory subsidence in the embankment, pipe or structural bedding. Undercut excavation may be made up of decaying stumps, roots, logs, humus, highly plastic clay (CH), or other unsatisfactory material.

C. Channel and Ditch Excavation: Excavation of drainage ways shall consist of excavating all earthen materials and shaping the channel to the neat lines, grades and typical sections required for the various type sections of channel improvements proposed. Channel and ditch excavation shall include the hauling, spreading, placing, processing, compacting, or disposal of all excavated material.

Channel excavation shall be that required to improve or relocate existing channels.

Ditch excavation shall be that required to construct upstream and downstream channels for pipe culverts or for the excavation of drainage swales.

D. Borrow Excavation: Borrow excavation shall consist of the removal, hauling, placing, processing, shaping, and compacting of approved select off-site material at any location shown on the Drawings or directed by the Engineer.

E. Structure Excavation: Structure excavation shall consist of the removal of all material to the dimensions and depths shown on the Plans, or as directed by the Engineer, necessary for the construction of structures and the installation of other items. It shall also include, as necessary, all pumping, bailing, drainage, cribbing, sheeting and other foundation work; and should include backfilling and the proper disposal of all excavated material as directed.

F. Rock Excavation: When shown as a pay item, rock excavation will consist of material which cannot be excavated without blasting and shall also include large boulders and detached stones having volumes of one-half cubic yard or more. The use of the words “rock”, “boulders”, “stone”, or synonyms of these words appearing elsewhere on the plans, soil profile of these specifications does not imply that these materials may be included under this classification unless so indicated in the contract proposal.

The Contractor shall immediately notify the Engineer when rock excavation is encountered during the progress of the work so the necessary measurements may be made for determining the volume removed.

SECTION 03200

EARTHWORK

PART 3 – EXECUTION

3.01 EXCAVATION:

A. Excavate to the dimensions, shapes, and elevations as indicated and as required, by machine work, hand work, or a combination thereof. Do all exaction in an orderly and skillful manner an according to an approved schedule. Base all elevations, grades, and layouts upon bench marks and control points designated by the ENGINEER.

B. All topsoil shall be stripped from the area within the construction limits and stockpiled for use in dressing out slopes before seeding.

C. All excavations shall be made to proper depth and correct line, with sufficient allowance for correct forming, shoring, and inspection of foundation work. Pouring of concrete against earth side walls will not be permitted.

D. Rough excavation must be stopped at least 3" from finished grade; fine excavation and dressing must be done by hand to the required depth.

E. Before any foundations are placed on natural soils, the surface soils on which concrete will be placed shall be compacted with a vibratory compactor. The material to a depth of 2 feet below bottom of slab shall have a 95% standard AASHTO maximum dry density at or near optimum water content.

F. Excavation under structures shall be at least two feet below the subgrade elevations shown on the plans.

G. The Contractor shall provide, operate, and maintain all necessary pumps, discharge lines, well points, etc., in sufficient number and capacity to keep all excavation, bases, pits, tanks, etc., free from seepage, sanding, or running water at all times throughout the period of construction.

H. A loaded tandem-axle dump truck or similar pneumatic tired equipment with a minimum weight of 15 tons and a maximum weight of 25 tons should be used to "PROOF" roll the exposed sub-grade prior to placing fill or construction of foundations.

I. The Contractors shall assume all responsibility for security of the excavation required, employing bracing, lining, or other accepted means necessary to accomplish same.

J. Satisfactory material removed from excavations shall be used in the construct of fills, embankments and for similar purposes. No satisfactory excavated material shall be wasted without specific written authorization. Coarse rock from excavations shall be stockpiled and used for construction slopes or embankments

adjacent to streams, or sides and bottoms of channels and for protecting against erosion. No excavated material shall be disposed of in such a manner as to obstruct the flow of any stream, endanger a partly finished structure, impair the efficiency or appearance of any structure, or be detrimental to the completed work in any way.

K. All ditching shall be cut to line, grade, and dimensions as required.

L. The final exterior grade shall be dressed to easy contours.

3.02 FILLING AND BACKFILLING: Areas to be filled and on which structures will subsequently be constructed, as shown on plans, shall be filled as described in 3.02A below. Areas to be filled and on which structures will not be constructed shall be filled as described in 3.02B below. Backfill around structures and foundations shall be as described in 3.02C below.

A. Fill Under Structures: Backfill material shall consist of silty sands (SM) or clayey sands (SC) having a liquid limit of not more than 35 and a plasticity index within a range of 3 to 15.

1. Laboratory tests shall be performed on the backfill material and submitted to the Engineer for approval. Laboratory tests shall include:

   - Grain Size Analysis
   - Atterberg Limits
   - Field Density Tests

2. All tests shall conform to the latest methods as described in publications of the American Society for Testing and Materials (ASTM) and the American Association of State Highway & Transportation Officials (AASHTO).

3. The fill material shall be compacted with either a rubber-tired (eccentric-type) or sheep's-foot roller, whichever is appropriate. A vibrating compactor shall not be used for compacting the backfill under structures. The compaction equipment used must be approved by the Engineer.

4. The fill material shall be compacted in thin lifts not exceeding nine (9) inches in loose measure to a density which is equal to at least 95% of the Standard Proctor Density (ASTM D 698) for the material selected at moisture contents within 3 percentage points of the optimum moisture content.

5. Mechanical hand tamping will be allowed in areas which are inaccessible to the above method; however, 95% Standard Proctor Density shall be obtained at lifts not exceeding 5 inches.

6. Field Density tests shall be performed on each lift to ensure that proper compaction has been achieved. Subsequent lifts shall not be made until approval from the Engineer has been received.

B. Fill Outside Structure Limits:

1. All fill may be excavated earth, free from debris and foreign matter such as stumps, roots, etc.

2. Fill in this class shall be placed in layers not to exceed nine (9) inches in thickness (loose) and shall be compacted to a 95% Standard AASHTO maximum dry density at or near optimum water content.

C. Backfill:

1. Contractor shall backfill all sub-grade excavations immediately after Engineer's approval of work to be covered. Contractor shall securely tamp the backfilling with pneumatic rammer around all walls and piers. No backfilling or filling shall be done without approval of the Engineer, especially in the case of concrete walls sustaining earth pressure.

2. Surplus material resulting from the prosecution of excavation and backfill shall be used in grading the site as directed by the Engineer, but in no case shall it be placed in adjacent lands. Fill shall be placed in layers not exceeding 12" in depth and shall be compacted with bulldozers, or approved means.

D. Lagoon Backfill:

1. Backfill material shall be excavated earth, free from debris and foreign matter such as stumps, roots, etc.

2. Lagoon backfill shall be placed in layers not exceeding 12" in depth and compacted. The compaction shall be performed to the degree that will provide a firm layer having a density of at least what might be expected from one complete coverage of a bulldozer track, while the material is at a satisfactory moisture content.

3.03 GRANULAR SURFACE MATERIAL: Spread the granular material where required, as indicated on the drawings and as specified by the Engineer. Construction shall conform to Section S-304 of the Mississippi Standard Specifications for State Aid Road and Bridge Construction. Material shall be compacted to at least 100% of Standard Proctor (AASHTO T-99 and ASTM D-698) Density.

3.04 DISPOSAL OF UNSUITABLE AND SURPLUS MATERIALS:

A. Any material encountered which, in the opinion of the Engineer, is unsuitable for use in the work, shall be removed and disposed of as directed. No excavation shall be wasted without permission of the Engineer. Surplus excavation shall be disposed of as directed, some in uniformly widening embankments or flattening slopes. Waste excavation shall be left presenting a neat appearance and well drained. Excavation material in excess of on-the-site requirements shall be hauled and deposited at a site provided by the Contractor. All excess materials shall be graded to a pleasing appearance and shall be smoothed suitable for mowing.

B. Soils from ditch excavation shall be spread and leveled to blend with the ground contours and as to present a well-drained, pleasing appearance.

3.05 FINISH GRADING:

A. Contractor will control grading to prevent water drainage into excavated areas of project or from damaging other structures.

B. Contractor shall insure drainage away from all buildings and other structures.

C. The finished surfaces shall be reasonably smooth and compacted to a density previously specified.

D. The degree of finish shall be that ordinarily obtainable from motor grader operations, except as otherwise specified.

E. The surface of areas on which pavement is to be placed shall not vary more than 0.05 feet from the established grade.

F. Finish grading around structures shall be as directed by the Engineer for a neat and uniform appearance and proper coverage of the edges of the structure foundation.

END OF SECTION 02300

SECTION 03210

EXCAVATION, TRENCHING, AND BACKFILLING

PART 1 - GENERAL

1.01 SCOPE: This section covers the excavation, trenching, and backfilling for utilities and appurtenances.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

A. Section 02510 – Water Distribution

1.03 APPLICABLE PUBLICATIONS: Where reference is made to other publications, they are referred to by basic designation only and form a part of this specification to the extent indicated by reference thereto. All referenced publications shall be the latest issue, including amendments as of the date of this specification.

1.04 Contractor shall be responsible for locating all existing utilities within area to be excavated and/or trenched whether indicated on plans or not. Contractor at his sole cost and expense, will be responsible for repairing and/or replacing any damaged equipment and/or facilities caused by excavating and/or trenching.

1.05 Prior to excavation and/or trenching for underground utilities and/or appurtenances contractor shall stake all locations and seek professional's approval of these locations. Professional must be given 48 hours notice prior to inspection. The professional may make minor adjustments to indicate locations prior to excavation at no additional cost to owner.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.01 EXCAVATION:

All excavation of every description and of whatever substances encountered shall be performed to the depths indicated or as otherwise specified. During excavation, material suitable for backfilling shall be piled in an orderly manner a sufficient distance from the banks of the trench to avoid over-loading and to prevent slides or cave-ins. All excavated materials not required or suitable for backfill shall be removed and disposed of off site at the CONTRACTOR's expense. Grading shall be done as necessary to prevent surface water from flowing into trenches or other excavations, and any water accumulating therein shall be removed by pumping or by other approved methods. Sheeting and shoring shall be done as necessary for the protection of the work and for the safety of personnel. Excavation shall comprise all materials encountered, including rock and filled-in material of whatever nature is involved.

A. The utilities shall be laid and maintained to lines and grades established by the plans and specifications with fittings at the required locations unless otherwise approved by the OWNER.

B. Prior to excavation, investigation shall be made to the extent necessary to determine the location of existing underground structures and conflicts. Care should be exercised by the CONTRACTOR during excavation to avoid damage to existing structures.

C. When obstructions that are not shown on the plans are encountered during the progress of work and interfere so that an alteration of the plans is required, the PROFESSIONAL will alter the plans or order a deviation in line and grade or arrange for removal, relocation, or reconstruction of the obstructions.

D. When crossing existing pipelines or other structures, alignment and grade shall be adjusted as necessary, with the approval of the PROFESSIONAL, to provide clearance as required by federal, state, or local regulations or as deemed necessary by the ENGINEER to prevent future damage or contamination of either structure.

E. Contractor responsible for coordinating and obtaining necessary permits, licenses, and fees associated with local utility company.

3.02 TRENCHING:

A. General:

1. Trench preparation shall proceed in advance of pipe installation for only as far as the pipe installation can be completed and backfilled within 24 hours.

2. The Contractor shall be responsible for all work associated with dewatering. Discharge from any trench dewatering pumps shall be conducted to natural drainage channels, storm sewers, or an approved reservoir.

3. Excavated material shall be placed in a manner that will not obstruct sidewalks, drive-ways, or other structures and shall be done in compliance with federal, state, or local regulations.

4. Removal of pavement and road surfaces shall be a part of the trench excavation and the amount removed shall depend upon the width of trench required for the installation of structures. The dimensions of pavement removed shall not exceed the dimensions of the opening required for installation of pipe and other structures by more than 6 inches in any direction unless required or approved by the OWNER. Methods, such as sawing, drilling, or chipping, shall be used to ensure the breakage of pavement along straight lines. In all areas where the trench will be backfilled

with natural material the cut pavement shall be separated from the backfill material and disposed of by the Contractor.

5. The width of the trench at the top of the pipe shall be that of the single-pass capabilities of normally available excavating equipment and ample to permit the pipe to be laid and joined properly and allow the backfill to be placed as specified. Trench widths at the top of the trench shall be no greater than the normal diameter of the pipe plus 24 inches. Trenches shall be of such extra width, when required, to permit the placement of timber supports, sheeting, bracing, and appurtenances.

6. When excavation of rock is encountered, all rock shall be removed to provide a clearance of at least 9 inches below and on each side of all pipe and fittings. When excavation is completed, a bed of sand, crushed stone, or earth that is free from stones, large clods, or frozen earth, shall be placed on the bottom of the trench to the previously mentioned depths, leveled, and tamped. These clearances and bedding procedures shall also be observed for pieces of concrete or masonry and other debris or subterranean structures, such as masonry walls, piers, or foundations that may be encountered during excavation. This installation procedure shall be followed when gravel formations containing loose boulders greater than 8 inches in diameter are encountered. In all cases, the specified clearances shall be maintained between the bottom of all pipe and appurtenances and any part, projection, or point of rock, boulder, or stones of sufficient size and placement which, in the opinion of the ENGINEER, could cause a fulcrum point.

7. Should the trench pass over a sewer or other previous excavation, the trench bottom shall be sufficiently compacted to provide support equal to that of the native soil or conform to other regulatory requirements in a manner that will prevent damage to the existing installation.

8. Trees, shrubs, fences, and all other property and surface structures shall be protected during construction unless their removal is shown in the plans and specifications or approved by the OWNER. Any cutting of tree roots or branches shall be done only as approved by the OWNER.

9. Temporary support, adequate protection, and maintenance of all underground and surface structures, drains, sewers, and other obstructions encountered in the progress of the work shall be furnished by the CONTRACTOR. All properties that have been disturbed shall be restored as nearly as practical to their original condition.

10. Appropriate traffic control devices shall be provided in accordance with federal, state, or local regulations to regulate, warn, and guide traffic at the work site.

11. When the sub-grade is found to be unstable or to include ashes, cinders, refuse, organic material, or other unsuitable material, such material shall be removed, to a minimum of at least 12 inches, or to the depth ordered by the PROFESSIONAL and replaced under the directions of the PROFESSIONAL with clean stable back-fill material.

12. When the bottom of the trench or the sub-grade is found to consist of material that is unstable to such a degree that, in the judgment of the PROFESSIONAL it cannot be removed, a foundation for the conduit and or appurtenance shall be constructed using piling, timber, concrete, or other materials at the direction of the PROFESSIONAL.

B. Trenching - New gravity flow sewer line: The following procedures shall be used in areas in which new gravity flow sewer lines are to be constructed.

1. The trench shall be excavated to the required alignment, depth, and width and in conformance with all federal, state, and local regulations for the protection of the workmen.

2. Holes for the bells shall be provided at each joint but shall be no larger than necessary for joint assembly and assurance that the pipe barrel will lie flat on the trench bottom. Other than noted previously, the trench bottom shall be true and even in order to provide support for the full length of the pipe barrel, except that a slight depression may be provided to allow withdrawal of pipe slings or other lifting tackle.

3. When the subgrade is found to be unstable or to include ashes, cinders, refuse, organic material, or other unsuitable material, such material shall be removed, to a minimum of at least 12 inches, or to the depth ordered by the PROFESSIONAL and replaced under the directions of the PROFESSIONAL with clean, stable backfill material. The bedding shall be consolidated and leveled in order that the pipe may be installed properly.

4. When the bottom of the trench or the subgrade is found to consist of material that is unstable to such a degree that, in the judgement of the PROFESSIONAL it cannot be removed, a foundation for the pipe and/or appurtenance shall be constructed using piling, timber, concrete, or other materials at the direction of the PROFESSIONAL.

3.03 BACKFILLING:

A. General:

1. The trenches shall not be backfilled until they, as installed, conform to the requirements specified. Where, in the opinion of the PROFESSIONAL, damage is likely to result from withdrawing sheeting, the sheeting shall be left in place. Except as otherwise specified for special conditions of over-depths, trenches shall be backfilled to the ground surface with material that is suitable for the compaction specified hereinafter. Trenches improperly backfilled shall be reopened to the depth required for proper compaction, then refilled and compacted as specified, or the condition shall be otherwise corrected as approved. The surface shall be restored to its original condition as near as practicable as hereinafter specified. Pavement, base course, and compacted subgrade disturbed by trenching operations shall be replaced in an acceptable manner with materials equal to the adjacent compacted subgrade, base course, and pavement for a minimum distance of 12 inches on each side of the trench.

B. Backfilling for Gravity Flow Sewers:

1. Backfilling covered in this Section includes all material extending from 12" above pipe tops to existing grade or paving subgrade (as applicable). Initial backfilling from pipe top to 12" above pipe top shall be as specified in Section 02530 – Gravity Flow Sanitary Sewer.

2. Under Road Beds: Under all road beds in which gravity flow sewers are to be laid the trenches shall be backfilled in six inch layers to 95 percent of maximum density as determined by AASHTO T180. Material shall be natural material free from any large stones or paving materials produced from street cutting operations placed and compacted as specified.
3. Under All Other Areas: All areas not under road beds in which gravity flow sewers are to be laid the trenches shall be backfilled with native material free from stones larger than 1 inch in any dimension and hard clods larger than 6 inches in any dimension. The backfill material shall be placed and compacted to the density of the adjacent soil.

C. Location Markers

1. Water: All buried water mains shall have a 12 Gauge continuous wire placed within one foot of any PVC water line. Buried water mains shall also have magnetic locator tape placed approximately one foot below the surface of the ground directly above the water main or service line installed. The locator tape shall be color coded blue in accordance with the “Uniform Color Code”

2. of the American Public Works Association and shall contain the legend "Water Line Below".

3. Electrical: All buried conduits and or underground electrical cables shall have a red or yellow Polyethylene "Caution Electrical Cable Buried Below" warning tape buried between the conduits and electrical cables and the surface of the ground providing a defense and warning against accidental dig-ins. APWA color guidelines shall be used for electrical power-lines. Tape shall be made of low density polyethylene and highly stretchable Tape shall be made of low density polyethylene and highly stretchable Tape shall be placed approximately 12 inches above conduits and or power cable nearest the surface of the ground.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 DESCRIPTION

A. Applicable provisions of Instructions to Bidders, General and Supplementary Conditions, govern work under this section.

B. Related Requirements Specified Elsewhere:

1. Section 02300: Earthwork

1.02 COORDINATION WITH OTHER TRADES

A. Cooperate in placement of materials with other trades so that required areas of work will be scheduled properly.
B. Coordinate with other trades in placement of items set in concrete and required for project completion.

1.03 REFERENCE STANDARDS

A. ACI Manual of Concrete Inspection (report of committee 6-11, 1961) and accompanying references, latest edition.
B. Building Code Requirements for Reinforced Concrete (ACI 318-71)
C. Specifications for Structural Concrete for Buildings (ACI 301-72) (revised 1981)
D. Standard Specifications for Ready-Mixed Concrete (ASTM C-94)
E. American Society for Testing and Materials (ASTM)
F. Concrete Reinforcing Steel Institute (CRSI)
G. National Ready Mixed Concrete Association (NRMCA)
H. Southern Standard Building Code (SSBC)

1.04 TESTING AND INSPECTION

A. Access to project: Engineer and Testing Laboratory to have free access to project where materials are being stored proportioned, and deposited.

B. Testing Laboratory to provide following services: ASTM E329-72

1. Test Portland Cement, one for each carload or faction thereof, if requested.

2. Test coarse and fine aggregates.

3. Design and test all mixes (admixtures included) as established by Contractor; slump test, air content test: ASTM C192 and C-39.

4. Test a set of at least 4 cylinders for each class of concrete and each days pour and for each 100 cubic yards or fraction thereof each day.

    a. Cylinders shall be cured and tested in accordance with ASTM C31 and C39
    b. Two cylinders tested at 7 days
    c. Second two cylinders tested at 28 days
    d. If first three cylinders give low breaks, fourth cylinder shall be held for longer period as directed by Engineer.

5. Furnish test results to Contractor and Engineer:

    a. Furnish reports, giving date, location and yardage of pour, specific materials, proportions, consistencies, and class of concrete, test cylinder numbers representing pour, prevailing weather conditions.

C. Storage of Test Cylinders: Furnish protected space for storage of field cylinders which approximates the condition of curing of concrete being sampled.

D. Enforcement of Strength Requirements:

1. Should "Control" test cylinders fall below nominal strength necessary changes in design mix should be made.

2. Should "Field" test cylinders fall below nominal strength:

    a) Additional curing will be required
    b) Strength will be evaluated in accordance with ASTM C94, Section 15(d)

3. Should above requirements not give required strength, or in other case where due to faulty workmanship:

    a) Load tests conforming to Chapter 4 of A.C.I. building code 318-77 will be required.

4. Should above requirements show strength to be inadequate:

    a) Strengthening or replacement will be required, per Engineer's direction, at Contractor's expense.

5. Should slump and air-content test fall below minimum notify Engineer. Do not pour concrete until Engineer so approves.

1.05 ENVIRONMENTAL CONDITIONS

A. Do not start or continue pour during rain or snow:

1. Pour to suitable cut-off point after start of inclement weather.

2. Increase cement content placed during rain by one sack per cubic yard

B. Place concrete in temperatures 40 degrees F and above unless otherwise approved.

C. Maintain minimum concrete temperature of 50 degrees F for 72 hours after completing pour.

PART 2 - PRODUCTS

2.01 CONCRETE MATERIALS

A. Concrete: Ready mixed type conforming to ASTM C94.

B. Portland Cement: ASTM C150 (Type 1 1A), passing 3 day test as indicated in ASTM specification.

C. Air Entrained Portland Cement: ASTM C175, passing 3 day test indicated in ASTM specification.

D. Lightweight Aggregates for Concrete: ASTM C330.

E. Coarse Aggregates: not larger than 1/5 narrowest dimension between forms, or slab thickness. Aggregate absorption shall not exceed five percent. No aggregate shall be larger than 1½".

F. Sand: Clean hard natural sand conforming to ASTM C33.

G. Water: clean, free from oil, and injurious amounts of acid, alkali, or organic matter.

2.02 FORMS

A. Conform to ACI 301.

B. Wood form materials shall be No. 2 common or better lumber, one-side plyform quality. Douglas fir or spruce plywood; sound undamaged sheets.

C. Steel Forms: Minimum 14 gage thick, stiffened to support weight of concrete with minimum deflection.

D. Construction: Forms shall have sufficient strength to carry safely the load of concrete with a construction live load of at least 50 pounds per square foot; be stiff enough to prevent any appreciable bulging, sagging or moving out of position; be tight enough to prevent any appreciable loss of mortar; and be arranged so that they can be safely and easily removed without damaging concrete. Construct and erect forms with the fewest practicable number of joints, and to insure straight, plumb, level, and smooth concrete surfaces with all angles sharp and true to line. Use form oil and wetting as required to accomplish these results.

E. Form ties: Provide suitable metal form ties of a type that no metal will be within one inch on finished concrete surfaces after form removal.

2.03 CONCRETE REINFORCING

A. Reinforcing steel bars: conform to ASTM A615, Grade 60, billet steel deformed bars; uncoated finish.

B. Ties and stirrups: conforming to ASTM A615, Grade 40 and bend requirements of ACI 318-77.

C. Welded wire fabric: conform to ASTM-185.

D. Accessories: Provide standard accessories for supporting, spacing, and tying concrete reinforcement, as recommended by the American Concrete Institute.

E. Fabricating and placing: Remove oil and loose scale from steel before placing it. Securely tie and support steel to prevent its displacement prior to and during concrete placement. At each bar splice, provide a wire-tied lap 18" or 30 bar diameters long, whichever is greater and stagger splices on adjacent bars. At each fabric splice, lap fabric at least one mesh.

2.04 ANCHOR BOLTS

A. Conform to ASTM A675, Grade 50. Anchor bolts shall be galvanized on all exposed surfaces in accordance with ASTM A153.

B. Set all anchor bolts by template, rigidly secure the bolts in place to prevent their displacement, and verify all bolt locations before placing concrete, so that the bolt locations in the completed foundations will conform accurately to the bolt setting dimensions indicated on the foundation drawings.

2.05 ACCESSORIES

A. Vapor Barrier: ASTM D2103, 6 mil thick clear polyethylene film.

B. Non-Shrink Grout: Premixed compound with non-metallic aggregate, cement, water reducing and plasticizing agents; capable of minimum compressive strength of 2400 psi.

C. Dovetail Anchor Slots: Minimum 22 gage thick galvanized steel; foam filled, release tapes; sealed slots; bent tab anchors.

D. Expansion Joints:

1. Asphalt impregnated fiberboard conforming to ASTM D1751-60T at interior, ASTM D1752-60T at exterior. Extend joints full depth of slab.

2. Permanent metal expansion joints shall be galvanized, 28 ga., equal to Wheeling Tensilform TF-50.

3. Seal joints with ½" x ½" Elastomeric Sealant

PART 3 - EXECUTION

3.01 INSPECTION AND PREPARATION

A. Clean area to be poured of debris, shavings, excessive sand or sawdust, tie wire, tags, etc.

B. Remove dirt, scale, etc. from reinforcing.

C. Check for alignment of forms, location spacing and anchorage of reinforcing

D. Check location, spacing, and anchorage of reinforcing.

E. Place no concrete until forming and reinforcement approved by Engineer. Notify Engineer a minimum of 48 hours prior to commencing concreting operations.

F. Place no concrete until representative of Testing Laboratory is consulted.

G. Begin no pour until all equipment (vibrators, chutes, walkboards, tremies, etc.) required is on site and checked for operation, and until finishing crew and equipment are on site.

3.02 QUALITY AND PROPORTIONING

A. Contractor responsible to design, furnish concrete which will conform to those specified.

B. Concrete Proportioning:

1. Minimum allowable compressive strength at 28 days: **3500** psi

2. Maximum allowable water per sack of cement:

a) Non-air entrained: 6½
b) Air-entrained: 5¼

3. Slump, range in inches: 3 to 5

4. Minimum sacks of cement per cubic yard: **6**

5. Water reducing agent (ounces per 100 lbs. of cement): 4

6. Fly Ash may be used as a partial substitution for Portland Cement in an amount not greater than 25% (by weight) of cement in the concrete mix.

C. Admixture Proportions:

1. Calcium Chloride shall not be used

2. Air entraining agent complying with ASTM C260 added accurately to produce entrained air 3-5 percent by volume in all concrete exposed to the weather. Vary admixture as required to produce satisfactory concrete.

D. Measurement of Materials:

1. Cement measured by half-sack unless cement is weighed for each batch.

2. Aggregates proportioned separately by weight with proper compensation for moisture.

3. Water measured by device capable of accurate measurement of one pint.

3.03 MIXING CONCRETE

A. General: Mix concrete by ready-mix or job-mix, at Contractor's option.

B. Measure accurately material, thoroughly mix by machine. Mix materials dry; adding water by measurement.

C. Ready-Mixed Concrete: mixed and delivered to project in accordance with ASTM C94.

D. Concrete shall be mixed with an amount of water as will leave concrete free of standing water on top of slab in forms.

E. Consistency: Range in slump for concrete shall be 3 to 5 inches.

3.04 DEPOSITING CONCRETE

A. Preparation: Prior to concrete placement remove debris, water, ice from spaces in which concrete is to be poured.

B. Inspection: Do not place concrete until inspection and approval of Engineer.

C. Placement: Deposit concrete rapidly from mixer to forms by methods which will prevent segregation of materials and loss of ingredients. Work concrete into corners and surfaces of forms by hand to assure close contact:

1. Maintain location of reinforcement while pouring

2. Work material around steel, into corners and recesses; compact with mechanical vibrator to fill all void spaces.

3. Deposit each successive batch in one continuous layer by a continuous operation. Do not under any circumstances place any concrete which has taken initial set.

4. Deposit concrete as near as practical to its final position, in layers at such a rate that at all times during placing, concrete will be plastic; no pouring planes will occur; and no thin sheets of concrete will adhere and harden on reinforcing and other embedded items before they are embedded in final concrete body.

D. Time: Ready-mixed concrete in agitator truck shall be deposited within one and one-half hours time from mixer.

E. Compaction and Vibration: thoroughly compact deposited concrete around reinforcing, embedded fixtures, and into all part of forms and footings. Use mechanical vibrators where necessary. Take precautions not to work concrete to the point of segregation.

F. Do not cast any large stones, bricks, or pieces of previously hardened concrete into concrete work. Do not place any concrete on frozen ground, mud, topsoil, or other unsuitable material.

G. Top surface of each pier foundation shall be a level plane and finished top elevations shall not vary more than ¼" from these specified.

3.05 SLAB FINISHES

A. Smooth trowel finish at all interior slabs.

B. Light broom or belt finish at all exterior walks and slabs.

C. Abrasive stone rubbed smooth white finish on exposed above ground vertical surfaces.

3.06 CURING AND PROTECTION

A. Curing: (may be accomplished by one or more of the following methods, upon approval)

1. Surface remaining in contact with forms for 7 days or 75% of required compressive strength has been achieved.

2. Form and shoring removal shall be subject to on site inspector's prior approval. Remove forms carefully and prevent damage to exposed surfaces, corners, and angles. No steel spreader, tie wires, or other metal shall project or be visible on any concrete surface.

3. Cover surface with polyethylene film, burlap, or other approved coverings lapped 4" at all edges and joints;

4. Cover surface with 1 inch layer wet sand;

5. In lieu of water curing, coat floor slab with approved curing and hardening compound conforming to ASTM 309, applied in accordance with manufacturer's recommendations.

6. Apply water as required to keep forms and coverings saturated continuously throughout the curing period of at least 7 days

B. Cold Weather Requirements:

1. Provide adequate equipment for protection and hardening of concrete during freezing or near freezing weather.

2. Concrete to have temperature between 50 degrees and 90 degrees F. maintained for at least 72 hours.

3. No salt or chemicals to be used to prevent freezing.

4. Covering used for temporary protection shall remain in place 24 hours once artificial heat is discontinued.

C. Hot Weather Requirements:

1. When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305R-78 (Revised 1982) and as herein specified.

2. Hot weather is defined as air temperatures which exceed 90°F or any combination of high temperature, low humidity, and/or high wind velocity which causes a rate of evaporation in excess of 0.2 pounds per square foot per hour as determined by Figure 2.1.5 of ACI 305.

3. Concrete ingredients shall be cooled before mixing to prevent concrete placement temperatures from exceeding 90°F.

4. Provisions shall be made for ice, windbreaks, shading, fog spraying, sprinkling or wet cover when necessary.

5. Cure place concrete with wet burlap. Keep burlap constantly wet for 7 days minimum.

D. Admixtures intended to accelerate hardening not permitted unless prior approval is obtained from Engineer.

3.07 DEFECTIVE WORK

A. Remove concrete work when:

1. Not formed as indicated;

2. Beyond tolerances: ACI 347, Section 203, latest edition;

3. Not meeting specified strength;

4. Surface excessively defective in the opinion of the Engineer.

B. Patching:

1. Remove form ties, etc.

2. Cut back bulges, projections, honey combs to sound concrete, minimum one and one-half inch (1½").

3. Patch as soon as possible after removal of forms.

4. Clean area to be patched and apply approved bonding agent.

5. Patch with stiff mixture of sand and cement proportioned same as that used in pour, adding white cement as required to match surfaces adjacent to patched area. (Make sample batches to determine color requirements.)

6. Build large areas in one-quarter inch (¼") thick layers, allowing one hour set between layers, bulging last layer slightly, then finish flush with adjacent surfaces.

END OF SECTION 03300

SECTION 03310
EXPANSION AND CONSTRUCTION JOINTS

PART 1 - GENERAL

1.01 SCOPE

A. CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to provide concrete joints as shown and specified.

B. The types of concrete joints required include the following:

1. Construction joints

2. Expansion joints and fillers

3. Control joints

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03300 - Cast-in-Place Concrete

1.03 QUALITY ASSURANCE

A. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified:

1. ACI 301, "Specifications for Structural Concrete for Buildings", Chapter 6, Joints and Embedded Items.

2. ASTM D 1752, "Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction".

B. All manufactured items shall be installed in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.01 MATERIALS

A. For slabs on grade provide preformed expansion joint filler complying with ASTM D 1752, Type II, Cork.

B. For construction and contraction joints provide resin-impregnated fiberboard conforming to the requirements of ASTM D 1752.

C. Joint sealant shall be a self-leveling polyurethane sealant suitable for industrial Environments and equal to Sonomeric 1 as manufactured by BASF, The Chemical Company.

PART 3 - EXECUTION

3.01 LOCATION

A. In slabs on grade provide joints at a spacing of approximately 25 feet or as shown on the drawings. All joints shall be installed in accordance with ACI 301, Chapter 6.

B. Provide construction joints at all other locations required by the drawings including column footings and continuous footings.

C. Provide owner at completion of project with a spare case or five gallon container of joint sealer used on project.

END OF SECTION 03310

SECTION 04100

WATER DISTRIBUTION

PART 1 - GENERAL

1.01 SCOPE

A. Provide all materials, equipment, labor, etc. required to complete installation of the underground water distribution system specified herein and shown or scheduled on the plans, ready for operation, including all appurtenant structures and connections to all new and existing service lines and to the existing water supply.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03210 - EXCAVATION, TRENCHING AND BACKFILLING.

1.03 Information to be submitted to the ENGINEER for approval before items specified in this section are installed shall include the following:

A. A list and product literature describing and illustrating transition fittings to be used between different types and sizes of pipe and accessories.

B. Notice one week in advance in writing indicating the date pressure and leakage tests are to take place and when the piping is to be disinfected.

C. Manufacturers certificates of compliance or conformance which certify each pipe and pipe joint product to be used meets the specifications.

D. Manufacturers' literature describing and illustrating all pipe, fittings, valves, hydrants, boxes, corporation stops, and other items required by these specifications.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Proper implements, tools, and facilities shall be provided and used for the safe and convenient performance of the work. All pipe, fittings, valves and other appurtenances shall be lowered carefully into the trench by means of a derrick, ropes, or other suitable tools or equipment, in such a manner as to prevent damage to water-main materials and protective coatings and linings. Under no circumstances shall water-main materials be dropped or dumped into the trench. The trench shall be dewatered prior to installation of the pipe. Do not store any materials directly on the ground.

B. All pipe fittings, valves, and other appurtenances shall be examined carefully for damage and other defects immediately before installation. Defective materials shall be marked and held for inspection by the ENGINEER, who may prescribe corrective repairs or reject the materials.

C. All lumps, blisters, and excess coating shall be removed from the socket and plain ends of each pipe, and the outside of the plain end and the inside of the bell shall be wiped clean and dry and be free from dirt, sand, grit, or any foreign material before the pipe is installed.

D. Foreign material shall be prevented from entering the pipe while it is being placed in the trench. During laying operations, no debris, tools, clothing, or other materials shall be placed in the pipe.

E. As each length of pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.

F. At times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other means approved by the ENGINEER. When practical, the plug shall remain in place until the trench is pumped completely dry. Care must be taken to prevent pipe flotation should the trench fill with water.

G. Rubber gaskets that are not to be installed immediately shall be stored in a cool dark place.

H. No other pipe or material of any kind shall be placed inside of a pipe or fitting after the coating has been applied.

1.05 QUALITY ASSURANCE

A. PRODUCTS CRITERIA

1. When two or more units of the same type or class of materials or equipment are required, these units shall be products of one manufacturer.

2. A nameplate bearing the manufacturer's name or identifiable trademark shall be securely affixed in a conspicuous place on equipment or name or trademark shall be cast integrally with equipment or stamped or otherwise permanently marked on each item of equipment.

B. Comply with all regulations of the public utility authorities having jurisdiction in all cases where water lines are connected to public utility services.

1.06 APPLICABLE STANDARDS AND PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

B. American National Standards Institute (ANSI) Publications:

B16.26	Cast Copper Alloy Fittings for Flared Copper Tubes
B18.2.2	Square and Hex Nuts
B18.5	Round Head Bolts (Inch Series)

C. American Society for Testing and Materials (ASTM) Publications:

A 47	Malleable Iron Castings (ANSI/ASTM A47)
A 48	Gray Iron Castings (ANSI/ASTM A48)
A 307	Carbon Steel Externally Threaded Standard Fasteners (ANSI/ASTM A 307)
A 563	Carbon and Alloy Steel Nuts
A 61	Steam or Valve Bronze Castings (ANSI/ASTM B61)
B 62	Composition Bronze or Ounce Metal Castings
C 94	Ready-Mixed Concrete
C 150	Portland Cement
F 477	Elastomeric Seals (Gaskets) For Joining Plastic Pipe (ANSI/ASTM F477)

D. American Water Works Association (AWWA) Publications:

C104/A21.4	Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water(ANSI/AWWA C104/A21.4)
C110	Gray-Iron and Ductile-Iron Fittings, 3 in. Through 48 in., for Water and Other Liquids (ANSI A 21.10)
C111/A21.11	Rubber Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings (ANSI/AWWA C111/A21.11)
C151/21.51	Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids (ANSI/AWWA C151/A21.51)
C500	Gate Valves, 3 Inc. Through 48 in. NPS, for Water and Sewage Systems (ANSI/AWWA C500)
C502	Dry-Barrel Fire Hydrants (ANSI/AWWA C502)
C651-92	Disinfecting Water Mains (ANSI/AWWA C651-92)
C900	Polyvinyl Chloride (PVC) Pressure Pipe, 4” through 12” for Water

E. Underwriter's Laboratories, Inc. (UL) Publications:

UL 246	Hydrants for Fire-Protection Service, with revision dated January 4, 1982
UL 262	Gate Valves for Fire Protection Service

F. Uni-Bell Plastic Pipe Association (UNI) Publication:

UNI-B-3	Installation of Polyvinyl Chloride (PVC) Pressure Pipe Complying with AWWA Standard C-900

1.07 PERMITS

A. Owner shall be responsible for obtaining all information, permits, meters, deposits, etc. required for connection to Public Utility Systems.

PART 2 - PRODUCTS

2.01 POLYVINYL CHLORIDE (PVC) PIPING, APPURTENANCES AND ASSOCIATED FITTINGS

A. Pipe shall conform to AWWA C900 and shall be gasket bell end. Pressure Class 200 (SDR 21) with cast-iron-pipe-equivalent OD. All pipe must be stamped and approved by the NSF. Fittings shall be ductile-iron, mechanical-joint conforming to AWWA C110, and shall have cement-mortar lining conforming to AWWA C104/A21.4, standard thickness. Fittings shall have a rated water working pressure of 250 PSI.

B. Joints for pipe shall be integral bells containing elastomeric gaskets complying with the requirements of AWWA C-900, Section 2.2.2.2(a). Joints between pipe and metal fittings, valves, and other accessories shall be compression-type joints/mechanical-joints. Each joint connection shall be provided with an elastomeric gasket suitable for the bell or coupling with which it is to be used. Gaskets for push-on joints for pipe shall conform to ASTM F 477. Gaskets for push-on joints and compression-type joints/mechanical-joints for joint connections between pipe and metal fittings, valves, and other accessories shall be as specified in AWWA C111/A21.11 respectively for push-on joints and mechanical-joints. Mechanically coupled joints using a sleeve-type mechanical coupling may be used as an optional jointing method in lieu of push-on joints on plain-end PVC plastic pipe, subject to the limitations specified for mechanically coupled joints using a sleeve-type mechanical coupling and to the use of internal stiffeners as specified for compression-type joints in ASTM D 3139.

C. Sleeve-type mechanical couplings shall be designed to couple plain-end piping by compression of a ring gasket at each end of the adjoining pipe sections. The coupling shall consist of one middle ring flared or beveled at each end to provide a gasket seat; two follower rings; two resilient tapered rubber gaskets; and bolts and nuts to draw the follower rings toward each other to compress the gaskets. The middle ring and the follower rings shall be true circular sections free from irregularities, flat spots, and surface defects; the design shall be such as to provide for confinement and compression of the gaskets. The middle ring shall be of cast-iron and the follower rings shall be of malleable iron. Cast iron shall conform to ASTM A 48 and shall be not less than Class 25. Malleable iron shall conform to ASTM A 47. Gaskets shall be designed for long life and resistance to set after installation and shall meet the applicable requirements specified for gaskets for mechanical joints in AWWA C111/A21.11. Bolts shall be track-head type; bolts and nuts shall be either of the following: bolts conforming to the tensile requirements of ASTM A 307, Grade A, with nuts conforming to the tensile requirements of ASTM A 563, Grade A; or round-head square-neck type bolts conforming to ANSI B18.5 with hex nuts conforming to ANSI B18.2.2. Bolts shall be 5/8” inch in diameter; minimum number of bolts for each coupling shall be as follows (pipe size, number of bolts): 6-inch, 5; 8-inch, 6; 10-inch, 7; 12-inch and 14-inch, 8; 16-inch, 9. Bolt holes in follower rings shall be of a shape to hold fast the necks of the bolts used. Mechanically coupled joints using a sleeve-type mechanical coupling shall not be used as an optional method of jointing except where pipeline is adequately anchored to resist tension pull across the joint.

D. Rubber gaskets for push-on joints shall meet requirements of ASTM F 477. Lubricants shall be suitable for lubricating joint components in potable water systems. They shall be non-toxic and shall not support the growth of bacteria and shall not contribute taste or odor to water systems flushed in accordance with AWWA Standard B601.

E. Gate valves shall be manufactured in accordance with AWWA C500 and shall have a rated water working pressure of 200 PSI. Gate valves shall be iron body, bronze mounted, double disc, parallel seat, non-rising stem type. Each valve shall have "O" ring type stem seal, standard 2" AWWA square operating nut, and shall be opened by COUNTER-CLOCKWISE stem rotation. Valves shall connect directly with PVC pipe using elastomeric gaskets. Valve weight shall not be carried by PVC pipe. Weight shall be supported by a concrete cradle or concrete block with anchors.

F. Chlorinating materials for disinfection shall be either liquid chlorine conforming to AWWA Specification B301 or calcium or sodium hypochlorite conforming to AWWA Specification B300.

G. Valve boxes shall be standard cast iron two-piece 5-¼" inside shaft diameter screw adjustable type, each consisting of a cover marked WATER, an upper telescoping section, and a lower section. Where necessary to provide extra depth, provide cast iron extension pieces as required.

2.02 DUCTILE IRON PIPING AND APPURTENANCES AND ASSOCIATED FITTINGS

A. Ductile iron pipe shall be cement mortar lined and meet the requirements of ANSI A21.51 and AWWA C151. The working pressure shall be rated at 200 PSI plus a surge allowance of 100 PSI. Wall thickness shall be at least that specified by ANSI A21.50 and AWWA C150 for the specified laying conditions (Class 50 minimum).

B. Except as otherwise specified joints shall be "push-on" type, compression type with molded rubber gasket, conforming to ANSI A21.11 and AWWA C111 specifications. Rubber gaskets and lubricants shall meet applicable requirements of ANSI A21.11 and AWWA C110.

C. Dimensional and material requirements for pipe ends, glands, bolts and nuts, and gaskets for mechanical joints, where required or indicated, shall conform to AWWA C111 and ANSI A21.11.

D. Mechanically coupled joints, where required or indicated, shall be sleeve-type mechanical coupling as specified.

E. Sleeve-type mechanical couplings shall be designed to couple plain-end piping by compression of a ring gasket at each end of the adjoining pipe sections. The coupling shall consist of one middle ring flared or beveled at each end to provide a gasket seat, two follower rings, two resilient tapered rubber gaskets, and bolts and nuts to draw the follower rings toward each other to compress the gaskets. The middle ring and the follower rings shall be true circular sections free from irregularities, flat spots, and surface defects. The design shall be such as to provide for confinement and compression of the gaskets. The middle ring shall be of cast-iron and the follower ring shall be of malleable iron. Cast iron shall conform to ASTM A 48 and shall be not less than Class 25. Malleable iron shall conform to ASTM A47. Gaskets shall be designed for long life and resistance to set after installation and shall meet the applicable requirements specified for gaskets for mechanical joints in AWWA C111 and ANSI A21.11. Bolts shall be track-head type and bolts and nuts shall be either of the following: bolts conforming to the tensile requirements of ASTM A 307, Grade A, with nuts conforming to the tensile requirements of ASTM A 563, Grade A; or round-head square-neck type bolts conforming to ANSI B18.5 with hex nuts conforming to ANSI B18.2.2. Bolts shall be 5/8 inch in diameter; minimum number of bolts for each coupling shall be as follows (pipe size, number of bolts): 6-inch, 5; 8-inch, 6; 10-inch, 7; 12-inch and

14-inch, 8. Bolt holes in follower rings shall be of a shape to hold fast the necks of the bolts used. Mechanically coupled joints using a sleeve-type mechanical coupling shall not be used as an optional method of jointing except where pipeline is adequately anchored to resist tension pull across the joint.

F. Cement mortar linings for ductile iron shall meet applicable requirements of ANSI A21.4 and AWWA C104.

G. Ductile iron fittings shall be manufactured in accordance with ANSI A21.10, AWWA C110 and ANSI A21.11, AWWA C111 specifications and shall have a rated water working pressure of 250 PSI.

H. Gate valves shall be manufactured in accordance with AWWA C500 and shall have a rated water working pressure of 200 PSI. Gate valves shall be iron body, bronze mounted, double disc, parallel seat, non-rising stem type. Each valve shall have "O" ring type stem seal, standard 2" AWWA square operating nut, and shall be opened by COUNTER-CLOCKWISE STEM rotation. Except where otherwise specified, indicated, or required for the application involved, all gate valve ends shall be AWWA Specification C111 mechanical joint type, with plain rubber gaskets.

I. Valve boxes shall be standard cast iron two-piece 5-¼" inside shaft diameter screw adjustable type, each consisting of a cover marked WATER, an upper telescoping section, and a lower section. Where necessary to provide extra depth, provide cast iron extension pieces as required.

J. Retainer glands shall be ductile iron mechanical joint set-screw type, installed in accordance with manufacturer's directions, with set screws tightened uniformly to 80 foot pounds torque. This type of anchorage MAY be used at any location instead of concrete anchorage subject to approval, and SHALL be used where indicated and where concrete anchorage is not practicable.

K. Chlorinating materials for disinfection shall be either liquid chlorine conforming to AWWA Specification B301 or calcium or sodium hypochlorite conforming to AWWA Specification B300.

2.03 WATER SERVICE LINE APPURTENANCES

A. Corporation stops shall be ground key type; shall be made of bronze conforming to ASTM B 61 or ASTM B 62; and shall be suitable for the working pressure of the system. Ends shall be suitable for solder-joint, flanged lead joint, or flared tube compression type joint. Threaded ends for inlet and outlet of corporation stops shall conform to AWWA C800; coupling nut for connection to flared copper tubing

shall conform to ANSI B16.26.

B. Goosenecks shall be Type K copper tubing. Joint ends for goosenecks shall be appropriate for connecting to corporation stop and service line. Where multiple gooseneck connections are required for an individual service, goosenecks shall be connected to the service line through a suitable approved brass or bronze branch connection; the total clear area of the branches shall be at least equal to the clear area of the service line. Length of goosenecks shall be in accordance with standard practice.

C. Curb or service stops shall be ground key, round way, inverted key type; stops shall be made of bronze conforming to ASTM B 61 or ASTM B 63 and shall be suitable for the working pressure of the system. Ends shall be as appropriate for connection to the service piping. Arrow shall be cast into body of the curb or service stop indicating direction of flow.

D. Each curb or service stop shall be provided with an adjustable cast-iron curb box of a size suitable for the stop on which it is to be used. The head shall be round and the lid shall have the word "WATER" cast on it. Each box shall be given a heavy coat of bituminous paint.

2.04 FIRE HYDRANTS

A. Hydrants shall conform to AWWA C502 design. Hydrants shall have two 2-½ inch hose connections. Inlet shall have mechanical-joint end; end shall conform to the applicable requirements as specified for the joint. Size and shape of operating nuts and threads on hose shall be as specified in AWWA C502.

PART 3 - EXECUTION

3.01 PIPE LAYING AND JOINTING

A. Pipe, fittings, valves, and accessories will be carefully inspected by the ENGINEER before and after installation and those found defective will be rejected. Remove fins and burrs from pipe and fittings. Before placing in position, clean pipe, fittings, valves, and accessories and maintain in a clean condition. Provide proper facilities for lowering sections of pipe into trenches. Do not under any circumstances drop or dump pipe, fittings, valves, or any other water line material into trenches. Cut pipe accurately to measurements established at the site and work into place without springing or forcing. Replace by one of the proper dimensions any pipe or fitting that does not allow sufficient space for proper installation of jointing material. Blocking or wedging between bells and spigots will not be permitted. Lay bell-and-spigot pipe with the bell end pointing in the direction of

laying. Grade the pipeline in straight lines, taking care to avoid the formation of any dips or low points. Support pipe at its proper elevation and grade, taking care to secure firm and uniform support. Wood support blocking will not be permitted. Lay pipe so that the full length of each section of pipe and each fitting will rest solidly on the pipe bedding; excavate recesses to accommodate bells, joints, and couplings. Provide anchors and supports where necessary for fastening work into place. Make proper provision for expansion and contraction of pipelines. Keep trenches free of water until joints have been properly made. At the end of each day's work, close open ends of pipe temporarily with wood blocks or bulkheads. Do not lay pipe when conditions of trench or weather are unsuitable.

3.02 PIPING LOCATIONS

A. Water lines shall not be laid in the same trench with other utilities.

B. Water pipe shall not be laid closer horizontally than 10 feet from a sewer line and 18” vertically with the water line over the sewer line.

C. Sewer pipes shall not be allowed to cross above water lines.

D. Pipe passing through walls or valve pits and structures shall be ductile iron and shall be provided with iron wall sleeves. Annular space between walls and sleeves shall be filled with rich cement mortar. Annular space between pipe and sleeves shall be filled with mastic.

E. Where connections are made between new work and existing mains, the connections shall be made by using specials and fittings to suit the conditions. Connections to be made under pressure or in the dewatered condition shall be installed as approved by the ENGINEER and according to the recommendations of the manufacturer of pipe being tapped.

F. Locator wire shall be placed along and approximately one foot above all water mains. Locator wire shall be #12 solid copper type THHN or THWN VW-1 600V gasoline and oil resistant insulated wire. All costs associated with the installation of locator wire shall be included in the base bid price of the bid schedule.

G. Water lines which cross over sewer shall have a vertical separation of at least 18".

H. Minimum depth of cover for water lines shall be three (3) feet.

3.03 VALVE INSTALLATION

A. Gate valves shall be installed where shown or specified and provided with a valve box.

1. Valves and valve boxes shall be set plumb. Valve boxes shall be centered on the valves.

2. Earth fill shall be carefully tamped around each valve box to a distance of 4 feet on all sides of the box, or to the undisturbed trench face if less than 4 feet.

3.04 ANCHORAGE

A. Bends, plugs, caps, tees, valves, etc. shall be restrained using Mega-Lug fittings in conjunction with mechanical joint fittings

3.05 TESTING

A. After backfilling, subject all pipework to pressure and leakage tests. Piping may be tested in sections between valves as the work progresses. Admit water slowly into the section to be tested, and expel all air through openings at all high points in the piping, as required. After all air has been expelled apply a hydrostatic pressure of 150 psi, or as directed by the engineer, measured at the lowest point in the piping section involved. Maintain the test pressure at least two hours, during which time the leakage shall not exceed that permitted by AWWA Specification C600 for ductile iron and UNI B-3 for PVC. Repair all apparent leaks. If the measured leakage exceeds the maximum specified allowable leakage, locate and repair the leaks, and repeat the tests on sections of pipe involved until all tests have been approved. Furnish approved testing equipment, consisting of a suitable pump to apply and maintain test pressure, accurate pressure gauges, suitable equipment to measure volume of water pumped, and other necessary equipment, and conduct all tests in the ENGINEER'S presence, as approved. Determine leakage by measuring the volume of water pumped to maintain the required test pressure for the duration of the leakage test. Obtain a copy of AWWA Specification C600, and keep it on the job in good condition for the CONTRACTOR'S and ENGINEER'S use in computing the permissible leakage in each section to be tested.

3.06 STERILIZATION

A. Before acceptance of potable water operation, each unit of completed water distribution line and water service line shall be disinfected meeting AWWA C651. After pressure tests have been made, the unit to be disinfected shall be thoroughly

flushed with water until all entrained dirt and mud have been removed before introducing the chlorinating material.

B. The chlorinating material shall be either liquid chlorine, calcium hypochlorite, or sodium hypochlorite, as specified in this section and the chlorinating material shall provide a dosage of not less than 50 parts per million and shall be introduced into the water lines in an approved manner.

C. The treated water shall be retained in the pipe long enough to destroy all non-spore-forming bacteria. Except where a shorter period is approved, the retention time shall be at least 24 hours and shall produce not less than 10 ppm of chlorine throughout the line at the end of the retention period.

D. Valves on the lines being disinfected shall be opened and closed several times during the contact period, and then the line shall be flushed with clean water until the residual chlorine is reduced to less than 1.0 ppm.

E. After completion of the construction and disinfection of water distribution mains, the Contractor shall arrange for at least one sample to be collected by the county sanitarian, consulting engineer or waterworks superintendent from every dead end line and every major looped line for bacteriological examination. 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. No coliform bacteria and no confluent growth indication shall constitute a satisfactory sample when analyzed by the Mississippi Department of Public Health Laboratory or a laboratory certified by the Mississippi State Department of Health. Tests must indicate the absence of pollution for at least two (2) full days.

F. Water for testing, sterilizing, and flushing will be furnished by the OWNER from existing water facilities, without cost to the CONTRACTOR, but the CONTRACTOR shall furnish all piping and equipment to convey the water to the new pipe lines.

3.07 WORK ON ROAD RIGHTS-OF-WAY

A. Do all work on the road rights-of-way under the supervision of the Road, Street, or Highway Department, and in strict accordance with their requirements. DO NOT UNDER ANY CIRCUMSTANCES PLACE ANY EXCAVATED MATERIALS, CONSTRUCTION MATERIALS, CONSTRUCTION EQUIPMENT, OR OTHER ITEMS ON THE ROADWAY. Arrange all work to avoid all unnecessary interference with traffic.

3.08 FINAL CLEAN-UP

A. Clean up the distribution system as the work progresses. Negligence in proper cleaning up which causes undue inconvenience to the public or private citizens, or presents an unsightly or dangerous condition, or causes embarrassment to civic officials will be sufficient reason for rejection of construction estimates until the unsatisfactory conditions have been remedied.

B. After all work is complete, make a final clean up of all areas where work has been done, and leave them in broom clean condition.

3.09 FINAL VALVE AND DISTRIBUTION SYSTEM CHECK

A. After completion of all water line work and before the work will be accepted, make a final check of each valve installed in this project, and of each existing valve that has been operated in connection with the work under this project.

B. Make this final check in the ENGINEER's presence, and demonstrate that each valve is fully open and is operating properly.

C. In the presence of the OWNER's, ENGINEER’s, and CONTRACTOR's representative conduct a final "walk over" inspection of all work installed under this contract to insure that all requirements of these specifications have been fulfilled. Application for final payment will not be processed until this inspection has been accomplished and all deficiencies have been corrected.

END OF SECTION

SECTION 04400

WATER TREATMENT PLANT

PART 1-GENERAL

The Contractor shall furnish all labor, materials, and equipment necessary to complete a 800 GPM water treatment plant in the location designated by the Engineer. The plant shall be constructed in strict accordance with these specifications and requirements of the Mississippi State Board of Health. The prime contractor is responsible for completion of the connection to the water well and existing distribution system.

PART 2 – PACKED AERATOR

1.1 GENERAL

A. The contractor shall supply and install an induced draft Aerator as shown on the drawings. The aerator shall be capable of reducing CO2 from a level of 100 PPM to 10 PPM for a plant with a flow of 800 GPM (Deductive Alternate #1: 600 GPM).

1.2 Aerator Vessel

A. The aerator shall be not less than 7' square (Deductive Alternate #1: 6' square) with a minimum side height of 12' and shall be molded F.R.P. construction. The resin shall be an approved isotholic polyester with prior sanction under Title 21 (Chapter 1, Part 120). Fiberglass reinforcement shall be type E with a silane finish. Exterior surface shall reflect the mould surface. Gel-coat shall be white with sufficient ultra violet inhibitors to prevent sunlight degradation. Vessel shall be equipped with a door/guide assembly which allows easy access to pipes for inspection and/or cleaning. Round construction is not acceptable.

1.3 Catch Basin

A. A pan, integral to the vessel and being at least 12" deep shall be provided to collect the aerated water. The pan shall be equipped with a effluent nozzle standard, pressed 12" fiberglass companion flange, and a test faucet.

1.4 Distribution

A. The aerator shall be equipped with a FRP header system equipped with the proper number of non-corrosive nozzles so as to assure uniform distribution of invert water to trays. Invert header shall be equipped with a 10" pvc pipe extending 18" out from the side of the vessel.

1.5 Induced draft blower

A. The blower shall be the induced draft type with a capacity of 4,000 CFM (Deductive Alternate #1: 3,000 CFM) @ 3/4" S.P. The unit shall be of aluminum construction and the motor

shall be totally isolated from the air stream. Belt driven and non-overloading blower shall be capable of developing 1" vacuum (water column).

1.6 Core media

A. Each aerator shall be equipped with 4" PVC schedule 80 pipe which are spaced on 7" vertical centers and 6-1/2" horizontal centers. The pipes shall be arranged to cause water to cascade and impringe on offset pipes. Pipe area shall be of sufficient size to cause the release of the entrapped co2 and allow absorption of enough oxygen to oxidize 2 PPM of ferrous iron. Piping shall be dimensioned as to be removable through the access door for cleaning.

1.7 Demister

A. Aerators shall be equipped with a mist eliminator which is made of non-corrosive material and shall be capable of reducing water droplets to a maximum size of 40 micron.

1.8 Manufacturer

a. Aerators shall be model ID-FG-7-P as manufactured by Deloach Industries, Inc or approved equal.

PART 3 – PUMP RESERVOIR

The Contractor shall furnish and install a pump reservoir with the capacity of approximately 34,000 gallons to be 29’-5” long by 29’-5” wide by a 6’-6” average depth, and constructed of 4000 psi reinforced concrete. The reservoir shall be equipped with formed openings as shown on the plans.

PART 4 – CHEMICAL HOUSE

The Contractor shall construct on the top slab of the ground reservoir chemical house with related appurtenances as shown on the plans. Structural and concrete material shall be as specified on the plans.

PART 5 – SERVICE PUMPS

1.1 GENERAL

A. The Contractor shall furnish and install of two (2) vertical turbine pumps. The pumps shall be manufactured by Peerless Pump Co or approved equal.

1.2 BASIC VERTICAL TURBINE DESCRIPTION

A. The units shall be installed in a sump approximately 10 feet deep. The overall length from the mounting base to the bottom of the suction bell is to be 114.".

B. The pumps will be started and stopped with open discharge.

C. The pumps shall be designed for 800 gpm at 135'. The pump speed shall not exceed 1750 rpm. The efficiency of the pumping unit shall be 79.58%.

1.3 MOTORS

A. The motor thrust bearing shall have ample capacity to carry the weight of all the rotating parts plus the hydraulic thrust of the pump impellers, and have an ample safety factor. This factor should be based on an average life expectancy of five years operation at 24 hours per day. The motor shall be of the full voltage starting, vertical hollow shaft, squirrel cage induction type, non-reversing clutch and shall conform to the Standard of the American Institute of Electrical Engineers.

B. The motor shall be a 40 HP , 230/460 Volt, Three Phase, 60 cycle, not more than 1750 rpm at no load and shall be of proper size to drive the pump continuously under the total head specified with a temperature rise not exceeding 90 degrees C by resistance at service factor load above ambient temperature. The motor design shall be premium efficiency style.

1.4 PUMP HEAD

A. The pump head of high grade cast iron shall be provided for mounting the motor, with a 6" 125# ANSI discharge flange. The top of the head shall have a machined register to fit the motor. It shall be of sufficient strength to carry the complete weight of the pump and motor and withstand the hydraulic loads normally imposed on it by the system. The stuffing box shall have the proper type and amount of packing to prevent excessive leakage in the head. The head shall include a tapped opening for draining away the normal leakage from the packing.

1.5 PUMP COLUMN ASSEMBLY

A. The column pipe shall be not less than 6 inches inside diameter. The pipe shall be furnished in interchangeable sections not over five feet in length, and shall be connected with threaded, sleeve type couplings. The joints are to be butted to insure perfect alignment after assembly.

B. The line shafting shall be turned, ground and polished precision shafting of ample size to operate the pump without distortion or vibration. The shaft shall be furnished in interchangeable sections not over five feet in length, and shall be coupled with strong steel couplings machined from solid bar steel. A non-corrosive flame sprayed stainless steel journal shall be placed on each shaft at the bearing point. The stainless steel journal o.d. will be substantially flush with the shaft o.d. (Recess not to be deeper than diameter corresponding to the root diameter of shaft threads).

C. The column assembly shall have bronze bearing retainers threaded into the pipe couplings and retained by the butted pipe ends. Each bearing retainer shall contain couplings and retained by the butted pipe ends. Each bearing retainer shall contain a water lubricated, cutlass rubber bearing designed for vertical turbine pump service.

1.6 PUMP BOWL ASSEMBLY

A. The bowl unit assembly shall be model M12LD with 2 stages. The pump bowls shall be of close grained cast iron having a minimum tensile strength of 30,000 pounds per square inch, free from blow holes, sand holes, and all other faults; accurately machined and fitted to close dimensions.

B. The impeller shaft shall be of stainless steel of not less than 12% chrome. The impeller shaft shall be supported by a combination of water lubricated, fluted rubber and bronze bearings.

C. The impeller shall be of bronze accurately machined and finished, and mechanically balanced. They shall be securely fastened to the impeller shaft with a tapered bushing.

D. Each bowl shall have an impeller seal ring to prevent slippage of water between bowl and impeller. The impellers shall be adjustable by means of a top shaft nut at the top of the motor.

PART 6 – CHEMICAL FEEDER

The Contractor shall furnish one chemical feeders to feed Soda Ash.

The chemical feeder shall be a Chem Tech Series 300 Model 310, or approved equal.

The pump shall be a simplex configuration capable of 500 gpd against 150 psi discharge pressure. Output control shall be possible while pump is operating by manually adjusting stroke length over ten to one operating range.

Pump housing shall be constructed of chemically resistant, fire retardant plastic with stainless steel external fasteners. Diaphragm shall be fabric reinforced and metal backed.

Each unit shall include pumping mechanism, motor, speed reducer, two 4-step pulleys, injection valve assembly, single check valve on suction and discharge, strainer assembly, discharge tubing and suction tubing.
Each feeder shall be supplied with PVC tanks with a capacity of 150 gallons each. Each feeder shall be supplied with a 1/3 HP mixer. Pump and Mixer to be mounted on a 24" shelf by contractor on the wall.

PART 7 – CHLORINATION SYSTEM

PART I - GENERAL

1.0l Description and Scope of Work

A. The work covered by this section includes furnishing all labor, equipment, and material to install, test, and place in satisfactory operating condition an automatic, vacuum-operated, solution-feed chlorination system as described herein and/or shown on the Drawings.

B. The chlorination system shall consist of equipment from one of the existing chlorinator on site including: two cylinder-mounted vacuum regulators, an automatic switchover valve, a chlorine gas flowmeter, a chlorine ejector, a chlorine gas detector, and all interconnecting wiring, piping, tubing, connectors, clamps, adaptors, mounting brackets and supports required for a complete installation.

C. The chlorination system shall be used in the service of chlorinating water.

1.02 Performance and Design Criteria

A. The chlorination system shall have a capacity range of 4 to 100 pounds per day (24 hour period).

B. The chlorination system shall be provided with an automatic switchover system to automatically change over from an exhausted chlorine supply to a standby source.

C. The chlorination system design shall provide for conveying the chlorine gas under vacuum from the vacuum regulator through to the chlorine ejector.

PART 2 - PRODUCTS

2.01 General

A. All components in the chlorination system shall be constructed of corrosion-resistant materials. Components in contact with chlorine gas or chlorine solution shall be of silver, tantalum, polyethylene, PVC, ABS, Teflon, glass or other suitable material. All plastic parts shall be machined.

B. Wall-mounted plastic tubing shall be supported at intervals not to exceed 18 inches.

C. Chlorination equipment shall be Hydro 500 Series, Advance 200 Series.

2.02 Vacuum Regulators

A. Vacuum regulators shall be designed to mount directly on a 150 pound chlorine cylinder by means of a gasketed yoke clamp connection.

B. The vacuum regulator shall contain a spring-opposed diaphram valve to regulate vacuum in the system to a closely controlled valve. The vacuum regulator shall provide a positive, tight shutoff of the chlorine gas supply should there be a loss of vacuum in the system.

C. Each vacuum regulator shall have a flowmeter mounted internally to the regulator to show the flow rate.

D. A diaphram-operated pressure valve shall be provided on the unit to prevent the build up of pressure in the system.

E. An excess vacuum shut-off valve shall be provided on the unit to isolate the vacuum regulator and chlorine gas supply from the rest of the system in the event of excessive system vacuum.

F. A visible, gravity-actuated indicator shall be provided on the unit to provide a visual signal when the chlorine gas supply is exhausted or interrupted.

2.03 Automatic Switchover Valve

A. The automatic switchover valve shall be a vacuum-operated device and shall cause automatic switchover from an exhausted chlorine gas source to a standby source.

B. The valve shall provide positive, tight shutoff to the exhausted chlorine source, and shall not require resetting after the exhausted supply is exhausted.

C. The system shall not permit return to the initial source until the standby source is exhausted.

D. The switchover valve shall be factory tested and shall not require field adjustment.

E. The switchover valve shall be furnished with NPT connections and adaptors for connection to 3/8-inch O.D. plastic gas vacuum tubing.

F. The switchover valve shall be furnished with a bracket for wall mounting.

2.04 Chlorine Gas Flowmeter

A. The chlorine gas flowmeter shall be of the rotameter type and shall have a linear scale not less than 3 inches in length.

B. The rotameter tube shall be selected to provide a maximum chlorine gas flow of 50 pounds per day.

C. The flowmeter shall be furnished with NPT connections and adaptors for connection to 3/8-inch O.D. plastic gas vacuum tubing.

D. The flowmeter shall be furnished with a bracket for wall mounting.

2.05 Chlorine Ejector

A. The chlorine ejector shall be of the fixed-throat, aspirator type and shall be constructed of materials that resist corrosion and erosion. All plastic parts shall be machined.

B. It shall be provided with a spring opposed, diaphragm-operated check valve to prevent water or solution from entering the gas vacuum system.

2.06 TWO CYLINDER SCALE

A. One (1) two-cylinder scale shall be provided for the chlorine room. The scale shall hold two 150 pound cylinders and be capable of direct and continuous readout of pounds of gas left in each cylinder.

PART 8 – PHOSPHATE

1.1 GENERAL

1.0l Description and Scope of Work

A. The work covered by this section includes furnishing all labor, equipment, and material to install, test, and place in satisfactory operating condition an phosphate feed system as described herein and/or shown on the Drawings.

B. The system shall the existing phosphate feed equipment on site. Contractor is responsible for providing all equipment for full and correct operation of the phosphate feed system with the proposed treatment plant.

PART 9 – CONTROLS

See Section – Process Instrumentation and Control.

PART 10 – TESTING AND CHLORINATION

Upon completion of the erection of the treatment plant, the ground tank shall be tested by filling the tank with water and any leaks or other defects which may appear shall be repaired as to leave the tanks in absolutely first-class condition. When the tank is filled for the final test, the Contractor shall disinfect the treatment plant as per AWWA standard C653. A solution strength

of 50 mg/L free chlorine applied for 24 hours is required.

The disinfection shall be confirmed by two (2) consecutive samples of chlorine-free water found to be free of organisms of the Coli-Aerogenes Group.

PART 11 – BASIS OF PAYMENT AND ACCEPTANCE

The Contractor shall be paid by the Owner for work performed under this Contract in accordance with the following basis of payment.

The following bid items shall be paid for at the contract price, which shall be full compensation for completing the work specified. Payment will be made under:

Item No. X Water Treatment Plant - Lump Sum

END OF SECTION

SECTION 04500

PRESSURE FILTER SYSTEM

1.1 GENERAL

A. The Contractor shall furnish and install four (4) 10' diameter pressure filters for removing iron from water supply. The filters shall be manufactured by Mississippi Filter Co or approved equal. The manifold piping shall be arranged so that the filter can be backwashed from the system water supply.

1.2 BASIC FILTER DESCRIPTION

A. The filters shall be multiple unit, pressure type, diameter as indicated, designed for a flow rate of 3 gallons per minute (gpm)or less per square foot of surface. They shall be designed for a minimum of 100 pounds per square inch of working pressure. The tanks shall each have a 24" manway. Units shall be painted in accordance with the AWWA standard specifications for painting storage tanks. The contractor shall submit shop drawings on the filter, components, paint system, filter media, and valves for approval prior to ordering material.

B. Filter internal equipment shall consist of upper and lower manifolds. Upper manifold, distributor laterals and fittings shall all be steel schedule 40. Lower header manifold system shall all be schedule 80 pvc. The lower header manifold system will be installed in the filter after the concrete has been placed and finished. They will be held in place with structural channel and u-bolts. The installation of the laterals will be by the contractor.

C. Concrete will be placed in the filter bottom by the contractor. The concrete will be finished to a smooth flat surface.

1.3 MOUNTING ACCESSORIES

A. Support Legs shall be welded to the sides of the filter for mounting on concrete foundations.

1.4 FILTER MEDIA

A. The media shall consist of Greensand Plus media, anthracite and miscellaneous gravel sizes per the contract drawings in the straight height.

B. The Greensand Plus media shall be 18" of straight height and will oxidize and

remove iron, manganese and hydrogen sulfide from the well water. It shall be shipped in water-proof bags of 1 cubic foot capacity.

C. The anthracite shall be 6" of straight height and no. 1 special anthracite having an effective size of 0.85 to 0.95 mm and a uniformity coefficient of 1.7 maximum. It shall be composed of hard durable grains, as free as commercially possible of extraneous dirt.

D. The gravel shall be as follows:

6"	filter sand
4"	1/8" - 1/4" gravel
4"	1/4" - 1/2" gravel
10"	1/2" - 3/4" gravel

E. All filter media shall be pre-washed prior to bagging and shall be free of clay, loam, organic or other deleterious material.

END OF SECTION

SECTION 05600
METAL ROOFING

PART 1 - GENERAL

A. SCOPE: Provide all labor, materials, equipment and appurtenances necessary to comply with the drawings and these specifications for the installation of metal roofing.

B. RELATED WORK SPECIFIED ELSEWHERE:

1. Flashing and Sheet Metal
2. Sealants and Caulking

C. SUBMITTALS:

1. Product Data: Furnish product data with installation details for materials to be provided under this section showing color and configuration. Provide color chart for selection prior to sample submittal.

2. Physical Samples: Furnish physical samples of roof panels proposed for this project when requested by Owner.

PART 2 - PRODUCTS

A. METAL ROOF PANELS: The metal roof system shall be a roof system designed for the spans indicated and shall be equal to MBCI “PBR” roof panel. The panel shall be roll formed from 50,000 psi yield steel in 26 gauge. Color shall be “Galvalume”

B. TRIM: Shall be same material as roofing panels, color as selected. Trim shall be furnished at eaves, rake, ridge and whenever necessary to seal against the weather and provide a finished appearance.

PART 3 – WARRANTY

A. CONTRACTOR’S WARRANTY: General Contractor shall provide a two year warranty against any leaks or defects. During the warranty period, the General Contractor shall be responsible for taking corrective action in the event of water intrusion.

PART 4 - EXECUTION

A. Installation of roof panels, trim and accessories shall be performed by a trained and qualified installer.

B. All work performed by the installer will be inspected by the Owner.

END OF SECTION

SECTION 06001

CARPENTRY WORK

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Rough carpentry, finish carpentry, and cabinet work.

1.02 QUALITY ASSURANCE

A. Rough carpentry lumber: Visible grade stamp, of agency certified by National Forest Products Association (NFPA).

B. When applicable, fabricate cabinet work and site made finish carpentry items in accordance with recommendations of quality Standards of Architectural Woodwork Institute (AWI.)

1.03 GRADING REQUIREMENTS

A. Moisture Content: Not to exceed nineteen percent (19%) for framing lumber and six percent (6%) for millwork.

B. Grade and Trademark: Each piece of framing lumber an plywood to be grade stamped.

C. Quality: Lumber must be sound, thoroughly seasoned, and free from warpage that cannot be corrected in the building process. All woodwork, interior and exterior, exposed to view, shall be dressed.

D. Cabinets: NKCA and ANSI A161.1 specifications.

1.04 SUBMITTALS

A. Submit shop drawings of cabinet work in accordance with Section 01300.

B. Submit samples of standard colors and patterns of plastic laminate for Architect/Engineer selection.

1.05 DELIVERY, STORAGE AND HANDLING

A. Do not deliver shop fabricated carpentry items until site conditions are adequate to receive the work. Protect items form weather while in transit.

B. Store indoors, in ventilated areas with a constant, minimum temperature of 60 degrees F. (16 degrees C.), maximum relative humidity of 25 to 55 percent.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Ceiling Joists and Roof Framing: #2 Common Southern Yellow Pine.

B. Studs: Construction grade Cedar, Douglas Fir, Southern Yellow Pine or Spruce.

C. Nails, Spikes and Staples: Galvanized for exterior locations, high humidity locations and treated wood; plain finish for other interior locations; size and type to suit application.

D. Bolts, Nuts, Washers, Lugs, Pins and Screws: Medium carbon steel; sized to suit application, galvanized for exterior locations, high humidity locations and treated wood; plain finish for other interior locations.

E. Interior Wall Board: Hardipanel Vertical Siding, 4' x 9' sheets 5/16" thick with smooth finish.

F. Interior Ceiling Board: Hardipanel Vertical Siding, 4'x8' sheets 5/16" thick with smooth finish.

G. Interior Trim: Harditrim Planks – XLD Trim Smooth Texture, 4" width, 5/4 x 10'

H. Exterior Siding: Cedar Board and Batten (To match existing buildings)

I. Exterior Trim: Cedar (To match existing buildings)

2.02 MILLWORK

A. All millwork shall be manufactured by a reputable manufacturer and approved by the Architect.

B. Work will be assembled at mill insofar as practical and delivered ready for erection.

C. Mill assemblies will joined hidden nails and screws where possible, with mortice tendons, glued to blocks.

D. All exposed surfaces to be sanded to a smooth, ready to finish surface.

E. Erect all cabinets straight, level, and plumb, and securely anchor in place.

F. Drawers are to be equipped with side mounted metal rail type drawer slides with nylon ball-bearing rollers rated at 75 lbs.

G. Cabinets shall have face frames constructed of ¾" solid kiln dried poplar or equivalent hardwood with outer members assembled using the corrugated fastener method. End rails shall be dadoed to receive end panels stapled to the inside of face member and end panel.

Face nailing will not be permitted. End panels shall be dadoed to receive shelf, bottoms and wall tops. All end panels let into face frame rails are ¾" 7-ply hardwood plywood with hardwood nosing. Doors and drawer fronts shall have all edges covered with hardwood edge strip or cap mold as per details. Doors and drawer fronts shall be ¾" 7-ply cabinet birch plywood. Cabinet base bottoms and tops shall be ¾ 7-ply hardwood plywood let into ends, sides and back. Drawers shall be constructed with fronts the same as specified for doors. Drawer front and sides shall be dadoed to receive drawer bottoms. Backs of cabinets to be ½" plywood. Doors shall be provided with corrosion resistant, self closing, concealed steel hinges equal to Blum CLIP hinges with 110 degree opening angle to provide smooth, quiet door operation. Equip all doors with Stanley 4483 ½ pulls in brass color.

2.03 MILLWORK FABRICATION

A. Fabricate cabinet work and finish carpentry items in accordance with recommendations of AWI. Shop fabricate items where possible.

B. Fit shelves and exposed edges with 3/8 inch thick matching hardwood edging. Use full length pieces only.

C. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Corners and joints to be hairline. Slightly bevel arises. Locate counter butt joints at least two (2) feet from sink cutouts.

D. Cap exposed plastic laminate edges with material of same finish and pattern.

E. Use exposed fastenings devices or nails only when unavoidable.

F. Shop assemble cabinet work and finish carpentry items for delivery to site in sizes easily handled and to ensure passage through building openings.

PART 3 – EXECUTION

3.01 INSTALLATION OF FINISH CARPENTRY ITEMS AND CABINET WORK

A. Set and secure cabinet work and finish carpentry items in place rigid, plumb, and square.

B. Use purpose designed fixture attachments for mounted components.

C. Use threaded steel concealed joint fasteners to align and secure adjoining counter tops.

D. When necessary to cut and fit on site, make materials with ample allowance for cutting. Provide trim for scribing and site cutting.

E. Permanently fix counter bases, shelving to floor using appropriate angles and anchorages.

F. Counter sink semi-concealed anchorage devices used to wall mount components and conceal with solid plugs of species to match surrounding wood. Place flush with surrounding surfaces.

G. Carefully scribe cabinet work which is against other building materials, leaving gaps of 1/32 inch maximum. Do not use additional overlay trim for this purpose.

H. Install and adjust cabinet hardware to correct operation.

I. Ensure that mechanical and electrical items affecting this Section of work are properly placed, complete, and have been inspected by the Architect/Engineer prior to commencement of installation.

END OF SECTION

SECTION 06100
ROUGH CARPENTRY

PART 1 - GENERAL

1.01 DESCRIPTION

Applicable provisions of Instructions to Bidders, General and Supplementary Conditions and summary of work govern work under this section.

1.02 COORDINATION WITH OTHER TRADES

Coordinate locating of nailers, furring, blocking so that installation of finish work may be properly executed to fulfill design requirements.

1.03 MOISTURE CONTENT OF LUMBER

Maximum moisture content for lumber products 19 percent for air dried stock, 15 percent maximum for kiln-dried (KD) stock. Furnish kiln-dried material unless air dried material is indicated for below.

1.04 DRESSING LUMBER

Surface lumber four sides (S4S).

1.05 DELIVERY AND STORAGE

A. Protect materials when delivered at site; place under cover, protect from weather.

B. Do not store or erect kiln-dried material in wet or damp portions of building or in areas where plastering or similar work is to be executed until work has been completed and become dry.

1.06 GRADING RULES AND WOOD SPECIES

A. Latest editions and supplements of grading rules associations for materials furnished under this Section:

1. Southern Pine Inspection Bureau (SPIB).

2. Western Woods Products Association (WWPA).

3. American Institute of Timber Construction (AITC).

1.07 NOMINAL LUMBER DIMENSIONS

Conform to industry standards by above rules writing agencies.

1.08 GRADE MARKS

Lumber and plywood identified by official grade mark. Plywood to bear DFPA grade trademark of American Plywood Association.

1.09 PLYWOOD GRADING RULES

A. Latest editions and supplements of the following standards:

1. Softwood Plywood: U.S. Product Standard PS-1-66 Construction & Industrial.

2. Hardwood Plywood: U.S. Commercial Standard CS-35.

PART 2 - PRODUCTS

2.01 LIGHT FRAMING LUMBER

A. Wood materials for light framing; 2 inch nominal thickness and less; conform to following grade standards for standard dimension lumber:

1. Sills in contact with concrete masonry; roof nailers; No. 2 (pressure treated) S.Y.P. (SPIB); No. 2 Douglas Fir (WWPA).

2. Studs, bucks, joists, other light framing; No. 2 or better S.Y.P. (SPIB); No. 2 or better Douglas Fir (WWPA).

2.02 PLYWOOD MATERIALS

Softwood plywood conform to requirements of U.S. Product Standard PS 1-66, Construction and Industrial.

Floor decking shall be APA Rated Sheathing, Sturd-I-Floor.

2.03 FASTENING DEVICES

A. Anchors and fasteners for securing wood items:

1. Bolts, nuts, studs, rivets: Federal Specifications FF-B571a and FF-B575.

2. Expansion shields: Federal Specification FF-S-325. Shields accurately recessed and, unless otherwise indicated shall be not lest than 2 ½ inches into concrete or masonry.

3. Lag screws, lag bolts: Federal Specification FF-B0561b.

4. Toggle bolts: Federal Specification FF-B588b.

5. Wood screws: Federal Specification FF-S111b.

6. Nails, staples: Federal Specification FF-N-105a.

7. Hardened steel nails, expansion screws, toggle bolts, metal plugs, metal inserts, as appropriate for each type of masonry or concrete construction to be used for fastening wood to concrete or masonry.

8. Explosive-Driven Fastenings: When approved by the Architect.

9. Joint Hangers: 18 gauge, zinc coated, corrosion resistant, sheet steel, or as indicated on structural.

10. Form Anchor Straps: Mild steel, hot-dipped galvanized after fabrication.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install materials as indicated or required.

B. Provide blocking grounds, etc., with solid, secure anchorage, where required by other trades.

C. Make all cuts exact and true to line.

D. Bolt all anchorage to steel members, nail to wood members, concrete slabs.

E. Install plywood so that surface of adjacent pieces are in same plane within one-sixteenth inch (1/16").

F. Where plywood used for subflooring, solid brick under all joints.

END OF SECTION

SECTION 06172
PREFABRICATED WOOD JOIST & TRUSSES

PART I – GENERAL

1.01 STANDARDS: Comply with N.F.P.A. National Design Specification and with TPI standards including "Quality Standard for Metal Plate Connected Wood Trusses", "Commentary and Recommendations for Handling and Erecting Wood Trusses", "Commentary and Recommendations for Bracing Wood Trusses" and the following:

A. "Design Specification for Metal Plate Connected Wood Trusses".

B. "Design Specification for Metal Plate Connected Parallel Chord Wood Trusses".

1.02 SUBMITTALS: In addition to product data for truss components submit the following:

A. Shop drawings showing sizes, design values, materials, and dimensional relationships of components as well as bearing and anchorage details.

B. To extent engineering design considerations are fabricator's responsibility, submit design analysis and test reports indicating truss performance characteristics and compliance with requirements. Shop drawing must be stamped by an engineer licensed in the state of Mississippi.

C. Certification, signed by officer of fabricating firm, indicating trusses comply with project requirements.

D. Handle and store trusses with care and to comply with TPI recommendations to avoid damage from bending, overturning or other cause.

PART 2 – PRODUCTS:

2.01 LUMBER: Provide lumber S4S, S-Dry unless otherwise indicated grade marked, complying with PS 20 and requirements indicated.

A. Lumber Species: Any softwood, at Contractor's option, graded under WWPA, WCLB, SPIB or NLGA rules, which complies with other requirements.

B. Stress Rating: Provide lumber which has been graded or tested and certified to comply with stress ratings/load requirements indicated on drawings.

2.02 METAL CONNECTOR PLATES: Metals and thickness as indicated, but not less than thickness indicated below:

A. Hot-Dip Galvanized Sheet Steel: ASTM A 446, Grade A, G60, 0.036" thick.

B. Fasteners and Anchorages: Of size, type, material and finish suited to application shown.

2.03 FABRICATION: Fabricate and assemble trusses to provide units of configuration indicated, with closely fitted joints and connector plates securely fastened to wood members.

PART 3 – EXECUTION:

3.01 Install trusses to comply with TPI referenced standards and other indicated requirements.

3.02 Trusses shall be spaced at 24 inches on center.

3.03 Contractor has option to use "stick Framing" methods or trusses where trusses are too small to be economical. If this option is taken, it is the contractor's responsibility to adjust framing details to comply with design intent.

3.04 Truss manufacturer is ultimately responsible for truss design, loading and configuration.

END OF SECTION

SECTION 06200
FINISH CARPENTRY

PART 1 – GENERAL

1.01 DESCRIPTION

A. The Work required under this Section consists of all finish carpentry and related items to complete the work indicated on the Drawings and described in the Specifications.

1.02 QUALITY ASSURANCE

A. Sizes, thicknesses and grades shall be as defined by the rules of the recognized Association of Lumber Manufacturer's producing the materials specified, but defects or blemishes prohibited by this Specification, even though permissible in grade, shall not appear in the materials used.

B. Each panel of softwood plywood shall be identified with the DFPA Grade trademark of the American Plywood Association and shall meet the requirements of the latest edition of U.S. Product Standards PS-1-66 for Softwood Plywood.

C. All millwork shall conform to AWI Custom Grade for transparent or paint finish as selected by the ENGINEER.

1.03 SUBMITTALS

A. Submit in accordance with General Conditions. Shop Drawings shall include complete elevations, sections, and details of construction; finishes; methods of assembling sections; location and installation of hardware ; size, shape and thickness of materials; joint and connection details; and details of joining with other work.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Insure proper protection from weather and damage during delivery and job site storage of all materials of this Section. Wood materials shall not be stored within the structure until work is reasonably dry. Store all carpentry materials in an area protected from weather, moisture and damage. Handle all products so as to prevent damage or soiling.

PART 2 – PRODUCTS

2.01 LUMBER

A. All lumber shall be from sound stock, thoroughly seasoned and free from defects. Moisture content of finish lumber shall not exceed 11%. Each piece of lumber must bear the grade and trademark of the association under which it is graded. Finish lumber for paint finish shall be B and better SPIB.

2.02 PLYWOOD

A. All plywood used in millwork shall conform to industry standards specified as follows:

1. APA interior grade A-D for surfaces exposed one side, ¾ inch thick, with exposed edges to receive ½ inch by ¾ inch solid stock edging.

2.03 PLASTIC LAMINATE

A. 1/16 thick, colors as selected by Engineer and/or Owner.

B. Full range of solid colors as produced by nationally recognized plastic laminate manufacturers shall be made available to Owner for color selections.

C. As manufactured by Wilson Art or Formica.

2.04 CABINETS

A. Shelves, Countertops, and Base Cabinets:

1. As indicated on drawings with wall and base cabinets being of essentially the same construction and of sizes indicated.
2. Cabinets to be provided with wood blocks and braces glued and stapled in place as necessary to assure sturdy rigid construction.
3. Base cabinets to have an integral 3 inch × 4 inch recessed toe kick.

B. Face Frame:

1. Cabinets constructed with front frame members of sound select softwood suitable for stained finish and of ¾ inch nominal thickness.
2. Frame members well jointed with joints glued and stapled.
3. Face frames drum sanded.

C. End Panels:

1. 1/2 inch softwood plywood where exposed.
2. 1/2 inch softwood plywood or particle board where concealed from view.
3. All ends machined or cleated to provide continuous support for shelves, back, bottom and top.

D. Backs:

1. 1/4 inch hardboard attached to minimum size ¾ inch × 3 ½ inch solid hanging rail which shall be rabbetted to receive back.

E. Shelves:

1. 3/4 inch solid wood or sound softwood plywood glued and stapled into dadoed or cleated cabinet ends.

F. Base Bottoms:

1. Softwood plywood let into end and backs.
2. Supported by lateral braces 16 inches o.c.

G. Drawers:

1. Equip each drawer with side mounted, full-extension, ball bearing, nylon roller drawer slides.
2. Complete as indicated on drawings.

H. Finish:

1. Exposed and interior surfaces of cabinets to receive field applied finish lightly sanded between coats.
2. Finish of all cabinets, doors, and shelves to be a natural stain as specified in Section 09900 or as indicated on the drawings.

I. Cabinet Hardware: Hardware for cabinets and shelving shall be as follows:

1. Shelf Standards and Brackets - K & V # 255 Standard and # 256 Support
2. Hinges - Self Closing Concealed
3. Pulls - 4" Brushed Chrome Wire
4. Drawer Guides - K & V # 1300

J. Countertops:

1. Countertops shall consist of two laminated layers of ¾" Sound Select Wood to assure sturdy rigid construction.

PART 3 – EXECUTION

3.01 GENERAL REQUIREMENTS

A. All finish carpentry shall conform to the latest edition of grade requirements of the A.W.I. Quality Standards.

B. All work of this Section shall be done by competent craftsmen in a neat workmanlike manner, equal to the highest grade of craftsmanship for the type of work involved.

C. All finish carpentry of every sort shall be put up plumb or level, and straight and true, no distortions. Shim using concealed shims.

D. In every case, put up trim and firmly secure to proper grounds. Fit and scribe all parts to other work in careful manner so as not to injure the surfaces in any way.

E. Blind nail wherever possible, but where not possible, drive and set nails so as to not be visible in the finish.

3.02 PROTECTIONS

A. All surfaces are to be left clean, ready for painting or staining and all damaged surfaces or items shall be repaired or replaced to the satisfaction of the ENGINEER. Protect all finish surfaces and hardware, including door knobs, rim locks, etc., until painting is completed.

3.03 APPLICATION OF HARDWARE

A. Receive, store and be responsible for all finished hardware. Properly tag, index and file all keys in key cabinet or as directed. Apply hardware in accordance with manufacturer's instructions, fit accurately, apply securely and adjust carefully. Use care not to injure work when applying hardware.

B. The location of hardware in connection with wood doors and metal doors bucks and wood frames shall be as follows unless otherwise shown on the Drawings: center door knob 38 inches above finished floor; center cylinder dead locks 46 inches above finished floor; located upper edge of top hinges 5 inches below head of frame; located lower edge of bottom hinges 10 inches above finished floor; space center hinges equal distance between top and bottom hinges.

3.04 CLEANING

A. Repair damage or defective work as directed.

B. After installation, CONTRACTOR shall clean all surfaces of dirt and remove all debris.

C. Adjust and lubricate hardware for proper operation.

END OF SECTION

SECTION 07100
BELOW GRADE VAPOR BARRIER

PART 1 - GENERAL

1.01 Furnish the below grade vapor barrier as specified herein and/or as indicated on the Drawings.

1.02 Section Includes

A. Surface preparation

B. Application of an underslab vapor retarder

1.03 Related Sections:

A. Section 03300 - Concrete

1.04 References

A. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials

B. ASTM E154 - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs

C. ASTM E1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs

D. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs

E. ASTM F1249-01 Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor

1.05 Submittals

A. Comply with Shop Drawing Submittals

B. Submit manufacturer's product data and application instructions

1.06 Quality Assurance

A. Use an experienced installer and adequate number of skilled personnel who are thoroughly trained and experienced in the application of the vapor retarder.

B. Obtain vapor retarder materials from a single manufacturer regularly engaged in manufacturing the product.

C. Provide products which comply with all state and local regulations controlling use of volatile organic compounds (VOCs).

1.07 Delivery, Storage, and Handling

A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Store materials in a clean, dry area in accordance with manufacturer's instructions.

C. Protect materials during handling and application to prevent damage.

1.08 Environmental Requirements

A. Product not intended for permanent exposure to the elements.

B. Do not apply on frozen ground.

PART 2 - PRODUCTS

2.01 Materials

A. Vapor Barrier shall have the following characteristics:

1. Minimum Thickness: **10 mils**
2. Minimum Permeance: **0.1 perms**
3. Minimum Tensile Strength: **30 lbf/in.**
4. Minimum Puncture Resistance: **1700 grams**
5. ASTM E 1745-09 Class: **B**

2.02 Accessories

A. Seam Tape – Adhesive or pressure-sensitive tape must have the same qualities as the vapor barrier and supplied by the same manufacturer. Minimum width: 4 inches.

PART 3 - EXECUTION

3.01 Application:

A. Install the vapor retarder membrane in accordance with manufacturer's instructions and ASTM E 1643–98.

B. Unroll vapor retarder with the longest dimension parallel with the direction of the pour.

C. Lap vapor retarder over footings and seal to foundation walls.

D. Overlap joints 6" and seal with manufacturer's tape.

E. Seal all penetrations (including pipes) with vapor barrier material and seal tape.

F. Repair damaged areas by cutting patches of vapor barrier, overlapping damaged area 6" and taping all four sides with tape.

END OF SECTION

SECTION 07145
CEMENTITIOUS CRYSTALLINE WATERPROOFING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes: Provide crystalline waterproofing for cast in place concrete.

1.2 DEFINITIONS

A. Crystalline waterproofing is a cementitious admixture or coating containing proprietary chemicals which, when placed in contact with the moisture and unhydrated cement in concrete, form nonsoluble crystals of dendritic fibers within the pores and capillary tracts of concrete.

1.3 SYSTEM

A. Xypex Waterproofing by Crystallization System, or approved equal.

1.4 SUBMITTALS

A. Product data: Submit manufacturer's product data and installation methods for each type of product required to demonstrate products comply with contract document.

1.5 QUALITY ASSURANCE

A. The installer shall be approved by the manufacturer of the waterproofing material.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Xypex Chemical Corporation, Xypex Concrete Waterproofing by Crystallization (Xypex Admix or prior approved equal.

B. Equivalent materials as approved by the engineer 10 days prior to acceptance of bids.

2.2 MIXES

A. The dosage rate for the Xypex Admix shall be a minimum of 15 lbs per yard. (higher dosage rates may be required to meet the performance requirements within this specification). No reduction in dosage rate will be considered.

2.3 PERFORMANCE REQUIREMENTS

A. *Testing Requirements*: Crystalline waterproofing system shall be tested in accordance with the following standards and conditions, and the testing results shall meet or exceed the performance requirements as specified herein. Independent tests verifying these results shall be submitted prior to approval.

B. Independent Laboratory: Testing shall be performed by an independent laboratory meeting the requirements of the recognized specifying body of the country in which the testing is performed. Testing laboratory shall obtain all concrete samples and waterproofing product samples.

C. Crystalline Formation: Crystallizing capability of waterproofing system shall be evidenced by independent SEM (Scanning Electron Microscope) photographs showing crystalline formations within the concrete matrix at a magnification no greater than 2000 times.

D. Permeability: Independent testing shall be performed according to U.S. Army Corps of Engineers CRD-C48 - Mod "Permeability of Concrete". Under CRD-C48 treated concrete samples that are no greater than 2 inches thick shall be pressure tested to 150 psi (350 foot head of water). The treated samples shall exhibit no measurable leakage against control samples which shall exhibit full saturation and measurable leakage. In all case cases treated and untreated samples shall have the same mix design.

E. DIN 1048/ EN 12390 "Water Impermeability of Concrete"/Requirement: Treated and untreated samples that are 120mm thick shall be subjected to hydrostatic pressure for 3 days (Minimum of 3 samples of each). Control samples shall have a minimum of 100mm of penetration (average of samples). Treated samples shall show a minimum of 90% reduction in depth of water penetration when compared to the control sample (average of samples). In all case cases treated and untreated samples shall have the same mix design.

F. Compressive Strength: Independent testing shall be performed according to ASTM C39 "Compressive Strength of Cylindrical Concrete Specimens". Concrete samples containing the crystalline waterproofing additive shall be tested against untreated control sample. At 28 days, the treated samples shall exhibit an increase in compressive strength over the control sample.

G. Crack Bridging Capability:
Requirement: Minimum of 0.4mm. Crack heal effect shall be supported by reports from recognized independent agency documenting crack healing effects of crystalline modified versus a control concrete in the same application.

PART 3 APPLICATION

3.1 MATERIALS PREPARATION

A. Xypex Admix must be added to the concrete at the time of batching. It is recommended that the Admix powder be added first to the rock and sand and blended thoroughly for 2 - 3 minutes before adding cement and water.

B. Blend total concrete mix using normal practices to ensure formation of homogeneous mixture.

C. For precast concrete manufacturers this usually means adding the Xypex into their pan type mixers.

D. For ready mix batch plants the Xypex Admix can be evenly distributed on a plant conveyor belt carrying the rock and sand, or the dry power Admix can be added to the truck first and then 30 - 50% of the required water for the concrete batch is dispensed along with 300 - 500 pounds of aggregate and mixed thoroughly for 2 - 3 minutes. The rest of the materials are then added to the truck and mixed for at least 5 minutes.

3.2 APPLICATION

A. Placement of concrete shall be in accordance with Section 03300 or Section 13010.

B. Retardation of set may occur when using Xypex Admix. The amount of retardation will depend upon the concrete mix design and the dosage rate of the admix. Consult with the manufacturer regarding proper dosage rate.

C. Concrete that contains Xypex Admix must be cured as per “Standard for Curing Concrete “ (ACI 308).

END OF SECTION

SECTION 07200
INSULATION

PART 1 - GENERAL

1.01 SCOPE: Provide all labor, materials, equipment and necessary related items to complete installation of insulation as specified herein and indicated on the drawings.

1.02 DELIVERY, HANDLING, AND STORAGE: Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Store with seals and labels intact and legible. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

A. CertainTeed Corporation
B. Guardian Building Products, Inc.
C. Johns Manville
D. Owens Corning

2.02 METAL BUILDING INSULATION:

A. The insulation shall be a North American Insulation Manufacturers Association (NAIMA) 202-96 flexible fiberglass metal building insulation as manufactured to conform with NAIMA 202-96 Standard and ASTM C991 Type 1. 6" (minimum)(R19) roof and 3" (mimimum)(R10) wall thickness required.

B. The insulation shall be faced with a vapor retarder having a permanence rating of not greater than 1.0 as tested in accordance with ASTM E96 Dessicant Method. ("VRR Plus" or equal)

C. The composite product shall have a fire hazard classification of 25 (maximum) flame spread index and 50 (maximum) smoke developed index (FHC 25/50) when used in accordance with ASTM E84 or UL 723.

D. The laminated insulation package shall be clearly labeled to indicate R-value and fire hazard classification 25/50. The blanket shall be marked on the un-faced side with the R-value and the NAIMA 202-96 identification.

2.03 FIBERGLASS BLANKET INSULATION:

A. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

B. Kraft-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type II (non-reflective faced), Class C (faced surface not rated for flame propagation); Category 1 (membrane is a vapor barrier).

C. Reinforced-Foil-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (reflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.

D. Foil-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (reflective faced), Class B (faced surface with a flame-propagation resistance of 0.12 W/sq. cm); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.

PART 3 - EXECUTION

3.01 GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.02 METAL BUILDING INSULATIONS:

A. Install metal building insulation with the vinyl backing between roof panels and sub framing at all roof areas and at vertical walls that are clad with metal.

3.03 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

B. Glass-Fiber Insulation: Install in cavities formed by framing members according to the following requirements:

1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.

2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members. Install without gaps or voids. Do not compress insulation.

3. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.

4. Within wall framing, install insulation between pipes and backside sheathing. Cut insulation material as required to fit around wiring and plumbing.

5. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.

6. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using a spray foam sealant according to the manufacturer's recommendations.

7. Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings, and seal each continuous area of insulation to ensure airtight installation.
   a.
   b. Exterior Walls: Set units with facing placed toward interior of construction

3.04 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

SECTION 07461
JAMES HARDIE SIDING

PART 1 – GENERAL

1.1 SECTION INCLUDES:

A. Fiber cement lap siding, panels, single, trim, fascia, moulding and accessories, James Hardie HZ5 Engineered for Climate Siding.

B. Factory-finished fiber cement lap siding, panels, single, trim, fascia, moulding and accessories, James Hardie HZ5 Engineered for Climate Siding.

1.2 RELATED SECTIONS

A. Section 05400 – Light Gage Metal Framing: Wall framing and bracing.

B. Section 06100 – Rough Carpentry: Wood framing and bracing.

C. Section 06100 – Rough Carpentry: Sheathing.

D. Section 07200 – Insulation: Exterior wall insulation.

1.3 REFERENCES

A. ASTM C1186 – Standard Specification for Flat Fiber-Cement Sheets.

B. ASTM D3359 – Standard Test Method for Measuring Adhesion by Tape Test, Tool and Tape.

C. ASTM E136 – Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Shop Drawings: Provide detailed drawings of atypical non-standard applications of cementitious siding materials which are outside the scope of the standard details and specifications provided by the manufacturer.

D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, two samples, minimum size 4 by 6 inches (100 by 150 mm), representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Minimum of 2 years experience with installation of similar products.

B. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
1. Finish areas designated by Architect.
2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store siding on edge or lay flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.

C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

A. Product Warranty: Limited, non-pro-rated product warranty.
1. HardiePlank HZ5 lap siding for 30 years.
2. HardiePanel HZ5 vertical siding for 30 years.
3. HardieSoffit HZ5 panels for 30 years.
4. HardieShingle HZ5 siding for 30 years.
5. Artisan HZ5 lap siding for 30 years.

B. Product Warranty: Limited, product warranty.
   1. HardieTrim HZ and HZ5 boards for 15 years.

C. Finish Warranty: Limited product warranty against manufacturing finish defects.
   1. When used for its intended purpose, properly installed and maintained according to James Hardie's published installation instructions, James Hardie's ColorPlus Technology, for a period of 15 years from the date of purchase: will not peel; will not crack; and will not chip. Finish warranty includes the coverage for labor and material.

D. Workmanship Warranty: Application limited warranty for 2 years.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: James Hardie Building Products, Inc. which is located at: 26300 La Alameda Suite 400; Mission Viejo, CA 92691; Toll Free Tel: 866-274-3464; Tel: 949-367-4980; Email: request info (info@jameshardie.com); Web: www.jameshardiecommercial.com

B. Substitutions: Not permitted.

C. Requests for approval of equal substitutions will be considered in accordance with provisions of Section 01600.

2.2 SIDING

A. HardiePlank HZ5 lap siding, HardiPanel HZ5 vertical siding, HardieSoffit HZ5 panels and HardieShingle HZ5 siding requirements for Materials:
   1. Fiber-cement Siding – complies with ASTM C 1186 Type A Grade II.
   2. Fiber-cement Siding – complies with ASTM E 136 as a noncombustible material.
   3. Fiber-cement Siding – complies with ASTM E 84 Flame Spread Index = 0, Smoke Developed Index = 5.
   4. CAL-FIRE, Fire Engineering Division Building Materials Listing – Wildland Urban Interface (WUI) Listed Product.
   5. National Evaluation Report No. NER 405 (BOCA, ICBO, SBCCI, IBC, IRC).
   6. City of Los Angeles, Research Report No. 24862.
   7. Miami Dade County, Florida Notice of Acceptance 07-0418.04.
   8. US Department of Housing and Urban Development Materials Release 1263d.

9. California DSA PA-019.
10. City of New York M EA 223-93-M.
11. Florida State Product Approval FL889.
12. Texas Department of Insurance Product Evaluation EC-23.

B. Artisan HZ5 lap siding requirements for Materials:
1. Fiber-cement Siding – complies with ASTM C 1186 Type A Group II.
2. Fiber-cement Siding – complies with ASTM E 136 as a noncombustible material.
3. Fiber-cement Siding – complies with ASTM E 84 Flame Spread Index = 0, Smoke Developed Index = 5.
4. Warnock Hersey Product Listing.
5. CAL-FIRE, Fire Engineering Division Building Materials Listing – Wildland Urban Interface (WUI) Listed Product.
6. Florida State Product Approval FL 10477.
7. Miami Dade County, Florida Notice of Acceptance 08-0514.11.
8. Texas Department of Insurance Product Evaluation EC-55.
9. Manufacturer's Technical Data Sheet.

C. Lap Siding: Artisan HZ5 Lap Siding as manufactured by James Hardie Building Products, Inc.
1. Type: Smooth 5-1/4 inches (133 mm) with 4 inches (102 mm) exposure.
2. Type: Smooth 7-1/4 inches (184 mm) with 6 inches (152 mm) exposure.
3. Type: Smooth 8-1/4 inches (210 mm) with 7 inches (178 mm) exposure.
4. Type: Texture 5-1/4 inches (133 mm) with 4 inches (102 mm) exposure.
5. Type: Texture 7-1/4 inches (184 mm) with 6 inches (152 mm) exposure.
6. Type: Texture 8-1/4 inches (210 mm) with 7 inches (178 mm) exposure.

D. Lap Siding: HardiePlank HZ5 Lap siding with a sloped top, beveled drip edge and nailing line as manufactured by James Hardie Building Products, Inc.
1. Type: Smooth 5-1/4 inches (133 mm) with 4 inches (102 mm) exposure.
2. Type: Smooth 6-1/4 inches (159 mm) with 5 inches (127 mm) exposure.
3. Type: Smooth 7-1/4 inches (184 mm) with 6 inches (152 mm) exposure.
4. Type: Smooth 8-1/4 inches (210 mm) with 7 inches (178 mm) exposure.
5. Type: Smooth 9-1/4 inches (235 mm) with 8 inches (203 mm) exposure.
6. Type: Smooth 12 inches (305 mm) with 10-3/4 inches (273 mm) exposure.
7. Type: Select Cedarmill 5-1/4 inches (133 mm) with 4 inches (102 mm) exposure.
8. Type: Select Cedarmill 6-1/4 inches (159 mm) with 5 inches (127 mm) exposure.
9. Type: Select Cedarmill 7-1/4 inches (184 mm) with 6 inches (152 mm) exposure.

10. Type: Select Cedarmill 8-1/4 inches (210 mm) with 7 inches (178 mm) exposure.

E. Lap Siding: HardiePlank HZ5 Lap siding as manufactured by James Hardie Building Products, Inc.
   1. Type: Beaded Smooth 8-1/4 inches (210 mm) with 7 inches (178 mm) exposure.
   2. Type: Beaded Cedarmill 8-1/4 inches (210 mm) with 7 inches (178 mm) exposure.

F. Vertical Siding: HardiePanel HZ5 siding as manufactured by James Hardie Building Products, Inc.
   1. Type: Smooth Vertical siding panel 4 feet by 8 feet (1219 mm by 2438 mm).
   2. Type: Smooth Vertical siding panel 4 feet by 9 feet (1219 mm by 2743 mm).
   3. Type: Smooth Vertical siding panel 4 feet by 10 feet (1219 mm by 3048 mm).
   4. Type: Cedarmill Vertical siding panel 4 feet by 8 feet (1219 mm by 2438 mm).
   5. Type: Cedarmill Vertical siding panel 4 feet by 9 feet (1219 mm by 2743 mm).
   6. Type: Cedarmill Vertical siding panel 4 feet by 10 feet (1219 mm by 3048 mm).
   7. Type: Stucco Vertical siding panel 4 feet by 8 feet (1219 mm by 2438 mm).
   8. Type: Stucco Vertical siding panel 4 feet by 9 feet (1219 mm by 2743 mm).
   9. Type: Stucco Vertical siding panel 4 feet by 10 feet (1219 mm by 3048 mm).
   10. Type: Sierra 8 inches (203 mm) Vertical siding panel 4 feet by 8 feet (1219 mm by 2438 mm).
   11. Type: Sierra 8 inches (203 mm) Vertical siding panel 4 feet by 9 feet (1219 mm by 2743 mm).
   12. Type: Sierra 8 inches (203 mm) Vertical siding panel 4 feet by 10 feet (1219 mm by 3048 mm).

G. Shingle Siding: HardieShingle HZ5 siding as manufactured by James Hardie Building Products, Inc.
   1. Type: HardiShingle Individual Shingles 6 inches (152 mm) wide by 18 inches (457 mm) high with 8 inches (203 mm) exposure.
   2. Type: HardiShingle Individual Shingles 8 inches (203 mm) wide by 18 inches (457 mm) high with 8 inches (203 mm) exposure.
   3. Type: HardiShingle Individual Shingles 12 inches (305 mm) wide by 18 inches (457 mm) high with 8 inches (203 mm) exposure.
   4. Type: HardieShingle Straight-Edge Notched Panel 48 inches (1219 mm) wide by 16 inches (406 mm) high with 7 inches (178 mm) exposure.
   5. Type: HardieShingle Staggered-Edge Notched Panel 48 inches (1219 mm) wide by 16 inches (406 mm) high with 7 inches (178 mm) exposure.
   6. Type: HardieShingle Half Round Notched Panel 48 inches (1219 mm) wide by 19 inches (483 mm) high with 7 inches (178 mm) exposure.

H. Trim:

1. HardieTrim HZ5 boards and HardieTrim HZ boards as manufactured by James Hardie Building Products, Inc.
2. HardieTrim HZ5 Fascia boards as manufactured by James Hardie Building Products, Inc.
3. HardieTrim HZ5 Crown moulding manufactured by James Hardie Building Products, Inc.
4. Artisan HZ5 Accent trim as manufactured by James Hardie Building Products, Inc.

2.3 FASTENERS

A. Wood Framing Fasteners:
1. Wood Framing: 4d common corrosion resistant nails.
2. Wood Framing: 6d common corrosion resistant nails.
3. Wood Framing: 8d box ring common corrosion resistant nails.
4. Wood Framing: 0.089 inch (2.2 mm) shank by 0.221 inch (5.6 mm) head by 2 inches (51 mm) corrosion resistant siding nails.
5. Wood Framing: 0.093 inch (2.4 mm) shank by 0.222 inch (5.6 mm) head by 2 inches (51 mm) corrosion resistant siding nails.
6. Wood Framing: 0.093 inch (2.4 mm) shank by 0.222 inch (5.6 mm) head by 2-1/2 inches (64 mm) corrosion resistant siding nails.
7. Wood Framing: 0.091 inch (2.3 mm) shank by 0.221 inch (5.6 mm) head by 1-1/2 inches (38 mm) corrosion resistant siding nails.
8. Wood Framing: 0.091 inch (2.3 mm) shank by 0.225 inch (5.7 mm) head by 1-1/2 inches (38 mm) corrosion resistant siding nails.
9. Wood Framing: 0.121 inch (3 mm) shank by 0.371 inch (9.4 mm) head by 1-1/4 inches (32 mm) corrosion resistant roofing nails.
10. Wood Framing: No. 11 gauge 1-1/4 inches (32 mm) corrosion resistant roofing nails.
11. Wood Framing: No. 11 gauge 1-1/2 inches (38 mm) corrosion resistant roofing nails.
12. Wood Framing: No. 11 gauge 1-3/4 inches (44 mm) corrosion resistant roofing nails.

B. Metal Framing:
1. Metal Framing: 1-1/4 inches (32 mm) No. 8-18 by 0.375 inch (9.5 mm) head self-drilling, corrosion resistant S-12 ribbed buglehead screws.
2. Metal Framing: 1-5/8 inches (41 mm) No. 8-18 by 0.323 inch (8.2 mm) head self-drilling, corrosion resistant S-12 ribbed buglehead screws.
3. Metal Framing: 1 inch (25 mm) No. 8-18 by 0.323 inch (8.2 mm) head self-drilling, corrosion resistant S-12 ribbed buglehead screws.
4. Metal Framing: 1 inch (25 mm) No. 8-18 by 0.311 inch (7.9 mm) head self-drilling, corrosion resistant S-12 ribbed buglehead screws.
5. Metal Framing: 1.5 inch (38 mm) [AGS-100]. 100 inches by 25 inches (2540 mm by 635 mm) ET&F Pin or equivalent pneumatic fastener.

C. Masonry Walls (CMU):
   1. Masonry Walls: Aerico Stud Nail, ET&F ASM No.-144-125, 0.14 inch (3.6 mm) shank by 0.30 inch (7.6 mm) head by 2 inches (51 mm) long corrosion resistant nails.

2.4 FINISHES

A. Factory Primer: Provide factory applied universal primer.
   1. Primer: Factory primed by James Hardie.
   2. Topcoat: Refer to Section 09900 and Exterior Finish Schedule.

B. Factory Finish: Refer to Exterior Finish Schedule
   1. Product: ColorPlus Technology by James Hardie.
   2. Definition: Factory applied finish; defined as a finish applied in the same facility and company that manufacturers the siding substrate.
   3. Process:
      a. Factory applied finish by fiber cement manufacturer in a controlled environment within the fiber cement manufacturer's own facility utilizing a multi-coat, heat cured finish within one manufacturing process.
      b. Each finish color must have documented color match to delta E or 0.5 or better between product lines, manufacturing lots or production runs as measured by photospectrometer and verified by third party.
   4. Protection: Factory applied finish protection such as plastic laminate that is removed once siding is installed.
   5. Accessories: Complete finishing system includes pre-packaged touch-up kit provided by fiber cement manufacturer. Provide quantities as recommended by manufacturer.

C. Factory Finish Color for Trim, Soffit and Siding Colors:
   1. Alpine Frost JH50-10.
   2. Arctic White JH10-20.
   3. Autumn Tan JH20-20.
   4. Boothbay Blue JH70-20.
   5. Chestnut Brown JH80-30.
   6. Cobble Stone JH40-10.
   7. Countrylane Red JH90-20.
   8. Evening Blue JH70-30.
   9. Frosted Green JH60-20.
   10. Harris Cream JH80-10.
   11. Heathered Moss JH50-20.
   12. Iron Gray JH90-30.
   13. Khaki Brown JH20-30.
   14. Light Mist JH70-10.

15. Monterey Taupe JH40-20.
16. Mountain Sage JH50-30.
17. Navajo Beige JH30-10.
18. Parkside Pine JH60-30.
19. Sail Cloth JH20-10.
20. Sandstone Beige JH30-20.
21. Soft Green JH60-10.
22. Timber Bark JH40-30.
23. Traditional Red JH90-10.
24. Tuscan Gold JH80-20.
25. Woodland Cream JH10-30.
26. Woodstock Brown JH30-30.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If framing preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Nominal 2 inch by 4 inch (51 mm by 102 mm) wood framing selected for minimal shrinkage and complying with local building codes, including the use of water-resistive barriers or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.
   1. Install water-resistive barriers and claddings to dry surfaces.
   2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.
   3. Protect siding from other trades.

D. Minimum 20 gauge 3-5/8 inch (92 mm) C-Stud 16 inches maximum on center or 16 gauge 3-5/8 inches (92 mm) C-Stud 24 inches (610 mm) maximum on center metal framing complying with local building codes, including the use of water-resistive barriers and/or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.
   1. Install water-resistive barriers and claddings to dry surfaces.
   2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.
   3. Protect siding from other trades.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Install a water-resistive barrier is required in accordance with local building code requirements.

D. The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements.

E. Install Engineered for Climate TM HardieWrap TM weather barrier in accordance with local building code requirements.

F. Use HardieWrap TM Seam Tape and joint and laps.

G. Install HardieWrap TM flashing, and HardieWrap TM Flex Flashing.

3.3 INSTALLATION – HARDIEPLANK HZ5 LAP SIDING AND ARTISAN HZ5 LAP SIDING

A. Install materials in strict accordance with manufacturer's installation instructions.

B. Starting: Install a minimum ¼ inch (6 mm) thick lath starter strip at the bottom course of the wall. Apply planks horizontally with minimum 1-1/4 inches (32 mm) wide laps at the top. The bottom edge of the first plank overlaps the starter strip.

C. Allow minimum vertical clearance between the edge of siding and any other material in strict accordance with the manufacturer's installation instructions.

D. Align vertical joints of the planks over framing members.

E. Maintain clearance between siding and adjacent finished grade.

F. Locate splices at least one stud cavity away from window and door openings.

G. Wind Resistance: Where a specified level of wind resistance is required Hardieplank lap siding is installed to framing members and secured with fasteners described in Table No. 2 in National Evaluation Service Report No. NER-405.

H. Locate splices at least 12 inches (305 mm) away from window and door openings.

3.4 INSTALLATION – HARDIEPANEL HZ5 VERTICAL SIDING

A. Install materials in strict accordance with manufacturer's installation instructions.

B. Block framing between studs where HardiePanel siding horizontal joints occur.

C. Install metal Z flashing and provide a ¼ inch (6 mm) gap at horizontal panel joints.

D. Place fasteners no closer than 3/8 inch (9.5 mm) from panel edges and 2 inches (51 mm) from panel corners.

E. Allow minimum vertical clearance between the edge of siding and any other material in strict accordance with the manufacture's installation instructions.

F. Maintain clearance between siding and adjacent finished grade.

G. Specific framing and fastener requirements refer to Tables 2 and 3 in National Evaluation Service Report No. NER-405.

H. Factory Finish Touch Up: Apply touch up paint to cut edges in accordance with manufacturer's printed instructions.
   1. Touch-up nicks, scrapes, and nail heads in pre-finished siding using the manufacturer's touch-up kit pen.
   2. Touch-up of nails shall be performed after application, but before plastic protection wrap is removed to prevent spotting of touch-up finish.
   3. Use touch-up paint sparingly. If large areas require touch-up, replace the damaged area with ne pre-finished siding. Match touch up color to siding color through use of manufacturer's branded touch-up kits.

3.5 INSTALLATION – HARDIE HZ5 SHINGLESIDE CLADDING

A. Install materials in strict accordance with manufacturer's installation instructions.

B. Substrate: Install a minimum 7/16 inch (11 mm) thick OSB wall sheathing or equivalent braced walls complying with applicable building codes.

C. Starting: Install a minimum ¼ inch (6 mm) thick lath starter strip at the bottom course of the wall.

D. Maintain clearance between siding and adjacent finished grade.

E. Apply starter course of 10 inches (254 mm) shingles or 9-1/2 inches (241 mm) lap siding overlapping the starter strip.

F. Apply subsequent courses horizontally with a minimum 10 inch overlap at the top and a minimum 2 inch (51 mm) side lap. The bottom edge of the first two courses overlaps the starter strip.

G. Fasten between ½ inch (13 mm) and 1 inch (25 mm) in from the side edge and between 8-1/2 inches (216 mm) and 9 inches (229 mm) up from the shingle bottom edge.

H. Allow minimum vertical clearance between the edge of siding and any other material in strict accordance with the manufacturer's installation instructions.

I. Ensure vertical joints of overlapping shingle course do not align.

J. Wind Resistance: Where a specified level of wind resistance is required, Hardie Shingle siding is installed to substrate and secured with a minimum two fasteners described in Table No. 6, 7 and 8 in National Evaluation Service Report No. NER-405.

3.6 INSTALLATION – HARDIETRIM HZ5 BOARDS

A. Install materials in strict accordance with manufacturer's installation instructions. Install flashing around all wall openings.

B. Fasten through trim into structural framing or code complying sheathing. Fasteners must penetrate minimum ¾ inch (19 mm) or full thickness of sheathing. Additional fasteners may be required to ensure adequate security.

C. Place fasteners no closer than ¾ inch (19 mm) and no further than 2 inches (51 mm) from side edge of trim board and no closer than 1 inch (25 mm) from end. Fasten maximum 16 inches (406 mm) on center.

D. Maintain clearance between trim and adjacent finished grade.

E. Trim inside corner with a single board trim both sides of corner.

F. Outside Corner Board Attach Trim on both sides of corner with 16 gage corrosion resistant finish nail ½ inch (13 mm) from edge spaced 16 inches (406 mm) apart, weather cut each end spaced minimum 12 inches (305 mm) apart.

G. Allow 1/8 inch gap between trim and siding.

H. Seal gap with high quality, paint-able caulk.

I. Shim frieze board as required to align the corner trim.

J. Fasten through overlapping boards. Do not nail between lap joints.

K. Overlay siding with single board of outside corner board then align second corner board to outside edge of first corner board. Do not fasten HardieTrim boards to HardieTrim boards.

L. Shim frieze board as required to align with corner trim.

M. Install HardieTrim Fascia boards to rafter trails or to sub fascia.

3.7 FINISHING

A. Finish unprimed siding with a minimum one coat high quality, alkali resistant primer and on coat of either, 100 per cent acrylic or latex or oil based, exterior grade topcoats or two cots high quality alkali resistant 100 percent acrylic or latex, exterior grade topcoat within 90 days of installation. Follow paint manufacturer's written product recommendation and written application instructions.

B. Finish factory primed siding with a minimum of one coat of high quality 100 percent acrylic or latex or oil based exterior grade paint within 180 days of installation. Follow paint manufacturer's written product recommendation and written application instructions.

3.8 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

SECTION 07600
FLASHING AND SHEET METAL

PART 1 - GENERAL

A. SCOPE: Provide all labor, materials, equipment and appurtenances necessary to comply with the drawings and these specifications for the installation of metal flashing.

B. RELATED WORK SPECIFIED ELSEWHERE:

1. Metal Roofing – Section 05600
2. Sealants and Caulking - Section 07920

C. SHOP DRAWINGS AND SAMPLES: Provide samples of slashing materials and systems components to be used on this project.

D. QUALITY STANDARDS: All flashing and sheet metal work shall be done in accordance with the recommendations of SMACNA, approved shop drawings and manufacturer's specifications.

PART 2 - PRODUCTS

A. METAL ROOF AND WALL FLASHING: Shall be as specified in sections listed above.

PART 3 - EXECUTION

A. GENERAL: Flashing work that is exposed to view shall be installed with no raw edges in a neat appearance as approved by the Owner. Install metal flashing as indicated on the drawings and as necessary to obtain a weather-tight condition. Flash continuously around internal and external corners. Sheet metal work shall be watertight with lines, arises and angles sharp and true and plans surfaces free from waves and buckles.

B. ROOF OPENINGS: Where base flashing is placed at roof openings, provide metal cap flashing where roof mounted items do not have attached counter-flashing.

C. VENT FLASHING: All pipes passing through the roof shall be flashed and counterflashed. Secure base of flashing in full bed of mastic all around.

D. CLEANING: Clean all sheet metal work of all dirt and stains and leave in a neat and secure condition.

END OF SECTION

SECTION 07920
SEALANTS AND CAULKINGS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Applicable provisions of Instructions to Bidders, General and Supplementary Conditions, govern work under this section.

1.02 COORDINATION WITH OTHER TRADES

A. Cooperate in placement of materials with other trades so that required areas of work will be scheduled properly.

1.03 SUBMITTALS

A. Submit samples of materials, manufacturer's literature, and specifications data of materials to be employed in accordance with Section 01340 of Specifications. Color selection by Professional.

1.04 DELIVERY AND STORAGE

A. Deliver materials to site in manufacturer's original sealed containers.

B. Store materials in location that will adequately protect goods from weather and damage.

PART 2 - PRODUCTS

2.01 GENERAL

A. Caulking compound shall be a plastic material, light in color, weatherproof, stainproof, and shall not be affected by long exposure to extreme temperatures.

B. Caulking compound shall gradually form a tough, thick skin on exposed surface, but underneath shall remain plastic indefinitely. Material shall not crack, sag nor become brittle.

C. Caulking compound shall adhere tenaciously to materials it comes in contact with and shall not adversely affect paint applied thereto.

2.02 MATERIALS

A. Primer:

1. Compatible with substrate, sealant.

2. Furnished by sealant manufacturer.

B. Exterior Construction Sealant:

1. Federal Specification TT-S0015443A (General Electric - Silpruf Silicone Weatherproof Sealant)

C. Glazing Sealant:

1. Federal Specification TT-S0991543A (General Electric - Silicone Construction 1200 Sealant)

D. Caulking Compound:

1. Oleo-resinous, gun-grade, non-staining, plastic compound conforming to Federal Specification TT-C598, current edition.

E. Joint Package:

1. Synthetic sponge, non-reactive with caulking materials, non-oily. Minimum density 3.25 lbs./cubic foot. Asphalt or bitumen impregnated fibers not acceptable.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Joint Preparation:

1. Clean all joints; blow out or vacuum away loose particles.

2. Joints shall be dry, fully cured, free of loose aggregate, curing compounds, water repellant, paint or other surface treatment.

B. Joint Packing:

1. Packing sized to require 20-50 percent compression upon insertion.

2. Place packing so that sealant depth is approximately one-half joint width.

3. Where joint depth does not require packing, install polyethylene bond - break tape at joint back.

4. Avoid lengthwise stretching of packing material.

C. Masking:

1. Mark where required to protected adjacent surfaces.

2. Remove immediately once joint sealant has been tooled.

D. Priming Joints:

1. Follow manufacturer's instruction;

2. Brush uniformly all surfaces of joint.

E. Sealant Application:

1. Follow manufacturer's instructions.

2. Do not exceed manufacturer's recommended potential open time (POT life).

3. Apply under pressure to prevent air pockets and voids.

4. Tool where required with solvent of manufacturer's recommendation.

3.02 LOCATION OF SEALANT AND CAULKING

A. Apply where indicated on plans.

B. Apply sealant if not specifically called out on Drawings at:

1. Floor slab penetrations, exterior wall penetrations

2. Openings for piping, conduit, ductwork

3. Changes in plane of similar materials

4. Joints where dissimilar materials meet

3.03 SETTING THRESHOLDS

A. Set thresholds in full bed of caulking compound; upon setting remove excess material.

3.04 CLEANING

A. Clean adjacent surfaces clean of sealant using solvent or cleaning agent as recommended by manufacturer.

B. Remove all tools, trash, debris once work has been completed.

END OF SECTION

SECTION 09900
PAINTING

PART 1 - GENERAL

1.01 SECTION INCLUDES

Surface preparation and field application of paints and coatings.

1.02 REFERENCES

A. ASTM D16 - Definitions of Terms Relating to Paint, Varnish, Lacquer and Related Products.

B. NPCA (National Paint and Coatings Association) - Guide to U.S. Government Paint Specifications.

C. PDCA (Painting and Decorating Contractors of America) - Painting - Architectural Specifications Manual.

1.03 DEFINITIONS

Conform to ASTM D16 for interpretation of terms used in this Section.

1.04 SUBMITTALS

A. Product Data: Provide data on all finishing products.

B. Samples: Submit two samples illustrating range of colors and textures available for each surface finishing product scheduled.

C. Manufacturer's instructions: Indicate special surface preparation procedures and substrate conditions requiring special attention.

1.05 QUALIFICATIONS

Application: Company specializing in performing the work of this Section with minimum three years documented experience.

1.06 REGULATORY REQUIREMENTS

Conform to applicable code for flame and smoke rating requirements for finishes.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container label to include manufacturer's name, type of paint, brand name, lot

number, brand code, coverage, surface preparation, drying time, cleanup requirement, color designation, and instructions for mixing and reducing.

C. Store paint materials at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Minimum Application Temperatures for Latex Paints: 45 degrees F (7 degrees C) for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

C. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.

D. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

1.09 EXTRA MATERIALS

A. Provide 1 gallon of each color, type, and surface texture to Owner.

B. Label each container with color, type, texture, and room locations in addition to the manufacturer's label.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Sherwin Williams.

B. Benjamin Moore.

C. Devoe.

2.02 MATERIALS

A. Coatings: Ready mixed, except field catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating; good flow and brushing properties; capable of drying or curing free of streaks or sags.

B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve specified, of commercial

quality.

C. Patching Materials: Latex filler.

D. Fastener Head Cover Materials: Latex filler.

E. Primer: Use product produced by same manufacturer as finish coats, or as recommended by the finish coat manufacturer for the surface application. Follow paint schedule below.

2.03 FINISHES

A. Refer to schedule at end of section for surface finish.

B. Colors shall be selected by Owner and/or Engineer.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

C. Test shop applied primer for compatibility with subsequent cover materials.

D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:

1. Plaster and Gypsum Wallboard: 12 percent.

2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.

3. Interior Wood: 15 percent, measured in accordance with ASTM D2016.

3.02 PREPARATION

A. Remove electrical plates, hardware, light fixture trim, escutcheons, an fittings prior to preparing surfaces of finishing.

B. Correct defects and clean surfaces which affect work of this section.

C. Seal marks which may bleed through surface finishes.

D. Do not paint over rust, dirt, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.

E. Gypsum Board Surfaces: Fill minor defects with filler compounds. Spot prime defects after repair.

F. Concrete and Unit Masonry Surface Scheduled to Receive Paint Finish: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

G. Plaster Surfaces: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.

H. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make tough-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.

I. Interior Wood Items Scheduled to Receive Finish:

1. Wipe off dust and grit prior to priming.

2. Prime, stain, or seal wood required to be job-painted immediately upon delivery to job. Prime edges, ends, faces, undersides, and backsides of such wood.

3. Seal knots, pitch streaks, and sappy sections with sealer.

4. Fill nail holes and cracks after primer has dried; sand between coats.

3.03 APPLICATION

A. Apply products in accordance with manufacturer's instructions.

B. Do not apply finishes to surfaces that are not dry.

C. Apply each coat to uniform finish.

D. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.

E. Sand wood and metal lightly between coats to achieve required finish.

F. Vacuum clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.

G. Allow applied coat to dry before next coat is applied.

H. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

I. Prime concealed surfaces of interior woodwork with primer paint.

J. Prime concealed surfaces of interior woodwork scheduled to receive stain or varnish finish with gloss varnish reduced to 25 percent with mineral spirits.

3.04 CLEANING

A. Clean work under provisions of 01710.

B. Collect waste material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

3.05 FINISH SCHEDULE

(Unless otherwise noted, product numbers refer to Sherwin Williams.)

The following specification for finishing is not intended to mention every particular item which will receive painter's finish. It is intended to establish procedure, quality and number of coats; the Engineer will determine the exact finish desired. Do not start priming or painting without having notified the Engineer. All paint coats specified herein are in addition to any prime coat which may already be on surface.

The kinds of paint and number of coats required on the various surfaces shall be as follows:

A. Exterior Surfaces

1. Exterior Wood:

First Coat	A100 Alkyd Wood Undercoat Y24W20
Second Coat	Superpaint Latex Gloss A89 Series
Third Coat	Superpaint Latex Gloss A89 Series

2. Exterior Metal (non-galvanized):

First Coat	Shop Primed
Second Coat	Industrial Enamel B54 Series
Third Coat	Industrial Enamel B54 Series

3. Exterior Galvanized Metal:

First Coat	Galvite HS B50WZ30
Second Coat	Industrial Enamel B54 Series
Third Coat	Industrial Enamel B54 Series

Note: Allow recommended weathering time or pre-treat metal as recommended by manufacturer.

4. Painted Exterior Concrete:

First Coat	Loxon Acrylic Primer A24W300
Second Coat	Satin A89 Series
Third Coat	Satin A89 Series

5. Sealed Concrete Slabs:

H & C Clear 23 Sealer, or equivalent

6. Exterior Concrete Block:

First Coat	Preprite Interior/Exterior Block Filler B25W25
Second Coat	Satin A89 Series
Third Coat	Satin A89 Series

B. Interior Surfaces

1. Interior Ferrous Metal:

First Coat	Shop Primed
Second Coat	Promar 200 Alkyd Gloss B35 Series
Third Coat	Promar 200 Alkyd Gloss B35 Series

2. Interior Drywall:

First Coat	Preprite 200 Latex Primer B28W200
Second Coat	Promar 200 Latex Eg-Shell B20 Series
Third Coat	Promar 200 Latex Eg-Shell B20 Series

3. Painted Interior Wood:

First Coat	Preprite Wall and Wood Primer B49W2
Second Coat	Promar 200 Alkyd Gloss B35 Series
Third Coat	Promar 200 Alkyd Gloss B35 Series

4. Stained Interior Wood:

First Coat	Oil Stain (Optional Depending On Finish Desired)
Second Coat	Lacquer Vinyl Sealer T67FH27
Third Coat	Cab-Acrylic Lacquer T75FH55

5. Concrete (Painted):

First Coat	Preprite Masonry Primer B28W300
Second Coat	Promar 200 Latex Eg-Shell B20 Series
Third Coat	Promar 200 Latex Eg-Shell B20 Series

6. Concrete Slabs (Clear Sealer):

H & C Clear 23 Sealer, or equivalent

7. Concrete Slabs (Slip Resistant Coating):

Waterbased tile-clad epoxy finish with H & C SharkGrip Slip Resistant Additive

8. Interior Concrete Block:

First Coat	Preprite Interior/Exterior Block Filler B25W25
Second Coat	Promar 200 Latex Semi-Gloxx B31 Series
Third Coat	Promar 200 Latex Semi-Gloxx B31 Series

END OF SECTION

SECTION 09950
PROTECTIVE LININGS

PART 1 – GENERAL

1.01 SCOPE– This section of the specifications contains the detailed criteria for the selection of materials, surface preparation, and the furnishing of all paint, labor, and equipment for field application to all interior surfaces of the concrete tank.

1.02 PRE-JOB CONFERENCE – There will be a mandatory pre-job meeting to discuss the technical aspects of the specified coatings, the project site, and the application characteristics of the specified products. A ventilation plan will be required to insure that personnel are adequately protected during application of the coating. Contractor shall supply a list of the PPE required during coating application and if entry is made by personnel for testing and inspection purposes in between coats.

1.03 SUBMITTALS

A. Contractor shall submit the following information

1. Coating Schedule
2. Performance Data
3. Material Safety Data Sheets for any chemicals other than the specified coating that will be brought on site.

1.04 DELIVERY, STORAGE AND HANDLING

A. All materials, delivered to job-site, shall be in original sealed and labeled containers of the paint manufacturer.
B. Store materials in a protected area at a temperature between 75°-95° F
C. All coatings and paint shall be stored in enclosed structures to protect them from weather and excessive heat or cold. Flammable coatings or paint must be stored to conform to City, Parish, State and Federal safety codes for flammable coating or paint materials. At all times, coatings and paints shall be protected from freezing.
D. In order to protect the environment, care shall be taken when handling, mixing, applying, etc. the coating. Measures shall be taken by the contractor to ensure that no quantity of material is allowed to reach the ground by spillage or atomization.

1.05 PROJECT CONDITIONS

A. Environmental Requirements
   1. Interior Coating Application (Dehumidification Required)
      a. Coatings shall be applied during good painting weather.
      b. Air and surface temperatures shall be between 60° F and 120°F.
      c. Surface temperature shall be at least 5° F above dew point.
      d. Relative humidity shall be below 80%.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS MATERIALS –

A. Except as otherwise specified herein or as specifically approved by the Engineer, all materials shall be products of the following manufacturer; subject, however, in compliance with specification requirement:

1. Tnemec Company, Inc. or prior approved equal

2. Products for each specified function and system shall be of a single manufacturer.

B. Bidders desiring to use products other than those specified shall submit their proposal in writing to the engineer at least ten (10) days prior to the bid opening. Requests for substitution shall include manufacturer's literature for each product giving the name, generic type, descriptive information, solids by volume, recommended dry film thickness and a list of five projects where each product has been used and rendered satisfactory service. No request for substitution shall be considered that would decrease thickness, the number of coats applied or offer a change in the generic type of coating specified. The coating contractor shall submit manufacturer's certified test reports showing that the substitute product(s) equal or exceed the performance of the specified products. The coating contractor shall supply a cured sample of the proposed system to the architect to verify the manufacturer is capable of providing orange peel finish.

PART 3 – EXECUTION

3.01 SURFACE PREPARATION -

A. Concrete Floors & Walls

1. Vacuum clean concrete to remove all dirt, dust, and other loose materials.
2. Rout a ¼" Wide x 1/8"Deep groove in all cracks that are 1/32" of an inch or greater.
3. Abrasive blast all surfaces to be coated to open all voids and bugholes and to achieve a surface profile equivalent to ICRI CSP 5.
4. Verify dryness by testing for moisture with a "plastic film tape-down test". (Reference ASTM D4263) and Calcium Chloride tests (ASTM F 1869). If moisture levels are in excess of the coating manufacturer, do not proceed with the application and contact the manufacturer's representative.
5. After mechanically abrading, verify that all surfaces are clean, dry and free of any contaminants, which could adversely affect the adhesion of the system.

3.02 APPLICATION –

A. General
1. All materials shall be applied in accordance with manufacturer's directions.
2. All materials shall be applied under adequate illumination.
3. No painting or finishing shall be done under environmental conditions which could change significantly during the initial stages of the curing process thereby resulting in an inferior finish quality. The surfaces to be painted shall be at least 5 F. above the dew point prior to and during the initial stages of the curing process. Do not apply finishes in spaces where dust is being generated during the initial stages of the coating curing process.
4. All coatings are to be applied in descending temperatures to minimize outgassing.

3.03 COATING SYSTEM –

A. Interior
1. Fill all surface voids, bug holes, cracks, minor spalled concrete, etc. with Tnemec Series 218 Mortarclad.
2. Prime all surfaces to be coated with Tnemec Series 20 Pota Pox to achieve a dry film thickness of 4.0-6.0 dry mils using a spray backroll method. Apply primer in descending temperatures.
3. Cracks Less than 1/32": Apply a 60 mil stripe coat of Tnemec Series 265 over all cracks. Allow a minimum of 4 hours to expire prior to applying the lining system to ensure there is no bond between the stripe coat and the liner.
4. Crack Greater than 1/32": Fill the routed crack to flush with existing with Tnemec Series 265. Allow a minimum of 4 hours to expire prior to applying the lining system to ensure there is no bond between the stripe coat and the liner.
5. Apply a ½" x ½" cant cove of Tnemec Series 265 at the wall to floor transition just prior to applying the lining system.
6. Apply Tnemec Series 264 Elasto-shield to achieve a film thickness of 60-80 mils.
7. Unless otherwise specified, follow all recoat windows in accordance with manufacturer's instructions.

3.04 TESTING

A. After the liner has been installed, perform holiday testing in accordance with NACE RP0 188.

3.01 TOUCH-UP AND REPAIR – At completion, all painted surfaces and coatings shall be inspected. All damaged spots, whether due to defective materials or workmanship or defects of surfaces covered shall be touched up and the finish restored. Additional coats of paint and coatings required to cover all spots or discoloration of every sort shall be applied at no additional costs to the Owner.

3.02 WORKMANSHIP AND CLEANUP – the contractor shall keep the premises clean at all times and shall remove all rubbish as often as directed by the Engineer. All debris is to be removed from the grounds.

END OF SECTION

SECTION 16050

PART 1 - BASIC ELECTRICAL MATERIALS AND METHODS

1.01 Related Work

A. Section 16060 – Grounding and Bonding
B. Section 16900 – Process Instrumentation and Control

1.02 ELECTRICAL SPECIFICATIONS: The electric supply will be 277/480 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.

1.03 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.

1.04 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.

1.05 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.

1.06 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".

1.07 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.

1.08 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.

1.09 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.

1.10 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 ¾” 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 ¾” 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.

1.11 EXCAVATION AND BACKFILLING: Excavate trenches for underground conduit or cable to required depth and width. After conduit of 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.

1.12 CLEANING: As required, clean all equipment or exposed material provided or installed under this section. Protect from any normal use of paint, mortar, etc.

1.13 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.

1.14 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.

END OF SECTION

SECTION 16060

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 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.

1.02 RELATED WORK

C. Section 16050 – Electrical Material and Methods

D. Section 16900 – Process Instrumentation and Control

1.03 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.

1.04 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

PART 2 – PRODUCTS

2.01 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 mm²] 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 mm²] and larger shall be identified per NEC.

B. Bonding conductors shall be ASTM B8 bare stranded copper, except that sizes No. 10 AWG [6 mm²] 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.

2.02 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.

2.03 CONCRETE ENCASED ELECTRODE

Concrete encased electrode shall be No. 4 AWG bare copper wire, installed per NEC.

2.04 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.

2.05 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.

2.06 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.

2.07 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.

PART 3 – EXECUTION

3.01 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.

3.02 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.

3.03 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.

3.04 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^2] bonding jumper at all intermediate metallic enclosures and across all section junctions.

2. Install insulated No. 6 AWG [16 mm²] 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 mm²] 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 mm²] 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).

3.05 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 mm²] 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.

3.06 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.

3.07 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.

3.08 LIGHTNING PROTECTION SYSTEM

Bond the lightning protection system to the electrical grounding electrode system.

3.09 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.

3.10 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.

3.11 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.

3.12 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.

D. Where rock prevents the driving of vertical ground rods, install angled ground rods or grounding electrodes in horizontal trenches to achieve the specified resistance.

END OF SECTION

SECTION 16900

PROCESS INSTRUMENTATION AND CONTROL

PART 1 – GENERAL

1.01 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.

1.02 RELATED WORK

A. Section 16050 – Electrical Material and Methods
B. Section 16060 – Grounding and Bonding

PART 2 – PRODUCTS

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.

2.02 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.

2.03 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.

2.04 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.

PART 3 – EXECUTION

3.01 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.

3.02 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.

3.03 SPARE PARTS

A. Provide the following spare parts packaged for long-term storage and delivered to the owner.

QTY.	MODEL NO.	DESCRIPTION
1	SC	Simplex Motor Controller
1	MM	Motor Monitor
1	LF	Analog Signal Line Filter

B. The System Supplier shall maintain an inventory at his facility of at least one (1) part of each type furnished on this project. These parts shall be available for delivery to the owner in a maximum of twenty-four (24) hours.

3.04 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 ensure that the pump power and control cords, as well as control floats, are protected from submergence until they are properly installed and sealed.

3.05 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 - CONTROL PANEL SPECIFICATIONS

4.01 GENERAL

A. Large double door free-standing enclosures shall be constructed of 14 gauge cold rolled steel and be equipped with a three-point latching mechanism complete with stainless steel padlocking handle and 12" floor stands welded to the enclosure. Enclosure shall be factory painted with white polyester powder paint inside and out over pretreated surfaces. The enclosure shall be rated NEMA Type 12 as indicated on drawings 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 150 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.

4.02 WATER TREATMENT PLANT CONTROL PANEL

A. SERVICE ENTRANCE: The control panel shall be designed for 277/480-volt, three-phase, four-wire power. The control panel shall be rated NEMA 12, 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. AUTOMATIC TRANSFER SWITCH: Provide a properly sized Automatic Transfer Switch (ATS), per Component Specifications and as shown on drawings, for the emergency generator equipment. The automatic transfer switch shall be installed in the control panel or be a part of the motor control center line up. The generator equipment shall come complete with a properly sized emergency main breaker.

D. SERVICE ENTRANCE SURGE PROTECTION DEVICE: Provide a service entrance rated Type 2, AC power distribution Surge Protection Device (SPD-1), 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 160kA per phase and 80kA 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, 480 volt fuses on the primary side.

F. WATER WELLS NO.4, NO.5 AND NO.6: Provide a Triplex Well Controller (TWC4-6), per Component Specifications. In the MANUAL mode the well(s) shall operate continuously. In the OFF mode the well(s) shall not operate. In the AUTOMATIC mode, the well(s) shall operate in a lead/lag/alternating fashion. The Triplex Well Controller shall receive start and stop commands from the Clearwell Level Meter/Controller and submersible transducer, as described below. The Triplex Well 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. Pump controller shall be UL Recognized for use in industrial control panels. The well controller shall perform all control functions as specified in Component Specifications Section. The well controller shall have the following indicators and controls for each well:

1. Manual-Off-Automatic selector switch
2. Green "Well Running" pilot light
3. Red "Well Failure" pilot light
4. Red "Auxiliary" pilot light

G. ANALOG CONVERSION BOARD: Provide an Analog Conversion Board (ACB-MWF), per Component Specifications, to convert a standard 4-20mA input signal to up to four (4) isolated 4-20mA output signals or up to three (3) isolated 4-20mA signals and one (1) integrator output. The unit shall provide three individual flow signals to the chemical feed system in order to pace the chemicals based on the actual plant influent flow rate.

H. AERATOR BLOWER: 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. In addition, provide the following equipment and controls.

1. Provide a Simplex Controller (SC-1), per Component Specifications. In the MANUAL mode the Aerator Blower shall operate continuously. In the OFF mode the Aerator Blower shall not operate. In the AUTOMATIC mode and after a field adjustable time delay, the Aerator Blower shall operate when any well operates. The Aerator Blower controller shall have the following indicators and controls:

    a. Manual-Off-Automatic selector switch
    b. Amber "Call" pilot light
    c. Green "Running" pilot light
    d. Red "Failure" pilot light
    e. Red "Auxiliary" pilot light

2. Provide a Motor Monitor (MM-1) complete with Current Transformer, both per Component Specifications. The motor monitor shall provide a positive run signal, monitor proper motor running conditions, 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 Aerator Blower.

I. CLEARWELL LEVEL METER/CONTROLLER: Provide a Level Meter/Controller, (LMC-CW), per Component Specifications. All control setpoints shall be field adjustable throughout the complete signal range from the front of the meter/controller. Setpoints shall be displayed on a digital readout at any time via pushbutton. The setpoints shall be field adjustable to operate on rising above or falling below the desired setpoint. The Level Meter/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 Level Meter/Controller shall receive an analog signal from the clearwell submersible pressure level transmitter, as described below in Part 5.02. The Level Meter/Controller shall provide OFF-ON set point controls for the Triplex Well Controller (TWC4-6). Provide the following set points for this controller.

1. Clearwell Full, Well(s) Stop (Rising Level)
2. Lead Well Start (Falling Level)
3. Lag Well Start (Falling Level)
4. Service Pumps Lockout Reset (Rising Level)
5. Clearwell Low Level Alarm/Service Pumps Lockout (Falling Level)
6. Provide one (1) spare setpoint for future use.

In addition, provide a signal failure relay option with two relays, to energize when the transducer signal goes above 20mA or falls below 4mA. The relays can energize on both high/low conditions or one can energize on high failure (signal above 20mA) and the other on low failure (signal loss). This failure alarm shall also energize a front panel flashing LED alarm indicator.

J. ANALOG SIGNAL LINE FILTER: Provide analog signal Line Filters (LF-MWF and LF-CW), per Component Specifications, for the clearwell level transmitter and the chemical feed system pacing. Line filter shall protect associated equipment from transient voltage surges and induced voltages.

K. CHLORINE SOLENOIDS NO.4, NO.5 AND NO.6: Provide necessary Control Relays (CR) and Timers (TM), both per Component Specifications, to activate the Chlorine Solenoid Valves, after a field adjustable time delay, when its associated well operates.

L. SODA ASH FEEDER AND SOLENOID: Provide a properly sized combination circuit breaker and definite purpose contactor, as shown on drawings, for the Feeder and solenoid. In addition, provide the following equipment and controls.

1. Provide a Simplex Controller (SC-2), per Component Specifications. In the MANUAL mode the Feeder shall operate continuously. In the OFF mode the Feeder shall not operate. In the AUTOMATIC mode and after a field adjustable time delay, the Feeder shall operate when any well operates

2. Provide an analog signal to the feeder system based on the master treatment plant influent flow rate.

M. SODA ASH MIXER: Provide a properly sized combination circuit breaker and definite purpose contactor, as shown on drawings, for the Mixer. In addition, provide the following equipment and controls.
Provide a Simplex Controller (SC-3), per Component Specifications. In the MANUAL mode the Mixer shall operate continuously. In the OFF mode the Mixer shall not operate. In the AUTOMATIC mode and after a field adjustable time delay, the Mixer shall operate when any well operates.

N. SERVICE PUMPS NO.1 AND NO.2 STARTERS AND CONTROLS: Provide a combination circuit breaker and Variable Frequency Drive starter (VFD), per Component Specifications, for each service pump and for the motor horsepower being furnished. The Variable Frequency Drive shall come complete with a 5% Line Reactor (LR), per Component Specifications, to attenuate harmonics and provide protection from transients. Acceptable VFD manufactures shall be Allen-Bradley Power Flex 753, Yaskawa P1000, or approved equal. The Full Load Amperes (FLA) of the variable frequency drive and bypass starter must be greater than the Full Load Amperes of the motor horsepower being furnished. The Contractor must use properly sized cable with ground from the starter to the motor. Motor cable ground conductor shall land on a terminal on the VFD, per VFD manufacturer's requirements. The VFD keypad shall be accessible through or installed on the deadfront door of the control panel. In addition, provide the following equipment and controls for the well.

1. The pumps shall be controlled by a Duplex Pump Controller (DPC6-7), per Component Specifications. In the MANUAL mode the service pump(s) shall operate continuously. In the OFF mode the service pump(s) shall not operate. In the AUTOMATIC mode, the service pump(s) shall operate in a lead/lag/alternating fashion. The Pump Controller shall receive start and stop commands from the Elevated Tank Level Meter/Controller and existing elevated tank pressure transmitter. The Pump 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. Pump controller shall be UL Recognized for use in industrial control panels. The triplex controller shall perform all control functions as specified in Component Specifications Section. The pump controller shall have the following operators and indicators for each pump:

    a. Manual-Off-Automatic selector switch
    b. Green "Pump Running" pilot light
    c. Red "Pump Failure" pilot light
    d. Red "Auxiliary" pilot light

2. Provide Motor Monitors (MM-6 and MM-7) complete with properly sized Current Transformer, both per Component Specifications, for each Service Pump. The Motor Monitor shall provide a positive run signal, monitor motor running current, and indicate motor running time and motor full load running amperes. In addition, the motor monitor shall come complete with high and low amperes set points for the pump.

3. Provide necessary interface to receive service pump force off and force on signals from the remote Service Pumps Local Control Station, as described below in Part 5.03.

P. PHOSPHATE FEEDER: Provide a properly sized combination circuit breaker and definite purpose contactor, as shown on drawings, for the feeder. In addition, provide the following equipment and controls.

1. Provide Simplex Controller (SC-8), per Component Specifications. In the automatic mode and after a field adjustable time delay, the feeder shall operate when any service pump operates.

R. ELEVATED TANK LEVEL METER/CONTROLLER: Provide a Level Meter/Controller, (LMC-ET), per Component Specifications. All control setpoints shall be field adjustable throughout the complete signal range from the front of the meter/controller. Setpoints shall be displayed on a digital readout at any time via pushbutton. The setpoints shall be field adjustable to operate on rising above or falling below the desired setpoint. The Level Meter/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 Level Meter/Controller shall receive an analog signal from the existing elevated tank pressure/level transmitter. The Level Meter/Controller shall provide OFF-ON set point controls for the Duplex Controller (DC6-7). Provide the following set points for this controller.

1. Tank Full/Service Pumps Stop (Rising Level)
2. Lead Pump Start (Falling Level)
3. Lag Pump Start (Falling Level)
4. Low Level Alarm (Falling Level)
5. Provide two (2) spare setpoints for future use.

In addition, provide a signal failure relay option with two relays, to energize when the transducer signal goes above 20mA or falls below 4mA. The relays can energize on both high/low conditions or one can energize on high failure (signal above 20mA) and the other on low failure (signal loss). This failure alarm shall also energize a front panel flashing LED alarm indicator.

S. DUPLEX RECEPTACLE: Provide a 120V AC, 20 amp, duplex receptacle mounted on the backplate of the controller enclosure for programming and diagnostic equipment use. Receptacle shall come complete with handy box.

T. DC POWER SUPPLY: Provide a Power Supply (DPS), per Component Specifications. The power supply shall provide 13.5V DC for the uninterruptible power supply and RTU.

U. UNINTERRUPTIBLE POWER SUPPLY: Provide an Uninterruptible Power Supply (UPS), per Component Specifications, for the radio modem transceiver. The unit shall be a 12V DC battery charger with 24V DC auxiliary power output option. The UPS shall provide 24V DC loop power for the analog instrumentation. In addition, provide one (1) 12Vdc, 12 Ah sealed, rechargeable backup battery (BAT), per Component Specifications, for the system in the event of power failure. The battery shall remain fully charged via the uninterruptible power supply.

V. REMOTE TELEMETRY UNIT: Provide a Remote Telemetry Unit (RTU), per Component Specifications. The Remote Telemetry Unit shall interface with the controls and instruments as described in this section and shall include all auxiliary modules required to interface with the existing system pressure control panel.

W. ETHERNET SWTICH: Provide an Ethernet Switch (ESW), per Component Specifications, to establish connection and communication between new treatment

plant control panel and the existing system pressure control panel fiber optic communications.

X. FIBER OPTIC PATCH PANEL: Provide a Fiber Optic Patch Panel (FOPP) to interface with the fiber optic communication network between the new treatment plant control panel and the existing system pressure control panel. FOPP shall be DIN-Space model SNAP-12SC-MM, or approved equal.

Y. DISTRIBUTION TRANSFORMER MAIN BREAKER: Provide a 70 amp, 2 pole, 480 volt circuit breaker for Distribution transformer primary side protection.

Z. DISTRIBUTION TRANSFORMER: Provide a 25kVA distribution transformer for single-phase loads. The transformer shall have 480 volt single-phase primary and 120/240-volt single-phase secondary. Transformer shall be dry-type, UL rated 185˚C system with an average maximum rise by resistance of 115˚C in a maximum ambient of 40˚C. Transformer shall be self-cooled by natural convection and shall have isolating windings.

AA. DISTRIBUTION PANEL "LP": Provide an thirty (30) circuit Lightning Panel "LP" equal to Square D Company type NQ with 100 amp, 2-pole main breaker, and number of branch breakers as shown on drawing Lighting Panel Schedule 'LP'. Lighting panel shall be mounted behind the deadfront door of the control panel enclosure, as shown on drawings. All breakers shall be accessible thru the deadfront door.

BB. CONTROL POWER SURGE PROTECTOR: Provide an in-line (series) 120 volt, 20A continuous power Surge Protection Device (SPD-2), per Component Specifications, designed to protect all of the loads fed from the control power circuit. Maximum Rated Surge Current shall be 20kA per phase with a response time less than one (1) nanosecond.

CC. ENCLOSURE EXHAUST FAN: Provide four (4) filtered steel louvers and two (2) six-inch (6") thermostatically controlled exhaust fans to properly ventilate the controller enclosure. Exhaust fans shall operate based on temperature setting or when the variable frequency drive operates. Exhaust fan shall be mounted near the top of the enclosure. In addition, provide a Thermostat (TH), per Component Specifications, to control the exhaust fans.

DD. COMMON ALARM LIGHT: Provide a weatherproof exterior Alarm Light (AL), per Component Specifications, with red Lexan lens and mounted on the side of enclosure/building where shown on plans or as directed by the project engineer. 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.

PART 5 – FIELD INSTRUMENTATION

5.01 WELL MASTER FLOWMETER: Provide a properly sized Well Master Flowmeter (WMF), per Component Specifications, to monitor the flow to the Treatment Plant. The flowmeter shall display the display the total well flow and provide an analog flow signal to the main control panel to provide pacing signals for the plant chemical feed system.

5.02 SUBMERSIBLE PRESSURE/LEVEL TRANSMITTER: Provide a Submersible Pressure/Level Transmitter (LT-CW), per Component Specifications, to monitor the treatment plant clearwell (see detail on drawings). The submersible pressure/level transmitter shall provide an analog level signal to the clearwell level/meter controller proportional to the clearwell level.

A. SUBMERSIBLE PRESSURE/LEVEL TRANSMITTER INSTALLATION: The submersible pressure/level transmitter shall be field installed by the Contractor, per project engineer's direction. Transmitter shall be suspended six-inches (6") above the bottom of the wetwell.

B. JUNCTION BOX AND ANALOG SIGNAL LINE FILTER: Provide and install a properly sized NEMA 4 rated junction box, suited for outdoor/wet locations, complete with an analog signal Line Filter (LF), per Component Specifications, for the wetwell pressure/level transmitter. Junction shall have a 1/8" drain/breather hole installed in the bottom of the enclosure. Line filter shall protect associated equipment from transient voltage surges and induced voltages. Junction box shall be field installed by the Contractor in close proximity of the submersible pressure level transmitter. The Contractor shall be responsible for properly sealing the conduits entering the junction box.

5.03 SERVICE PUMPS LOCAL CONTROL STATION: Provide a local control station to be installed at a location determined by the Owner and project Engineer. The local control station shall interface with the service pumps controller to allow the operator the ability to manually control the service pumps in order to backwash the filters. The local control station shall be rated NEMA 3R and provide manual-off-automatic selector switches and "running" indication pilot lights for required quantity of service pumps at the treatment plant. Selector switches shall be C3 model W22S2-HW and pilot lights shall be C3 model W22UNR-120LW-WNLG.

5.04 COMPATIBILITY: All equipment and controls shall be compatible with the existing Clara Water Association Pressure/Control system as furnished by Control Systems, Inc. of Jackson, MS, 601-355-8594.

5.05 RESPONSIBILITY: The Contractor shall be responsible for coordinating all work covered in this section with the City, Contractor and Engineer. All work shall be performed based on the standards of the National Electric Code (NEC) currently in force by the Authority Having Jurisdiction (AHJ).

5.06 MODIFICATIONS TO THE EXISTIING SUPERVISORY, CONTROL, and DATA AQUASITION SYSTEM: All data gathered from new equipment installed under this contract shall be incorporated into the existing Clara Water Association Pressure/Control system to provide the operator with graphical interface and monitoring. The control system supplier shall be responsible for coordinating all work with the Association, Contractor and Engineer.

Currently all three wells can be controlled based on elevated tank level or system pressure as manually selected by the Operator. Under this contract, the control scenario shall be modified to allow only the service pumps to be controlled based on elevated tank level or system pressure as manually selected by the Operator.

5.07 CONDUITS: All conduits entering control panels shall be properly sealed, per plans, to ensure corrosive gasses, and water/moisture does not enter into panel. It is the responsibility of the Contractor to provide and install adequate conduit seals. It is recommended that re-enterable sealant compounds are used; equal to 3M Scotchcast 2112C or Alesko Epoxy Sealing Putty.

5.08 GROUNDING: All control panels shall be properly grounded per Section 16060 – Grounding and Bonding for Electrical Systems. The Contractor shall provide certified test reports of ground resistance.

A. Certification that the materials and installation are in accordance with the drawings and specifications.
B. Certification by the Contractor that the complete installation has been properly installed and tested.

PART 6 – COMPONENT SPECIFICATIONS

6.01 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 3rd Edition
4. UL 1283 Listed
5. NEMA LS1 Compliance

D. Operating Voltage: 277/480 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 (where applicable); all phases – phase to phase; and neutral to ground.

H. Rated Single Pulse Surge Current Capacity: at rated voltage, no less than:

160,000 A Line to Line
80,000 A Line to Neutral
80,000 A Line to Ground
80,000 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 UL1449 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 SSMA16-3Y2.

TAG	SERVICE
SPD-1	Service Entrance Surge Protection Device

6.02 AUTOMATIC TRANSFER SWITCH: Automatic Transfer Switch shall be provided with number of poles, amperage, voltage, withstand, and close-on ratings as shown on the plans. Automatic transfer shall consist of an inherently double throw power transfer switch mechanism and a microprocessor controller to provide automatic operation. All transfer switches and controllers shall be the products of the same manufacturer.

A. Codes and Standards: The automatic transfer switches and controls shall conform to the requirements of:

1. UL 1008 – Standard for Transfer Switch Equipment
2. NFPA 70 – National Electrical Code
3. NFPA 110 – Emergency and Standby Power Systems
4. IEEE Standard 446 – IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
5. NEMA Standard ICS10-1993 (formerly ICS2-447) – AC Automatic Transfer Switches
6. NEC Articles 700, 701, 702
7. International Standards Organization ISO 9001

B. Acceptable Manufacturers: Automatic transfer switches shall be ASCO 300 Series. Any alternate shall be submitted for approval to the consulting engineer at least ten (10) days prior to bid. Alternate bids must list any deviations from this specification.

C. PRODUCTS

1. Mechanically Held Transfer Switch

a. The transfer switch shall be electrically operated and mechanically held. The electrical operator shall be a single-solenoid mechanism, momentarily energized. Main operators which include over current disconnect devices shall not be acceptable. The switch shall be mechanically interlocked to ensure only two possible positions, normal or emergency.

b. The switch shall be positively locked and unaffected by momentary outages, so that contact pressure is maintained at a constant value and contact temperature rise is minimized for maximum reliability and operating life.

c. All main contacts shall be silver composition. Switches rated 600 amperes and above shall have segmented blow-on construction for high withstand current capability and be protected by separate arcing contacts.

d. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. A manual operating handle shall be provided for maintenance purposes. The handle shall permit the operator to manually stop the contacts at any point throughout their entire travel to inspect and service the contacts when required.

e. Designs utilizing components of molded-case circuit breakers, contactors, or parts thereof, which are not intended for continuous duty, repetitive switching or transfer between two active power sources, are not acceptable.

f. Where neutral conductors must be switched, the ATS shall be provided with fully rated neutral transfer contacts.

g. Where neutral conductors are to be solidly connected as shown on the plans, a neutral conductor plate with fully rated AL-CU pressure connectors shall be provided.

2. Microprocessor Controller

a. The controller shall direct the operation of the transfer switch. The controller's sensing and logic shall be controlled by a built-in microprocessor for maximum reliability, minimum maintenance, and inherent serial communications capability. The controller shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the controller to be disconnected from the transfer switch for routine maintenance.

b. The controller shall be enclosed with a protective cover and be mounted separate from the transfer switch unit for safety and ease of maintenance. Sensing and control logic shall be provided on printed circuit boards. Interfacing relays shall be industrial grade plug-in type with dust covers.

c. The controller shall meet or exceed the requirements for Electromagnetic Compatibility (EMC) as follows:

1. ANSI C37.90A/IEEE 472 Voltage Surge Test
2. NEMA ICS – 109.21 Impulse Withstand Test
3. IEC801-2 Electrostatic discharge (ESD) immunity
4. ENV50140 and IEC 801 – 3 Radiated electromagnetic field immunity
5. IEC 801 – 4 Electrical fast transient (EFT) immunity
6. ENV50142 Surge transient immunity
7. ENV50141: Conducted radio-frequency field immunity
8. EN55011: Group 1, Class A conducted and radiated emissions
9. EN61000 – 4-11 Voltage dips and interruptions immunity

D. OPERATION

1. Voltage and Frequency Sensing

a. The voltage of each phase of the normal source shall be monitored, with pickup adjustable to 95% of nominal and dropout adjustable from 70% to 90% of pickup setting.

b. Single-phase voltage and frequency sensing of the emergency source shall be provided.

2. Time Delays

a. An adjustable time delay shall be provided to override momentary normal source outages and delay all transfer and engine starting signals.

b. An adjustable time delay shall be provided on transfer to emergency, adjustable from 0 to 5 minutes for controlled timing of transfer of loads to emergency.

c. A generator stabilization time delay shall be provided after transfer to emergency.

d. An adjustable time delay shall be provided on retransfer to normal, adjustable to thirty (30) minutes. Time delay shall be automatically bypassed if emergency source fails and normal source is acceptable.

e. A five (5) minute cool down time delay shall be provided on shutdown of engine generator.

f. All adjustable time delays shall be field adjustable without the use of special tools.

3. Additional Features

a. A set of contacts rated 5 amps, 32 VDC shall be provided for a low-voltage engine start signal. The start signal shall prevent dry cranking of the engine by requiring the generator set to reach proper output, and run for the duration of the cool down setting, regardless of whether the normal source restores before the load is transferred.

b. A push-button type test switch shall be provided to simulate a normal source failure.

c. A push-button type switch to bypass the time delay on transfer to emergency, the engine exerciser period on the retransfer to normal time delay whichever delay is active at the time the push-button is activated.

d. Terminals shall be provided for a remote contact which opens to signal the ATS to transfer to emergency and for remote contacts which open to inhibit transfer to emergency and/or retransfer to normal.

e. Auxiliary contacts, rated 10 amps, 250 VAC shall be provided consisting of one contact, closed when the ATS is connected to the normal source and one contact closed, when the ATS is connected to the emergency source.

f. Indicating lights shall be provided; one to indicate when the ATS is connected to the normal source (green) and one to indicate when the ATS is connected to the emergency source (red). Also, provide indicating lights for both normal and emergency source availability.

g. Terminals shall be provided to indicate actual availability of the normal and emergency sources, as determined by the voltage sensing pickup

and dropout settings for each source.

h. Engine Exerciser: An engine generator exercising timer shall be provided, including a selector switch to select exercise with or without load transfer.

i. Inphase Monitor: An Inphase monitor shall be inherently built into the controls. The monitor shall control transfer so that motor load inrush currents do not exceed normal starting currents, and shall not require external control of power sources. The inphase monitor shall be specifically designed for and be the product of the ATS manufacturer.

j. Selective Load Disconnect: A double throw contact shall be provided to operate after a time delay, adjustable to 20 seconds prior to transfer and reset 0 to 20 seconds after transfer. The contact can be used to selectively disconnect specified load(s) when the transfer switch is transferred. Output contacts shall be rated 6 amps at 28 VDC or 120 VAC.

E. ADDITIONAL REQUIREMENTS

1. Withstand and Closing Ratings (WCR): The ATS shall be rated to close on and withstand the available RMS symmetrical short circuit current at the ATS terminals with the type of over current protection shown on the plans. WCR ATS ratings shall be as shown below in Table 1 when used with specific circuit breakers:

Table 1: WCR ATS ratings

ATS Size	Withstand & Closing Rating MCCB	W/CLF
30	22,000A	100,000
70 – 200	22,000A	200,000
230	22,000A	100,000
260 – 400	42,000A	200,000
600 – 1200	65,000A	200,000
1600 – 2000	85,000A	200,000
2600 – 3000	100,000A	200,000

2. Tests and Certification

a. The complete ATS shall be factory tested to ensure proper operation of the individual components and correct overall sequence of operation and to ensure that the operating transfer time, voltage, frequency and time delay settings are in compliance with the specification requirements.

b. Upon request, the manufacturer shall provide a notarized letter certifying compliance with all of the requirements of this specification including compliance with the above codes and standards, and withstand and closing ratings. The certification shall identify, by serial

number(s), the equipment involved. No exceptions to the specifications, other than those stipulated at the time of the submittal, shall be included in the certification.

c. The ATS manufacturer shall be certified to ISO 9001: 2000 International Quality Standard and the manufacturer shall have third party certification verifying quality assurance in design/development, production, installation, and servicing in accordance with ISO 9001: 2000.

3. Service Representation

a. ATS manufacturer shall maintain a national service organization of company-employed personnel located throughout the contiguous United States. The service center's personnel must be factory trained and must be on call twenty-four (24) hours a day, 365 days a year.

b. The manufacturer shall maintain records of each switch, by serial number, for a minimum of twenty (20) years.

c. For ease of maintenance, the transfer switch nameplate shall include drawing numbers and serviceable part numbers.

TAG	SERVICE
ATS	Normal and Emergency Power Transfer Switch

6.03 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: -40ºC to +50ºC, -38ºF to +122ºF
I. Storage Temp: -45ºC to +85ºC, -47ºF to +185ºF
J. Enclosure: Lexan, surface mount
K. UL and cUL listed

TAG	SERVICE
PM	Electrical System Power Monitor

6.04 TRIPLEX WELL CONTROLLER: Provide a Triplex Well Controller, including the following features for each well:

A. OPERATORS AND INDICATORS

1. Manual-Off-Automatic selector switch
2. Green "Running" pilot light
3. Red "Failure" pilot light
4. Green well "Start" pilot lights for Lead, Lag 1, and Lag 2.
5. Amber well "Stop" pilot lights for Lead, Lag 1, and Lag 2.

B. LEVEL INPUTS

1. Individual "Start" and "Stop" level control points shall be provided for each well or field adjustable controls shall be provided to allow the first "Stop" level control point to stop all of the wells.
2. Provide a Low liquid level alarm input sensing point, as required for the application.
3. Provide pilot light indicators for each level input sensing point.
4. Provide manual override inputs for each well, which can be used to override the triplex controller=s well call-for outputs when the controls are in the Automatic mode. Inputs shall be provided to start or stop each well from a remote location.
5. All well control inputs shall be optically isolated and their power limited to 24V DC with a maximum current of 16mA DC for intrinsic safety.

C. WELL SEQUENCING

1. Automatic well alternation on each lead well "Call" cycle. Well alternation shall be field selectable to alternate on a first well "On", first well "Off" basis or on a last well "On", first well "Off" basis.
2. The wells shall also alternate as lead well, when the lead well reaches a field adjustable running time, which shall have a time range from 10 minutes to 21 hours.
3. Provide a field adjustable failure time delay for each well. If a well fails to run, or if that well's selector switch is placed in the off position, provide controls to start the next well in the sequence at the failed or disabled well=s operating call-for input setting.
4. If a well fails to run, that well shall automatically become the last called for well in the operating sequence. Normal well alternation shall resume when the failure condition is corrected and the failed well has been reset.

5. Provide individual field adjustable time controls to delay starting each well in the automatic mode after power failure or during initial start up.
6. Provide stagger stop feature to require the wells to stop a minimum of two (2) seconds apart during the condition that two or more wells are running when signaled to stop. Provide stagger start feature to start the wells a minimum of three (3) seconds apart during conditions that two are more wells are called for simultaneously.
7. Provide controls to remove any well(s) from the alternating sequence, making the removed well(s) the last well(s) to be called for if the input conditions require it.
8. Well failure, Low-level alarm, and Improper Sequence alarm red pilot lights shall flash when activated.
9. Provide automatic controls to alternate on Well Failure or when a well is running in Automatic and is manually turned off.

D. INPUT MONITORING AND CONTROL

1. The Manual-Off-Automatic switches shall bypass all of the controls and energize their respective well outputs when placed in the Manual position. In the Manual and OFF modes, well failure alarms shall be disabled.
2. The Manual-Off-Automatic switches shall be used to reset a well failure alarm after the failure condition has been cleared, by manually switching the failed well to the OFF position and back to Automatic.
3. Provide automatic input sequence monitoring, such that if the first "All Wells Stop" input fails to activate, and any two start inputs are activated, the lead well shall start.
4. If a third start input is activated, start the first lag well.
5. If the low-level alarm input is activated, start all wells.
6. When operating in a "Last On, First Off" mode, each well that is started is turned off at the next lower start input setting during the Aimproper sequence". That is, the Lag 2 well will turn off at the Lag 1 Start setting, Lag 1 will turn off at the Lead Start setting and the Lead well will run until the Lead Start input turns off.
7. When operating in a AFirst On, First Off@ mode, the Lead well will turn off first, followed by the Lag 1, and Lag 2 wells.
8. Provide a red pilot light indicator to alarm "Improper Input Sequence" when any of the above-described conditions occurs. In addition, provide a manual reset pushbutton switch for clearing the Improper Sequence alarm.
9. If the "improper sequence" clears itself, the wells will return to normal operation. The alarm will continue to be energized until manually reset.

E. ANNUNCIATING

1. Provide individual discrete well running output contacts for each well.
2. Provide individual discrete "Alarm Telemetry" dry contact outputs for the following alarms:

    a. Each well failure
    b. Low level alarm
    c. Improper level input Sequence
    d. Provide a Common Alarm discrete output contact that will actuate

when any alarm condition occurs.

3. Provide an exterior alarm light output, which allows the light to dim glow under normal conditions to indicate power on, and lamp good. The light shall flash brightly during any alarm condition.

TAG	SERVICE
TWC1-3	Triplex Well Controller

6.05 MOTOR MONITOR: Provide an electronic solid state Motor Monitor 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.

TAG	SERVICE
MM-1	Aerator Blower Motor Monitor
MM-6	Service Pump No.1 Motor Monitor
MM-7	Service Pump No.2 Motor Monitor

6.06 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.

TAG	SERVICE
CT	Current Transformer (qty. of 3)

6.07 VARIABLE FREQUENCY DRIVE: Variable Frequency Drives shall conform to the

following specifications:

A. General Requirements

1. The VFD shall convert the input AC main power to an adjustable frequency and voltage as defined in the following sections.
2. The VFD shall be listed and labeled as a complete unit and shall include all accessories and requirements as described in this section.

B. Certifications

1. Listed to UL508C and CAN/CSA-C22.2 No. 14-05
2. In conformity with EMC Directive (2004/108/EC) and Low Voltage Directive (2006/95/EC). Standards applied; EN 61800-3:2004, EN 61800-5-1:2007
3. TÜV Rheinland - standards applied: EN 61800-3:2004, EN 61800-5-1:2007, EN ISO 13849-1:2008, EN ISO 13849-2:2003, EN 61800-5-2:2007, EN 61508 PARTS 1-7:2000, EN 62061:2005, and EN 60204-1:2006
4. Electric Power Research Institute. Certified compliant with standards SEMI F47 and IEC 61000-4-34

C. Hardware

1. Utilize Diode Bridge or SCR Bridge on the input rectifier.
2. Utilize DC bus inductor on all six-pulse VFDs only.
3. Utilize switching logic power supply operating from the DC bus.
4. Incorporate phase to phase and phase to ground MOV protection on the AC input line.
5. Microprocessor based inverter logic shall be isolated from power circuits.
6. Utilize latest generation IGBT inverter section.
7. Battery receptacle for Lithium battery power to the Real Time Clock.
8. Additional DPI port for handheld and remote HIM options.
9. Dedicated Digital Input for hardware enable.
10. Conformal coated printed circuit boards.
11. Optional onboard 24V DC Auxiliary Control Power Supply.

D. Control Logic

1. Ability to operate with motor disconnected.
2. Provide a controlled shut down, when properly protected, with no component failure in the event of an output phase to phase or phase to ground short circuit. Provide annunciation of the fault condition.
3. Provide multiple programmable stop modes including Ramp, Coast, DC-Brake, Ramp-to Hold, Fast Braking, and Current Limit Stop.
4. Provide multiple acceleration and deceleration rates.
5. Adjustable output frequency up to 650Hz.

E. Motor Control Modes

1. Selectable Sensorless Vector, Flux Vector, V/Hz, and Adjustable Voltage
2. Control modes selectable through programming.
3. The drive shall be supplied with a Start-up and Auto-tune mode.

4. The V/Hz mode shall be programmable for fan curve or full custom patterns.
5. Capable of Open Loop V/Hz.

F. Current Limit

1. Programmable current limit from 20 to 160% of rated output current.
2. Current limit shall be active for all drive states: accelerating, constant speed and decelerating.
3. The drive shall employ PI regulation with an adjustable gain for smooth transition in and out of current limit.

G. Acceleration / Deceleration

1. Accel/Decel settings shall provide separate adjustments to allow either setting to be adjusted from 0 to 3600 seconds.
2. A second set of remotely selectable accel/decel settings shall be accessible through digital inputs.

H. Speed Profiles

1. Programming capability shall allow the user to produce speed profiles with linear acceleration/deceleration or "S Curve" profiles that provide changing accel/decel rates.
2. S Curve profiles shall be adjustable.

I. Adjustments

1. A digital interface can be used for all set-up, operation and adjustment settings.
2. All adjustments shall be stored in nonvolatile memory (EEPROM).
3. EEPROM memory for factory default values shall be provided.

J. Process PID Control

1. The drive shall incorporate an internal process PI regulator with proportional and integral gain adjustments as well as error inversion and output clamping functions.
2. The feedback shall be configurable for normal or square root functions. If the feedback indicates that the process is moving away from the set-point, the regulator shall adjust the drive output until the feedback equals the reference.
3. Process control shall be capable of being enabled or disabled with a hardwire input. Transitioning in and out of process control shall be capable of being tuned for faster response by preloading the integrator.
4. Protection shall be provided for a loss of feedback or reference signal.

K. Skip Frequencies

1. Three adjustable set points that lock out continuous operation at frequencies which may produce mechanical resonance shall be provided.
2. The set points shall have a bandwidth adjustable from Maximum Reverse
3. Speed to Maximum Forward Speed.

L. Fault Reset / Run

1. The drive shall provide up to nine automatic fault reset and restarts following a fault condition before locking out and requiring manual restart.
2. The automatic mode shall not be applicable to a ground fault, shorted output faults and other internal microprocessor faults.
3. The time between restarts shall be adjustable from 0.5 seconds to 30 seconds.

M. Run on Power Up

A user programmable restart function shall be provided to allow restart of the equipment after restoration of power after long duration power outages. Restart time dependent on presence of incoming signal.

N. Fault Memory

1. The last 32 fault codes shall be stored and time stamped in a fault buffer.
2. Information about the drive's condition at the time of the last fault such as operating frequency, output current, dc bus voltage and twenty-seven other status conditions shall be stored.
3. A power-up marker shall be provided at each power-up time to aid in analyzing fault data.
4. The last 32 alarm codes shall be stored and time stamped for additional troubleshooting reference.

O. Overload Protection

1. The drive shall provide internal class 10 adjustable overload protection.
2. Overload protection shall be speed sensitive and adjustable.
3. A viewable parameter shall store the overload usage.

P. Auto Economizer

1. An auto economizer feature shall be available to automatically reduce the output voltage when the drive is operating in an idle mode (drive output current less than programmed motor FLA). The voltage shall be reduced to minimize flux current in a lightly loaded motor thus reducing kW usage.
2. When the load increases, the drive shall automatically return to normal operation.

Q. Terminal Blocks

1. Separate terminal blocks shall be provided for control and power wiring.
2. I/O terminal blocks shall be removable with wiring in place.

R. Flying Start

The drive shall be capable of determining the speed and direction of a spinning motor and adjust its output to "pick-up" the motor at the rotating speed. This feature is disabled by default.

S. Inputs and Outputs

1. The Input / Output option modules shall consist of both analog and digital I/O.
2. No jumpers or switches shall be required to configure digital inputs and outputs.
3. All digital input and output functions shall be fully programmable.
4. The control terminal blocks shall be rated for 115V AC.
5. Inputs shall be optically isolated from the drive control logic.
6. The control interface card shall provide input terminals for access to fixed drive functions that include start, stop, external fault, speed, and enable.
7. The VFD shall be capable of supporting up to 7 analog inputs, 7 analog outputs, 21 digital inputs, 7 relay outputs, 7 transistor outputs, and 3 positive temperature coefficient (PTC) inputs.
8. The Input / Output option modules shall have the following features:

    a) Analog Inputs:

        i. Quantity two (2) differentially isolated, ±10V (bi-polar), 88k ohm input impedance, 11 bit plus sign.
        ii. Analog inputs shall be user programmable for a variety of uses including frequency command and process loop input. Analog inputs shall be user programmable for function scaling (including invert), offset, signal loss detect and square root.

    b) Analog Outputs:

        i. Quantity two (2) ±10V (bi-polar) / 11 bit & sign, 2 kΩ minimum load, 4-20 mA, 11 bit plus sign, 400 Ω maximum load.
        ii. The analog output shall be user programmable to be proportional to one of fourteen process parameters including output frequency, output current, encoder feedback, output power.
        iii. Programming shall be available to select either absolute or signed values of these parameters.

    c) Digital Inputs:

        i. Quantity of six (6) digital inputs rated 24V DC/115V AC.
        ii. All inputs shall be individually programmable for multiple functions including: Start, Run, Stop, Auxiliary Fault, Speed Select, Jog and Process PI functions.

    d) Digital Outputs:

        i. At least one (1) relay output (N.O. or N.C.).
        ii. For 240V AC or 24V DC, N.O. contact output ratings shall be 2 amp max., general purpose (inductive)/resistive. N.C. contact output ratings shall be 2 amp max., resistive only.
        iii. Relays shall be programmable to multiple conditions including: Fault, Alarm, At Speed, Drive Ready and PI Excess Error.

iv. Timers shall be available for each output to control the amount of time, after the occurring event, that the output relay actually changes state.
v. At least one (1) transistor output.
vi. For 24V DC, transistor output rating shall be 1 amp max, Resistive.

T. Reference Signals

1. The drive shall be capable of using the following input reference signals:

a) Analog inputs
b) Preset speeds
c) Remote potentiometer
d) Digital MOP
e) Human Interface Module
f) Communication modules

U. Loss of Reference

1. The drive shall be capable of sensing reference loss conditions.
2. In the event of loss of the reference signal, the drive shall be user programmable to the following:

a) Fault the drive and coast to stop.
b) Issue a minor fault - allows the drive to continue running while some types of faults are present.
c) Alarm and maintain last reference.

3. When using a communications network to control the drive, the communications adapter shall have these configurable responses to network disruptions and controller idle (fault or program) conditions:

a) Fault
b) Stop
c) Zero Data
d) Hold Last State
e) Send Fault Configuration

V. Metering

1. At a minimum, the following parameters shall be accessible through the Human Interface Module, if installed:

a) Output Current in Amps
b) Output Voltage in Volts
c) Output Power in kW
d) Elapsed MWh
e) DC Bus Voltage
f) Frequency
g) Heatsink Temperature

h) Last eight (32) faults
i) Elapsed Run Time
j) IGBT Temperature

W. Faults

1. At a minimum, the following faults shall be accessible through the Human Interface Module:

a) Power Loss
b) Undervoltage
c) Overvoltage
d) Motor Overload
e) Heat Sink Over-temperature
f) Maximum Retries
g) Phase to Phase and Phase to Ground Faults

X. Predictive Diagnostics

1. At a minimum, the following predictive diagnostic features shall be provided:

a) Relay Output Life Cycles based on load type and amps.
b) Hours of Fan Life based on load and ambient temperature.
c) Motor Bearing life based on expected hours of use.
d) Motor Lubrication schedule based on hours of use.
e) Machine Bearing life based on expected hours of use.

Y. Real-Time Clock

1. Shall be capable of providing time stamped events.
2. Shall have the ability to be set locally or via a remote controller.
3. Shall provide the ability to be programmable for month, day, year and local time zones in HH:MM:SS.

Z. Installation: Installation shall be in compliance with manufacturer's instructions, drawings and recommendations.

AA. Start-up

1. Certified factory start-up shall be provided for each VFD provided.
2. Service engineers shall be employed by the manufacturer or be certified by the manufacturer and provide start-up services including physical inspection of drive and connected wiring and final adjustments to meet specified performance requirements.

BB. Product Support

1. Factory trained application engineering and service personnel that are familiar with the VFD products offered shall be locally available.
2. A 24 hour, 365 day technical support line shall be available.

CC. Manufacturers

1. Allen-Bradley – PowerFlex 753 VFD.
2. Substitutions must be submitted in writing three (3) weeks prior to original bid date with supporting documentation demonstrating that the alternative manufacturer meets all aspects of the specification herein.

DD. Warranty: The manufacturer shall provide their standard parts warranty for eighteen (18) months from the date of shipment or twelve (12) months from the date of being energized, whichever occurs first. Warranty shall be twenty-four (24) months from the date of certified start-up, not to exceed thirty (30) months from the date of shipment.

TAG	SERVICE
VFD-1	Service Pump No.1 Variable Frequency Drive
VFD-2	Service Pump No.2 Variable Frequency Drive

6.08 LINE REACTOR: Provide a Line Reactor for each Variable Frequency Drive being furnished. The Reactor shall be properly rated for the motor amperes required. The Reactor shall have a 5% filter rating to alternate harmonics and provide protection from transients. Line reactor(s) shall have the following features.

A. Standard impedance values by calculation: 1.5%, 2%, 3%, 4%, 5% available
B. Impedance Basis: Reactor rated current, line voltage, frequency and inductance
C. Service Factor: Reactors rated 1 to 750 Amps - 150% of rating; Reactors rated above 750 Amps - 125% of rated minimum.
D. Overload Rating: 200% of rated for 30 minutes; 300% of rated for 1 minute
E. Maximum System Voltage: 600 Volts (units with terminal blocks); 690 Volts (units with box lugs or tab terminals)
F. Maximum Switching Frequency: 20 kHz
G. Insulation System: Class N (200°C *392°F*)
H. Temperature Rise (o*pen or enclosed reactors*): 135°C *275°F* (maximum)
I. Ambient Temperature (o*pen or enclosed reactors*): 45°C *113*°F (Full rated)
J. Altitude (*maximum*): 1000 meters
K. Fundamental Frequency *(Line or Load*): 50/60 Hz
L. Approvals: CE, UL-508, CSA C22.2
M. Inductance Curve *(typical)*: 100% at 100% current; 100% at 150% current; 50% at 350% current (minimum)
N. Inductance Tolerance: +/- 10%
O. Impregnation: High Bond Strength "Solvent-Less" Epoxy, 200° C; UL94HB recognized
P. Dielectric Strength: 3000 volts RMS (4243 volts peak)
Q. dV/dT Protection: Meets NEMA MG-1, part 31 (same as inverter duty motors)
R. Agency Approvals: UL-508 File E180243 Component Listed (1 amp – 2400 amps); UL-508 File E180243 UL Listed NEMA 1 units (1 amp – 2400 amps)
Note: Short Circuit rating not required under Exception No.1 of UL508A SB4.2.1 effective 4/25/06; CSA C22.2 File LR29753-13 CSA Certified (1 amp – 2400 amps); Class N, 200° C File E66214, Type 200-18, UL Recognized Insulation System; CE Marked
S. Material: Core Steel: Electrical grade high frequency silicon steel; Windings: High dielectric withstand solid copper conductor (220° C); Enclosures: Sheet steel per UL

and CSA requirements. Painted ANSI-61 Grey; Brackets: ASTM structural steel or structural aluminum; Sheet Insulation: DuPont Nomex 410 (220° C); Epoxy: Ripley Resin Type 468-2 (220° C)

T. Construction: CORE: Electrical grade silicon steel magnetic laminations; Windings: 3000 volts RMS dielectric strength (coil-to-coil & coil-to-core);

U. Assembly: Windings are assembled onto EI laminations, secured in place & epoxy impregnated for minimum noise & maximum structural rigidity.

V. Testing: Inductance, Hi-Pot 3000 Volts RMS (5656 volts peak)

TAG	SERVICE
LR	Variable Frequency Drive Line Reactor (qty. of 2)

6.09 SIMPLEX MOTOR CONTROLLER: Provide a Simplex Motor Controller including the following features.

A. Manual-Off-Automatic selector switch, green "Motor Running" pilot light, red "Motor Failure" pilot light, red "High Level or Auxiliary" pilot light and a red "Seal Failure or Auxiliary" pilot light.

B. Motor 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 a field adjustable time delay to start the motor after motor "Call For" signal is received. This time delay shall be field adjustable to occur each time the motor is called to operate for backspin protection. The timing period shall be adjustable from 13 to 165 seconds.

D. 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 motor failure, motor seal failure/auxiliary or high-level/auxiliary conditions.

E. Provide a motor failure dry-contact output and flashing alarm indicator. The failure controls shall energize the dry-contact output, flash the motor failure alarm indicator and energize the common alarm circuitry if the motor fails to run when called for while in the Automatic mode of operation.

F. The Manual-Off-Automatic switch shall bypass all of the controls and energize the motor call-for dry-contact output when placed in the Manual position. In the Manual and Off positions the motor failure alarm shall be disabled.

G. The Manual-Off-Automatic switch shall be used to reset a motor failure alarm after the failure condition has been cleared, by manually switching the motor to the Off position and back to Automatic.

H. Provide a motor seal failure/auxiliary alarm and indicator that shall flash the indicator and common alarm light output and close the seal failure dry-contact output and common alarm dry-contact output during a seal failure/auxiliary condition. The seal failure/auxiliary controls shall have a 3 to 9 second field adjustable time delay before activation. The seal failure/auxiliary alarm shall automatically reset when the condition clears.

I. Provide an input alarm to indicate high-level/auxiliary condition. Provide a red panel indicator and dry-contact output for the alarm. On alarm, flash the indicator, close the alarm dry-contact output and energize the Common Alarm circuitry.

J. Provide a field adjustable time delay to prevent motor failure signal from being activated until the controller has had time to receive a motor "Running" signal. The timing range shall be adjustable from 5 seconds to 5.25 minutes. During motor failure conditions, provide the following controls.

1. Red "Motor 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 "Motor Failure" condition.

K. The Simplex Motor Controller shall be solid state and easily replaceable. Conventional relay and/or timer construction is not acceptable.

TAG	SERVICE
SC-1	Aerator Controller
SC-2	Lime Feeder Controller
SC-3	Lime Mixer Controller
SC-4	KMNO4 Feeder Controller
SC-5	KMNO4 Mixer Controller
SC-6	Phosphate Feeder Controller

6.10 LEVEL METER/CONTROLLER: Provide an electronic, solid-state, proportional Level Meter/Controller that will accept a four (4) to twenty (20) mA or a one (1) to five (5) volt DC signal. In addition, 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 Level Meter/Controller shall have the following features.

A. Provided with a 3.5 digit LED (or LCD if required) readout meter in feet of water. The display shall be capable of being calibrated from the front of the unit and have a maximum display of 1999, with a decimal point that is user selectable.

B. The display zero indication shall be able to be offset anywhere within the range of the meter, with a minimum range of 60 counts.

C. Provide six (6) or twelve (12) separate setpoints each with discrete, isolated sealed SPDT relay output contacts.

D. Provide excitation voltage to drive a transducer/transmitter and condition its output signal to provide a continuous display of level.

E. The setpoints shall be field adjustable to operate on rising above or falling below the setpoint.

F. An LED indicator shall be provided for each setpoint to indicate when it is activated.

G. The actual setting of each setpoint shall be able to be displayed on the digital readout at any time.

H. The setting of each setpoint shall be adjustable throughout the complete signal range from the front of the meter/controller.

I. Provide a means of manually ramping the meter/controller, up and down, throughout its complete signal range, to test the operation of the setpoints.

J. The meter/controller shall come complete with a four (4) to twenty (20) mA, or a one (1) to five (5) volt DC output signal for additional monitoring and control devices.

K. Provide a signal failure relay option with two relays, to energize when the input signal goes above 20 mA or below 4 mA. The relays can energize on both high/low conditions or one can energize on high failure and the other on low failure. In addition, either relay may be set to 'flash' on and off during the failure condition. This failure alarm shall also energize a front panel flashing LED alarm indicator.

L. Provide a Lamp Test feature to test the digital display and individual LED setpoint indicators.

TAG	SERVICE	SCALE
LMC-CW	Clearwell Level Controller	0-35 feet

6.11 TELEMETRY LINE FILTER: Provide a telemetry line filter with a fast-acting design to protect data and communications equipment from transient voltage surges and induced voltages. The filter shall be a low-impedance, two-stage hybrid design with a first stage consisting of a heavy-duty energy handling gas discharge tube having a breakdown voltage rating between 200 and 350 volts. Impulse breakdown at 100 volts per microsecond shall equal 600 volts. A filter capacitor shall be connected across the lines, rated a 1kv. The second stage shall consist of two current limiting resistors, a fast-acting solid-state transient voltage surge absorber from each line to ground to protect each line up to a maximum continuous voltage of 30V AC or 38V DC with a 50 nanosecond response time. In addition, a separate bi-directional transient voltage surge absorber rated at 1500W @ 33V DC, which is connected across the two lines, for maximum protection. Integral wiring terminal blocks shall be included for both line and equipment sides of the filter. The filter shall be mountable directly on the panel backplate or be able to use track mounting if required.

TAG	SERVICE
LF	Analog Signal Line Filter (qty. of 5)

6.12 SUBMERSIBLE PRESSURE/LEVEL TRANSMITTER: Provide a solid-state direct submersible level sensor and transducer designed as pressure sensor for continuous, hydrostatic level measurement in open containers/basins. Transmitter shall have a high resistance to overload and aggressive media with a ceramic diaphragm and enclosed in 316L stainless steel housing. The range of the transmitter shall be as required for the desired application with excitation voltage of 10 - 35V DC. Instrument cable shall be commercially available shielded instrument cable with a minimum of forty-five foot (45') cable length. The transmitter shall be capable of being supported by its own cable. The electronics shall be completely potted and provide a 4 – 20mA analog output to the level meter/controller. The accuracy shall be ±0.2% full scale. The transmitter shall be mounted near the bottom of the vessel with support bracket and be cable connected. Transmitter shall have Drinking water approvals: KTW, NSF, and ACS; and approvals by: ATEX, FM, and CSA.

A. Application: Type of pressure: Relative Pressure, Liquids

B.	Operating Voltage:	10-30 V DC
C.	Electrical Design:	DC
D.	Output Function:	4-20 mA analog
E.	Measuring Range:	0 – 0.6 bar (0 – 8.70 psi)
F.	Pressure Rating:	4 bar (58 psi)
G.	Bursting Pressure Min.:	4.8 bar (69.62 psi)
H.	Characteristics Deviation:	< 0.25 (BFSL) / 0.5 *
I.	Connection:	PUR cable / 15 m
J.	Housing Materials:	Stainless Steel 316Ti / 1.4571; PA
K.	Medium Temperature:	-10 – 50 °C
L.	Ambient Temperature:	-10 – 50 °C
M.	Protection:	IP 68
N.	MTTF:	732 years

TAG	SERVICE	SCALE
LT-CW	Clearwell Level Transmitter	0-35 feet

6.13 CONTROL RELAYS: Provide a SnapTrack channel mounted relay board with LED status indicator and individual quick-connect terminals. The SnapTrack can be optionally snapped to a DIN rail. The indicator LED shall turn on when the relay is energized. The terminals shall be of the fixed screw cage clamp type, rated for at least 10 amps at 250 Volts. Tubular screw clamp types will not be accepted. The relay shall be rated for 10 amps. Surge suppression shall be provided on the coil side of the relay. The board shall include built-in transient protection across the coil. DC powered versions shall include a built-in diode across the coil to protect external devices from coil surges. The relay and connectors shall be UL approved.

TAG	SERVICE
CR	Control Relay

6.14 DUPLEX PUMP CONTROLLER: Provide a duplex controller to control two pumps that includes the following control functions.

A. OPERATORS AND INDICATORS (for each pump)

1. Manual-Off-Automatic selector switch
2. Green “Pump Running” pilot light
3. Red “Pump Failure” pilot light
4. Red “Pump Seal Failure” pilot light (If Required)

B. A Pump NO. 1 LEAD – ALTERNATE – Pump NO. 2 LEAD sequence selector switch to select either pump as lead pump or to select that the motors alternate as lead pump on each call for cycle.

C. Signal inputs for: stop, lead pump start, lag pump start and a high level alarm. The sensors shall be optically isolated and operate on 12VDC with a maximum current of 12mA for intrinsic safety.

D. Pilot light indicators for each level control input, which includes Start and Stop levels and Running inputs for each pump along with a high-level alarm.

E. A field adjustable failure time delay for each pump, in the range of five (5) seconds to six and a half (6½) minutes, to start the lag pump at the lead pump start point if the lead pump fails or if the lead pump selector switch is placed in the off position. If a pump fails, the remaining functional pump shall remain the lead pump on future cycles. The failed pump shall only be called to operate at the lag pump operating point. Normal pump alternation shall resume when failure condition is corrected and pump has been reset.

F. Soft stop feature to require the motors to stop three (3) seconds apart during the condition that both motors are running when signaled to stop. Soft start feature to require the motors to start three (3) seconds apart during conditions that the lead and lag motors are called for simultaneously.

G. Individual field adjustable time controls to delay starting each pump in the automatic mode after power failure or during initial startup.

H. Pump failure, pump seal failure, and high-level alarm red pilot lights shall flash when activated.

I. Provide pump running, pump failure and seal failure alarm contacts for each pump. In addition, provide a high-level alarm contact.

J. Manual override inputs for each pump, which can be used to manually override the duplex controls', pump outputs when the controls are in the Auto mode. Inputs shall be provided to start or stop each pump from a remote location.

K. Improper sequence alarm (if required) to activate the common alarm in the event the control level inputs are activated in the wrong order. The order shall be Stop, Lead Start, and Lag Start. The High-level alarm shall not be included in the improper sequence test.

L. Provide automatic pump alternation on seal failure when a seal failure condition is detected and the motors are in the automatic mode. The failed pump shall be made the lag pump on future cycles until the failure condition is corrected.

M. An exterior alarm light output which would flash the light brightly during any failure condition. The output shall allow the light to dim glow under normal conditions to indicate that power is on and the lamp is good. A normally open common alarm output contact shall be energized by these alarm conditions.

TAG	SERVICE
DC6-7	Service Pumps Controller

6.15 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	SERVICE
AL	Common Alarm Light

6.16 ANALOG CONVERSION BOARD: Provide an analog conversion board to convert a standard 4-20mA input signal to up to four (4) isolated 4-20mA output signals or up to three (3) isolated 4-20mA signals and one (1) integrator output. Connectors to the unit shall be of the plug-in type for easy servicing. The unit shall provide a High/Low alarm output for the analog input signal which consists of a dual-color LED which shows Green when the input signal is between 4 and 20ma, Red when above 20ma and Off when lower than 4mA and a dry-contact relay output with normally-open and closed contacts rated at 5A, 24VDC / 120VAC resistive. The high and low setpoints shall be adjustable to allow for variations in input signal ranges. The converter shall be provided with a dual-stage surge protection filter. The first stage shall consist of a three element gas tube for heavy surges, having a breakdown rating between 200 and 350 volts. Impulse breakdown at 100 volts per microsecond shall equal 600 volts. The second stage shall be a solid-state transient voltage suppressor rated at 33 volts and 1500 Watts, connected across the input lines.

Up to four isolated modules (channels) shall be provided, depending on the application. Each module's output signal shall be isolated from the input signal and from all other modules. Each module shall contain a green status LED to show the condition of the output at all times. The operation of these modules shall be as follows: (A) If required, supply up to four isolated I/I modules which provide a 4-20mA or 1-5VC output which is isolated from the input signal and every other module used. A diagnostic LED shall be supplied on each module which will be lit when current is flowing in the output loop. The intensity of the LED shall be greater as the current rises. The output signal range shall be adjustable to compensate for any variances in the input signal. (B) If required, supply an optional integrator module which converts the input signal to a proportional dry-contact relay output. The output scale shall be adjustable by means of four rotary switches for a range of 0.1 PPH (Pulses per Hour) to 3600 PPH. The module shall have a diagnostic LED to indicate the integration cycle by turning on each time the output relay is energized. The output relay normally open contact shall be rated for 1 amp @ 24VDC and 0.5 amps @ 115VAC resistive.

TAG	SERVICE
ACB-MFM	Master Flowmeter Signal Splitter

6.17 THERMOSTAT: Provide a non-programmable line volt mechanical thermostat with bi-metal actuator type sensor. The thermostat shall have an adjustable temperature range of 50 to 90 degrees F with a differential of 2 to 4 degrees F. This thermostat shall have a SPDT contact rated at 120V/22A. The thermostat shall be certified UL and CSA. Enclosure shall be NEMA 1 with an external adjustment knob.

TAG	SERVICE
TH	VFD Cooling Fan Thermostat

6.18 POWER SUPPLY: Power supply shall be for 120VAC primary and 13.5VDC secondary and shall have a frequency range of 47-63 Hz with an inrush current of 35A. Secondary adjustment range shall be 12-15VDC. Line and Load regulation shall be ∀0.3%. Output ripple shall be no more than 180mV. Voltage Tolerance shall be ∀1%. Over voltage protection shall clamp at 115-135% and short circuit protection shall be continuous, self-

recovering. Unit shall have a manufacture's warranty of two (2) years.

TAG	SERVICE
DPS	DC Power Supply

6.19 UNINTERRUPTIBLE POWER SUPPLY: Provide a battery charger for 12V DC Sealed Lead Acid rechargeable batteries with an optional 24V DC isolated output. The maximum battery current charging current is 2.9 amps for a completely dead battery and typically less than 0.4 amps for battery voltages over 10V DC. Trickle charging shall stop at a battery voltage of 13.8V DC. The unit shall operate on 13.8V DC with a current rating of up to 11 amps. Provide an optional, integral battery backed up 24V DC option that is capable of being field mounted onto the unit, for powering external 4-20 mA loops or other instrumentation of up to 1 amp maximum load and shall be isolated from the input power supply if necessary. Provide quick-connect terminal blocks for all connectors. Provide High and Low input power supply voltage.

TAG	SERVICE
UPS	Uninterruptible Power Supply

6.20 RECHARGEABLE BATTERY: The battery shall be a sealed Lead-Acid type with ABS plastic case and spill proof construction allowing safe operation in any position. Nominal voltage shall be 12V DC (six cells in series). The nominal capacity shall be 12.0 Ah at a discharge rate of 20 hours (600 mA to 10.5 volts). Terminal configuration shall be via quick disconnect tabs type F1: 0.187" x 0.032". Operating temperature range shall be at least -4° to +122°F. The unit shall be UL recognized.

TAG	SERVICE
BAT	Standby Power Supply

6.21 REMOTE TELEMETRY UNIT: Provide a Remote Telemetry Unit (RTU) featuring an I/O count expandable to twenty (20) digital inputs (DI), twelve (12) digital outputs (DO), eight (8) 4-20 mA analog inputs (AI), two (2) isolated 4-20 mA analog outputs (AO), four (4) RS232 serial ports, one (1) dedicated serial programming port and the capability of "daisy-chaining" another RTU via a serial port for expandability. The unit should be back-plate mounted and 12VDC powered with optional battery backup for operation even under power failure conditions. The programming language shall be 'C'. The microprocessor shall have 512K of Flash memory, 512K of SRAM memory and a Real-Time-Clock. The microprocessor shall run at a minimum of 29.4 MHz. The SRAM and Real-Time-Clock shall be maintained by a lithium battery. Provide separate LED indicators for all digital I/O, analog outputs and serial ports. Digital inputs shall be dry-contact type with a maximum voltage potential of 12VDC. Digital outputs shall be open-collector NPN Darlington transistor type with a maximum current rating of 150 mA per channel. There shall be provisions to support up to eight (8) 4-20 mA analog inputs using plug-on cards. Provide support for two (2) optional isolated 4-20 mA analog outputs. Four (4) standard 9-pin serial ports, all including Tx, Rx, Rts and Dcd pins, shall be provided for external communications and one dedicated serial port for programming. Provide optional 10/100Base-T Ethernet connectivity. The RTU shall have quick-connect plugs for all I/O points.

TAG	SERVICE
RTU	Remote Telemetry Unit

6.22 FIBER OPTIC TO ETHERNET SWITCH: Provide an entry-level, unmanaged, plug-and-play industrial Ethernet switch. Switch shall be compact DIN rail case, have LEDs for power and monitoring, and removable terminal blocks. Switch shall have auto-negotiation of speed, full-duplex and auto-cross, include broadcast storm protection, store and forward mechanism, and back- pressure / IEEE 802.3x flow control. Additionally, the switch contains a 48K byte memory buffer and supports 2K MAC addresses. Switch shall conform to the following specifications.

A. Standards: IEEE802.3, 802.3u, 802.3x
B. Processing Type: Store and forward with IEEE802.3x full duplex, non-blocking flow control
C. Flow Control: IEEE802.3x flow control, back pressure flow control
D. Packet buffer memory: 48 K bytes
E. Address Table Size: 2K MAC Addresses
F. RJ45 Ports: 10/100BaseT(x) auto negation, Full/Half duplex, auto MDI/MDI-connection
G. Fiber Ports: 100BaseFX ports (multi-mode or single-mode with ST or SC connector)
H. LED Indicators: Power, 10/100M (TP port), and 100M (Fiber Port)
I. Input Voltage: 10 to 48 VDC
J. Op. Temperature: 32 to 140 °F (0 to 60°C)
K. Power Use: Copper Model 90mA @ 24VDC; Fiber Optic Models: 140mA @ 24VDC.
L. Storage Temperature: -40 to 176 °F (-40 to 80 °C)
M. Input Connection: Removable Terminal Block
N. Op. Humidity: 0 to 95% Non-condensing
O. Protection: Reverse Polarity Protection
P. MTBF: 248964 hours

TAG	SERVICE
ESW	Fiber Optic to Ethernet Switch

END OF SECTION