SPECIFICATIONS
PROPOSAL AND CONTRACT DOCUMENTS

WASTEWATER TREATMENT PLANT RENOVATION

Prepared for:

WATER WORKS AND SEWER BOARD
OF THE CITY OF GENEVA

JULY, 2018

Prepared by:

Andalusia, Alabama
SPECIFICATIONS

PROPOSAL AND CONTRACT DOCUMENTS

WASTEWATER TREATMENT PLANT
RENOVATION

Prepared for:

WATER WORKS AND SEWER BOARD
OF THE CITY OF GENEVA

GENEVA, ALABAMA

Prepared by:

Southern Engineering Solutions, Inc.
P.O. Box 610
201 East Troy Street
Andalusia, Alabama 36420
(334) 222-1849

July, 2018
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADVERTISEMENT FOR BIDS</td>
<td>1</td>
</tr>
<tr>
<td>INFORMATION FOR BIDDERS</td>
<td>2</td>
</tr>
<tr>
<td>BID BOND</td>
<td>6</td>
</tr>
<tr>
<td>PROPOSAL</td>
<td>8</td>
</tr>
<tr>
<td>AGREEMENT</td>
<td>12</td>
</tr>
<tr>
<td>PAYMENT BOND</td>
<td>15</td>
</tr>
<tr>
<td>PERFORMANCE BOND</td>
<td>17</td>
</tr>
<tr>
<td>NOTICE OF AWARD</td>
<td>19</td>
</tr>
<tr>
<td>NOTICE TO PROCEED</td>
<td>20</td>
</tr>
<tr>
<td>CHANGE ORDER</td>
<td>21</td>
</tr>
<tr>
<td>CERTIFICATION BY OWNER</td>
<td>22</td>
</tr>
<tr>
<td>GENERAL CONDITIONS</td>
<td>23</td>
</tr>
<tr>
<td>SUPPLEMENTAL GENERAL CONDITIONS</td>
<td>36</td>
</tr>
<tr>
<td>SPECIAL SPECIFICATIONS</td>
<td>40</td>
</tr>
<tr>
<td>SPECIFICATIONS FOR STRUCTURAL STEEL</td>
<td>48</td>
</tr>
<tr>
<td>SPECIFICATIONS FOR ALUMINUM PIPE AND TUBE RAILINGS</td>
<td>53</td>
</tr>
<tr>
<td>SPECIFICATIONS FOR ALUMINUM GRATINGS</td>
<td>64</td>
</tr>
<tr>
<td>SPECIFICATIONS FOR SURFACE PREPARATION AND COATING SYSTEM</td>
<td>70</td>
</tr>
</tbody>
</table>
Sealed bids for the construction of WASTEWATER TREATMENT PLANT RENOVATION in Geneva, Alabama will be received by the Geneva Water Works and Sewer Board at Geneva City Hall until 11:00 a.m., Wednesday, February 27, 2019, and then at said location publicly opened and read aloud.

The work generally consists of the renovation of the existing above ground steel wastewater treatment facility including replacement of the clarifier mechanism, completely repainting the interior and exterior of the facility and miscellaneous repairs.

Plans and Specifications for the project may be examined at the Water Works and Sewer Board of the City of Geneva at Geneva City Hall; 517 South Commerce Street; Geneva, Alabama.

A mandatory Pre-Bid Conference will be held at the Geneva City Hall; 11:00 a.m.; Wednesday; February 6, 2019.

To be eligible for consideration, bids must be submitted on complete proposals made available by the Owner. Complete digital project bidding documents are available upon an online payment of a non-refundable fee of $40.00 by visiting our website - www.southernengineeringsolutions.com and clicking the “Currently Bidding” link at the top of the page. A free one-time membership registration with Quest CDN will be required. Please contact questcdn.com at 952-233-1632 or info@questcdn.com if you require assistance in registration, downloading, or working with this digital project information. Optional complete paper bid documents are available at Southern Engineering Solutions, Inc.; P O Box 610; 201 East Troy Street; Andalusia, Alabama 36420, upon payment of a refundable (if plans are returned in reusable condition within 10 days of bid opening) deposit of $80.00. Bid documents will be mailed only upon receipt of deposit. If paper option is chosen, checks shall be made payable to Southern Engineering Solutions, Inc. No paper bid documents will be distributed later than 48 hours prior to the scheduled opening of bids.

The Owner reserves the right to reject any or all bids and to waive any informalities.

Each bidder must submit with his bid, security in the amount, form, and subject to the conditions provided in the Information for Bidders. The successful bidder will be required to submit a 100% performance bond and a 50% payment bond.

All bidders must comply with the requirements of the Contractor's Licensing Law of the State of Alabama and be certified for the type of work for which a proposal is submitted. The submission of the Bidders' current State of Alabama license number will be required before his/her bid will be received or considered.

No bidder may withdraw his bid within 30 days after the actual date of the opening thereof.

Toby Seay, Chairman
Geneva Water Works and Sewer Board
Bids will be received by the Water Works and Sewer Board of the City of Geneva, Alabama (herein called the Owner) at Geneva City Hall, 517 South Commerce Street; Geneva, Alabama 36340 until 11:00 a.m., Wednesday, February 27, 2019, and then at said location publicly opened and read aloud.

Delivery of Proposal. Each bid must be submitted in a sealed envelope, addressed to Geneva Water Works and Sewer Board; P.O. Box 37, Geneva, Alabama 36340.

Each sealed envelope containing a bid must be plainly marked on the outside as "Wastewater Treatment Plant Renovation" and the envelope should bear on the outside the name of the Bidder, his address, his license number and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed to the Water Works and Sewer Board of the City of Geneva; P.O. Box 37, Geneva, Alabama 36340.

A mandatory Pre-Bid Conference will be held at the Geneva City Hall; 11:00 a.m.; Wednesday; February 6, 2018.

Preparation of Bid Form. All bids must be made on the required bid form. All blank spaces for bid prices must be filled in, in ink or typewritten, and the bid form must be fully completed and executed when submitted. Only one copy of the bid form is required.

Withdrawal of Bids. Any bid may be withdrawn prior to the above scheduled time for the opening of the bids or authorized postponement thereof, provided a request in writing executed by the Bidder or his duly authorized representative is filed with the Owner prior to that time. Upon receipt and confirmation of such notice, the unopened bid will be promptly returned. Except as provided in the foregoing, no bid may be withdrawn.

General. The Owner may waive any informalities or minor defects or reject any and all bids. Any bid received after the time and date specified shall not be considered. Except for the condition described below, no Bidder may withdraw a bid within 30 days after the actual date of the opening thereof. Should there be reasons why the contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the Bidder.

Mistakes. The low bidder may seek withdrawal of his bid without forfeiture by providing written notice to the Owner within three working days after the date of the bid opening by providing convincing evidence he made a mistake in his bid caused by calculation or clerical error, an inadvertent omission, or a typographical error which causing his bid to be substantially out of proportion to that of other bidders. The Owner will make a decision within 10 days of receipt of the bidder’s notice, or by the next regular meeting of the awarding authority. In no event, shall a mistake of law, judgement, or opinion constitute valid grounds for withdrawal of a bid without forfeiture. Upon withdrawal of bid without forfeiture, the low bidder who withdraws his bid due to a mistake shall not be allowed to participate in any work on the contract in any capacity, and shall not be allowed to participate in a rebid of the project.

A conditional or qualified Bid will not be accepted.
Award will be made to the lowest responsible Bidder.

**Interpretation of the Quantities in Bid Schedule.** Bidders must satisfy themselves of the accuracy of the estimated quantities in the Bid Schedule by examination of the site of the proposed work and a review of the drawings and specifications, including Addenda. After bids have been submitted, the Bidder shall not assert that there was a misunderstanding concerning the quantities of work or of the nature of the work to be done. Although the estimate of quantities of work listed in the Bid Schedule are the results of calculations made from field survey, they are to be considered as only approximate estimates of the quantities of the different pay items and are to be used only as a basis for comparing bids for awarding the contract. Payment to the Contractor will be made only for the actual quantities of work performed in accordance with the plans and specifications. If, upon completion of construction, the actual quantities of work performed under unit price bids shall show either increase or decrease from the quantities shown in the Bid Schedule, the unit prices bid will prevail, except as otherwise provided for herein.

The right is reserved to increase or decrease any or all of the amounts given in the approximate quantities as shown in the Bid Schedule, with the understanding that the work to be done and the materials to be furnished under unit price bids may be increased or decreased not exceeding twenty-five percent (25%) of the total money value of the contract without in any way invalidating the bid prices.

**Examination of Specifications, Special Provisions and Site of Work.** All Bidders are required to examine carefully the site of the proposed work, the Bid Form, Plans, Standard Specifications, Supplemental Specifications, Special Provisions, Agreement Form and Bond Forms. The submission of a Bid Form shall be prima facie evidence that the Bidder has made such examination and has judged for and satisfied himself as to the conditions to be encountered; as to the character quality and quantities of work to be performed and materials to be furnished; as to the requirements of Plans, Specifications, Supplemental Specifications, Special Provisions, Agreement and Bonds; and as to the contingencies. No adjustments or compensation will be allowed for losses caused by failure to comply with the above requirements.

**Familiarity with Laws and Ordinances.** All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the contract throughout. Bidders shall familiarize themselves with all such applicable laws, ordinances and regulations, and comply with their requirements which may directly or indirectly affect the work or its prosecution, and any materials or equipment used in the work. No adjustments or compensation will be allowed for losses caused by failure to comply with the above requirements.

**Details.** The Bidder must specify for both dollars and cents (without interlineation, alterations or erasures, unless initialed by the signer of the proposal) a unit price for each of the separate items for which a quantity is given in the proposal form (except when alternate bids are called for on items) and shall show the products of the respective unit prices and the estimated quantities in the columns provided for that purpose except that any item noted for a "Lump Sum" bid shall have the same amount under the column provided in the proposal for "Unit Price" as that written numerically in the "Amount Bid" column. All figures shall be inked or typed. The Owner will check the extension of each item given in the proposal and correct all errors or discrepancies. The gross sum obtained by adding all of the products of the unit prices and the various estimated quantities listed in the proposal with the lump sum items shall prevail and this shall be the contract bid price.
**Signing.** The Bidder's proposal must be signed in ink by the individual, by one or more members of the partnership, or by one or more offices of a corporation, or by an agent of the Contractor legally qualified and acceptable to the Owner. If the proposal is made by an individual, his name and post office address must be shown; by a corporation, the name of the corporation and the business address of its corporate officials must be shown. The proposal Bid Bond shall be properly signed by the Bidder and the surety.

**Irregular Proposal.** Proposals will be considered irregular and may be rejected if they contain any omissions, alterations of form, additions not called for, alternate bids unless called for, incomplete bids, erasures or alterations not initialed by the person signing the proposal, or other irregularities of any kind.

**Information.** The Owner shall provide to Bidders prior to Bidding, all information which is pertinent to, and delineates and describes, the land owned and rights-of-way acquired or to be acquired.

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

**Bond Requirements.** Each Bid must be accompanied by a Bid Bond payable to the Owner for five percent of the total amount of the Bid not to exceed $10,000.00. As soon as the Bid prices have been compared, the Owner will return the Bonds of all except the three lowest responsible Bidders. When the Agreement is executed, the Bonds of the two remaining unsuccessful Bidders will be returned. The Bid Bond of the successful Bidder will be retained until the Payment Bond and Performance Bond have been executed and approved, after which it will be returned. A certified check may be used in lieu of a Bid Bond.

A Performance Bond in the amount of 100 percent of the Contract price, with a corporate surety approved by the Owner, will be required for the faithful performance of the contract.

A Payment Bond in the amount of 50 percent of the Contract price, with a Corporate surety approved by the Owner, will be required to guarantee the payment by the Contractor of all costs of labor, materials, equipment, subcontractors, etc. necessary to complete the work in accordance with the Contract.

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

**Execution of Agreement.** The party to whom the contract is awarded will be required to execute the Agreement and obtain the Performance Bond and Payment Bond within fifteen (15) calendar days from the date when Notice of Award is delivered to the Bidder. The Notice of Award shall be accompanied by the necessary Agreement and Bond forms. In case of failure of the Bidder to execute the Agreement, the Owner may at his option consider the Bidder in default, in which case the Bid Bond accompanying the proposal shall become the property of the Owner to be processed in accordance with prevailing law.
The Owner within twenty (20) days of receipt of acceptable Performance Bond, Payment Bond and Agreement signed by the party to whom the Agreement was awarded shall sign the Agreement and return to such party an executed duplicate of the Agreement. Should the Owner not execute the Agreement within such period, the Bidder may by Written Notice withdraw his signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the Owner.

**Notice to Proceed.** The Notice to Proceed shall be issued within fifteen (15) days of the execution of the Agreement by the Owner. Should there be reasons why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between the Owner and the Contractor. If the Notice to Proceed has not been issued within the fifteen (15) day period or within the period mutually agreed upon, the Contractor may terminate the Agreement without further liability on the part of either party.

**Qualifications of Bidders.** The Owner may make such investigations as he deems necessary to determine the ability of the Bidder to perform the work, and the Bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any Bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Agreement and to complete the Work contemplated therein.

**Responsibilities of Bidders.** Each Bidder is responsible for inspecting the site and for reading and being thoroughly familiar with the Contract Documents. The failure or omission of any Bidder to do any of the foregoing shall in no way relieve any Bidder from any obligation in respect to this Bid.

On all Federally funded projects, the Bidder agrees to abide by the requirements under Executive Order No. 11246, as amended, including specifically the provisions of the equal opportunity clause set forth in the Supplemental General Conditions.

The low Bidder shall supply the names and addresses of major material Suppliers, and Subcontractors when requested to do so by the Owner.

**Engineer.** The Engineer is Southern Engineering Solutions, Inc., P. O. Box 610 (201 East Troy Street), Andalusia, Alabama 36420.
BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____________________________ _____________________________ as Principal, and held and firmly bound unto _____________________________ 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, successors and assigns.

Signed, this _____________________________ day of ______________________, 2019.

The Condition of the above obligation is such that whereas the Principal has submitted the Water Works and Sewer Board of the City of Geneva a certain BID, attached hereto and hereby made a part hereof to enter into a contract in writing, for the WASTEWATER TREATMENT PLANT RENOVATION

NOW THEREFORE,

(a) If said BID shall be rejected, or
(b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form 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 herewith, 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.

______________________________________(L.S.) (L.S.)
Principal

______________________________
Surety

By: ______________________________
Proposal for the Construction of

WASTEWATER TREATMENT PLANT RENOVATION
For
The Water Works and Sewer Board of the City of Geneva
Geneva, Alabama

Date: ____________________________

Proposal of ____________________________________________
of ____________________________________________

License No. ____________________________________________, for the construction of

WASTEWATER TREATMENT PLANT RENOVATION

To the Water Works and Sewer Board of the City of Geneva, Alabama, hereinafter referred to as the Owner:

The following proposal is made in behalf of the undersigned Bidder and no others. Evidence of authority to submit the proposal is herewith furnished. The proposal is made without collusion on the part of any other person, firm or corporation.

The undersigned Bidder certifies that he has carefully examined the attached Specifications for this Project, including the Special Provisions, and has personally examined the site of the work. On the basis of the Specifications, the undersigned Bidder proposes to furnish all necessary machinery, tools, apparatus, and other means of construction, and do all the work and furnish all the material in the manner specified.

The undersigned Bidder agrees to commence work under this contract on or before a date to be specified in a written Notice to Proceed issued by the Owner and to fully complete the project within 365 calendar days thereafter.

The undersigned Bidder understands that the quantities below are approximate only and are subject to either increase or decrease and hereby proposes to perform any increase or decrease in quantities of work at the unit price bid.

The undersigned Bidder agrees to perform all "Force Account or Extra Work" that may be required of him on the basis provided in the specifications attached, and to give such work his personal attention in order to see that it is economically performed.

The undersigned Bidder also proposes to furnish a Performance Bond, in an amount equal to the total amount of his bid. This bond shall serve not only to guarantee the completion of the work on the part of the undersigned Bidder, but also to guarantee the excellence of both workmanship and materials until the work is finally accepted.
The undersigned Bidder encloses a Certified Check or Bid Bond in the amount of 5% of amount bid, not to exceed $50,000.00 and hereby agrees that in case of his failure to execute a contract and furnish the required bond within 15 days after Notice of Award, the amount of the check or Bid bond will be forfeited to the owner as liquidated damages arising out of his failure to execute a contract as proposed. It is understood that in case the work is not awarded to the undersigned Bidder, the check or Bid bond will be returned as provided in the Specifications hereto attached.

The undersigned Bidder agrees to pay to the Owner as liquidated damages the amount of **$200.00** per calendar day for any overrun in contract time for which a time extension is not granted by the Owner, as provided in Section 5 of the Supplemental General Conditions.

The undersigned Bidder acknowledges receipt of the following Addenda:

No.__________, Dated__________.  No.__________, Dated__________.  
No.__________, Dated__________.  No.__________, Dated__________.

The Bidder agrees that this bid shall be good and may not be withdrawn for a period of 30 calendar days after the scheduled closing time for receiving bids, except as approved by the Owner.

The Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

The undersigned Bidder agrees to perform all the work described in the Contract Documents for the following unit prices:
<table>
<thead>
<tr>
<th>ITEM</th>
<th>QTY</th>
<th>UNIT</th>
<th>UNIT PRICE</th>
<th>TOTAL COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mobilization</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>2. Sand and Debris Removal</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>3. Additional Sand and Debris Removal</td>
<td>200</td>
<td>CY</td>
<td>$</td>
<td>$</td>
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<tr>
<td>4. Replace Clarifier Internals and Drive</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>5. Replace Influent Box and Bar Screen</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
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<tr>
<td>6. Remove Inlet Trough and Supports</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>7. Replace Return Sludge Assembly and Sludge Box</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>8. Install New Waste Sludge Airlift Assembly</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>9. New Walkway to Access Effluent Sampler</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
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<tr>
<td>10. Install Toe Plates on Existing Peripheral Walkway</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
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<tr>
<td>11. Install Truss Handrail system on Clarifier Bridge</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
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<tr>
<td>12. Replace Walkway from Clarifier Wall to Exterior Wall</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
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<tr>
<td>13. Modify Existing Clarifier Bridge Support Beam</td>
<td>20</td>
<td>SF</td>
<td>$</td>
<td>$</td>
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<tr>
<td>14. Replace Diffuser Drop Pipe Supports</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>15. New Supernatant Decant Airlift Assembly</td>
<td>1</td>
<td>EA</td>
<td>$</td>
<td>$</td>
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<tr>
<td>16. Repair and Replace Deteriorated Bulkhead Sections</td>
<td>500</td>
<td>SF</td>
<td>$</td>
<td>$</td>
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<tr>
<td>17. Repair Deteriorated Clarifier and Outer Walls</td>
<td>100</td>
<td>SF</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>18. Replace 12&quot;x8&quot; Air Header</td>
<td>20</td>
<td>LF</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>19. Replace 3&quot;x4&quot; Tubing</td>
<td>20</td>
<td>LF</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>20. Replace V-Notch Weir</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>21. Install New Chlorination Diffuser System</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>22. Install Temporary Aeration Basin Bypass Piping</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>23. Install Temporary 12&quot; Chlorine Contact Bypass Piping</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>24. Install Temporary Chlorine Contact Tank and Effluent Piping</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>25. Interior Sandblasting and Surface Preparation</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>26. Interior Painting/Recouling</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>27. Exterior Sandblasting and Surface Preparation</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>28. Exterior Painting/Recouling</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>29. Pit Filler</td>
<td>10</td>
<td>GAL</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>30. Remove Froth Spray System and Miscellaneous Items</td>
<td>1</td>
<td>LS</td>
<td>$</td>
<td>$</td>
</tr>
</tbody>
</table>

**TOTAL BASE BID** $__________
Signature of Bidder (if a firm or individual) _________________________________________

By __________________________________________

Address of Bidder _____________________________________________________________

Names and addresses of members of firm _________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

Signature of Bidder (if a corporation) _____________________________________________

__________________________________________  ______________________________

President       Address

__________________________________________

Secretary       Address

__________________________________________

Treasurer       Address

Corporate Seal

Name of state under the law of which the corporation is chartered:

Attest: _______________________________  _______________________________

Secretary
AGREEMENT

THIS AGREEMENT, made this ___ day of ____________, 2019, by and between the Water Works and Sewer Board of the City of Geneva, Alabama, hereinafter called "OWNER" and ____________________________________________________________________________ doing business as (an individual,) or (a partnership,) or (a corporation) hereinafter called "CONTRACTOR".

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned:

1. The CONTRACTOR will commence and complete the construction of

   WASTEWATER TREATMENT PLANT RENOVATION

2. The CONTRACTOR will furnish all of the material, supplies, tools, equipment, labor and other services necessary for the construction and completion of the PROJECT described herein.

3. The CONTRACTOR will commence the work required by the CONTRACT DOCUMENTS within 10 calendar days after the date of the NOTICE TO PROCEED and will complete the same within 365 calendar days unless the period for completion is extended otherwise by the CONTRACT DOCUMENTS.

4. The CONTRACTOR agrees to perform all of the WORK described in the CONTRACT DOCUMENTS and comply with the terms therein for the sum of ________________________________, or as shown in the BID schedule.

5. The term "CONTRACT DOCUMENTS" means and includes the following:

   (A) ADVERTISEMENT FOR BIDS
   (B) INFORMATION FOR BIDDERS
   (C) BID
   (D) BID BOND
   (E) AGREEMENT
6. The OWNER will pay to the CONTRACTOR in the manner and at such times as set forth in the General Conditions such amounts as required by the CONTRACT DOCUMENTS.

7. This AGREEMENT shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.
IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in three (3) each of which shall be deemed an original on the date first above written.

OWNER:

Water Works and Sewer Board of the City of Geneva

BY ______________________________

Name ____ James Dixon ____________

Title ____ Manager ________________

(SEAL)

ATTEST:

_______________________________

Name ___________________________

(Please Type)

Title ___________________________

CONTRACTOR:

_______________________________

BY ______________________________

Name ___________________________

(Please Type)

(SEAL) Address ______________________

_______________________________

ATTEST:

_______________________________

Name ___________________________

(Please Type)
PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a ____________________________, herein called Principal, and
(Corporation, Partnership of Individual)

(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

Water Works and Sewer Board of the City of Geneva;
P.O. Box 37; Geneva, AL  36340

hereinafter called OWNER, in the penal sum of ______________, 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 the ______ day of ______, 2019, a copy of which is hereto attached and made a part hereof for the construction of:

WASTEWATER TREATMENT PLANT RENOVATION

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 instrument is executed in three (3) counterparts, each one of which shall be deemed an original, this the ______ day of ____________, 2019.

ATTEST:

_________________________________________                  ___________________________________________
(Principal) Secretary                                          Principal
(SEAL)                                                              By _______________________________(s)

_________________________________________
Witness as to Principal

_________________________________________
(Address)

ATTEST:

_________________________________________
(Surety) Secretary
(SEAL)

_________________________________________
Witness as to Surety

_________________________________________
(Address)

_________________________________________
(Address)

______________________________
(Surety) Secretary
(SEAL)

______________________________
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.
PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: that

___________________________________________, hereinafter called Principal, and

___________________________________________, hereinafter called Surety, are held and firmly bound unto

______________________________,

hereinafter called OWNER, in the penal sum of

___________________________________________,

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 the _______ day of _________, 2019, a copy of which is hereto attached and made a part hereof for the construction of:

WASTEWATER TREATMENT PLANT RENOVATION

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 fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to 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 instrument is executed in **three (3)** counterparts, each on of which shall be deemed an original, this the _____ day of __________________, 2019.

ATTEST:

________________________________________  ____________________________
(Principal) Secretary                                    Principal
(SEAL)                                                      By __________________________ (s)

________________________________________
Witness as to Principal
(Address)

________________________________________
(Address)

ATTEST:

________________________________________  ____________________________
(Surety) Secretary                                    Surety
(SSEAL)                                                      By __________________________

________________________________________
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.
NOTICE OF AWARD

To:

PROJECT Description:  WASTEWATER TREATMENT PLANT RENOVATION

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for Bids dated ____________, 2019, and Information for Bidders.

You are hereby notified that your BID has been accepted for items in the amount of

_____________________________________________________________________.

You are required by the Information for Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, Payment BOND and certificates of insurance within fifteen (15) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said BONDS within fifteen (15) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID 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 to the OWNER.

Dated this _____ day of ________________, 2019.

Water Works and Sewer Board
of the City of Geneva, Alabama
Owner

By  __________________________
Title      Manager

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged

by  __________________________

this the ____ day of ____________, 2019

By  __________________________
Title __________________________
NOTICE TO PROCEED

To: _________________________ Date: _________________________

PROJECT Description: WASTEWATER TREATMENT PLANT RENOVATION

You are hereby notified to commence WORK in accordance with the Agreement dated __________, 2019, on or before ________________, 2019, and you are to complete the WORK within sixty (60) consecutive calendar days thereafter.

The date of completion of all WORK is therefore ________________, 20____.

Water Works and Sewer Board of the City of Geneva, Alabama
Owner

By _________________________

Title __________ Manager

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by _________________________

this the ___ day of __________, 2019

By _________________________

Title _________________________
CHANGE ORDER

Order No.

Date:

Agreement Date:

NAME OF PROJECT:

OWNER:

CONTRACTOR:

The following changes are hereby made to the CONTRACT DOCUMENTS:

Justification:

Change to CONTRACT PRICE:

Original CONTRACT PRICE: $ 

Current CONTRACT PRICE adjusted by previous CHANGE ORDER:

The CONTRACT PRICE including this CHANGE ORDER will be (increased) (decreased) by: $ 

The new CONTRACT PRICE including this CHANGE ORDER will be $ 

Change to CONTRACT TIME:

The CONTRACT TIME will be (increased) (decreased) by ________ calendar days.

The date for completion of all work will be ________________(Date).

Approvals Required:
To be effective this Order must be approved by the Federal agency if it changes the scope or objective of the PROJECT, or as may otherwise be required by the SUPPLEMENTAL GENERAL CONDITIONS.

Requested by:

Recommended by:

Ordered by:

Accepted by:

Federal Agency Approval (where applicable)
CERTIFICATION BY OWNER

I, the undersigned, ____________________________, the duly authorized and acting official representative of the Water Works and Sewer Board of the City of Geneva, Alabama do hereby certify as follows:

This contract is let in compliance with the provisions of Title 39, Code of Alabama (1975, as amended), and all other applicable provisions of law.

Signature____________________________

Title ____________________________

Date ______________________________
1. Definitions

1.1 Wherever used in the CONTRACT DOCUMENTS, the following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof:

1.2 ADDENDA -- Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the CONTRACT DOCUMENTS, DRAWINGS and SPECIFICATIONS, by additions, deletions, clarifications or corrections.

1.3 BID -- The offer or proposal of the BIDDER submitted on the prescribed form setting forth the prices for the WORK to be performed.

1.4 BIDDER -- Any person, firm or corporation submitting a BID for the WORK.

1.5 BONDS -- Bid, Performance, and Payment Bonds and other instruments of security, furnished by the CONTRACTOR and his surety in accordance with the CONTRACT DOCUMENTS.

1.6 CHANGE ORDER -- A written order to the CONTRACTOR authorizing an addition, deletion or revision in the WORK within the general scope of the CONTRACT DOCUMENTS, or authorizing an adjustment in the CONTRACT PRICE or CONTRACT TIME.

1.7 CONTRACT DOCUMENTS -- The contract, including Advertisement For Bids, Information for Bidders, BID, Bid Bond, Agreement, Payment Bond, Performance Bond, NOTICE OF AWARD, NOTICE TO PROCEED, CHANGE ORDER, DRAWINGS, SPECIFICATIONS, and ADDENDA.

1.8 CONTRACT PRICE -- The total monies payable to the CONTRACTOR under the terms and conditions of the CONTRACT DOCUMENTS.

1.9 CONTRACT TIME -- The number of calendar days stated in the CONTRACT DOCUMENTS for the completion of the WORK.

1.10 CONTRACTOR -- The person, firm or corporation with whom the OWNER has executed the Agreement.

1.11 DRAWINGS -- The part of the CONTRACT DOCUMENTS which show the characteristics and scope of the WORK to be performed and which have been prepared or approved by the ENGINEER.

1.12 ENGINEER -- The person, firm or corporation named as such in the CONTRACT DOCUMENTS.
1.13 FIELD ORDER -- A written order effecting a change in the WORK not involving an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, issued by the ENGINEER to the CONTRACTOR during construction.

1.14 NOTICE OF AWARD -- The written notice of the acceptance of the BID from the OWNER to the successful BIDDER.

1.15 NOTICE TO PROCEED -- Written communication issued by the OWNER to the CONTRACTOR authorizing him to proceed with the WORK and establishing the date of commencement of the WORK.

1.16 OWNER -- A public or quasi-public body or authority, corporation, association, partnership, or individual for whom the WORK is to be performed.

1.17 PROJECT -- The undertaking to be performed as provided in the CONTRACT DOCUMENTS.

1.18 RESIDENT PROJECT REPRESENTATIVE -- The authorized representative of the OWNER who is assigned to the PROJECT site or any part thereof.

1.19 SHOP DRAWINGS -- All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the CONTRACTOR, a SUBCONTRACTOR, manufacturer, SUPPLIER or distributor, which illustrate how specific portions of the WORK shall be fabricated or installed.

1.20 SPECIFICATIONS -- A part of the CONTRACT DOCUMENTS consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship.

1.21 SUBCONTRACTOR -- An individual, firm or corporation having a direct contract with the CONTRACTOR or with any other SUBCONTRACTOR for the performance of a part of the work at the site.

1.22 SUBSTANTIAL COMPLETION -- That date as certified by the ENGINEER when the construction of the PROJECT or a specified part thereof is sufficiently completed, in accordance with the CONTRACT DOCUMENTS, so that the PROJECT or specified part can be utilized for the purposes for which it is intended.

1.23 SUPPLEMENTAL GENERAL CONDITIONS -- Modifications to General Conditions required by a Federal agency for participation in the PROJECT and approved by the agency in writing prior to inclusion in the CONTRACT DOCUMENTS, or such requirements that may be imposed by applicable state laws.

1.24 SUPPLIER -- Any person or organization who supplies materials or equipment for the WORK, including that fabricated to a special design, but who does not perform labor at the site.

1.25 WORK -- All labor necessary to produce the construction required by the CONTRACT DOCUMENTS, and all materials and equipment incorporated or to be incorporated in the PROJECT.

1.26 WRITTEN NOTICE--Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the WORK.

2. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

2.1 The CONTRACTOR may be furnished additional instructions and detail drawings, by the ENGINEER, as necessary to carry out the WORK required by the CONTRACT DOCUMENTS.

2.2 The additional drawings and instruction thus supplied will become a part of the CONTRACT DOCUMENTS. The CONTRACTOR shall carry out the WORK in accordance with the additional detail drawings and instructions.
3. SCHEDULES, REPORTS AND RECORDS

3.1 The CONTRACTOR shall submit to the OWNER such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data where applicable as are required by the CONTRACT DOCUMENTS for the WORK to be performed.

3.2 Prior to the first partial payment estimate the CONTRACTOR shall submit construction progress schedules showing the order in which he proposes to carry on the WORK, including dates at which he will start the various parts of the WORK, estimated date of completion of each part and, as applicable:

3.2.1 The dates at which special detail drawings will be required; and

3.2.2 Respective dates for submission of SHOP DRAWINGS, the beginning of manufacture, the testing and the installation of materials, supplies and equipment.

3.3 The CONTRACTOR shall also submit a schedule of payments that he anticipates he will earn during the course of the WORK.

4. DRAWINGS AND SPECIFICATIONS

4.1 The intent of the DRAWINGS and SPECIFICATIONS is that the CONTRACTOR shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the WORK in accordance with the CONTRACT DOCUMENTS and all incidental work necessary to complete the PROJECT in an acceptable manner, ready for use, occupancy or operation by the OWNER.

4.2 In case of conflict between the DRAWINGS and SPECIFICATIONS, the SPECIFICATIONS shall govern. Figure dimensions on DRAWINGS shall govern over scale dimensions, and detailed DRAWINGS shall govern over general DRAWINGS.

4.3 Any discrepancies found between the DRAWINGS and SPECIFICATIONS and site conditions or any inconsistencies or ambiguities in the DRAWINGS or SPECIFICATIONS shall be immediately reported to the ENGINEER, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. WORK done by the CONTRACTOR after his discovery of such discrepancies, inconsistencies or ambiguities shall be done at the CONTRACTOR’S risk.

5. SHOP DRAWINGS

5.1 The CONTRACTOR shall provide SHOP DRAWINGS as may be necessary for the prosecution of the WORK as required by the CONTRACT DOCUMENTS. The ENGINEER shall promptly review all SHOP DRAWINGS. The ENGINEER'S approval of any SHOP DRAWING shall not release the CONTRACTOR from responsibility for deviations from the CONTRACT DOCUMENTS. The approval of any SHOP DRAWING which substantially deviates from the requirement of the CONTRACT DOCUMENTS shall be evidenced by a CHANGE ORDER.

5.2 When submitted for the ENGINEER'S review, SHOP DRAWINGS shall bear the CONTRACTOR’S certification that he has reviewed, checked and approved the SHOP DRAWINGS and that they are in conformance with the requirements of the CONTRACT DOCUMENTS.

5.3 Portions of the WORK requiring a SHOP DRAWING or sample submission shall not begin until the SHOP DRAWING or submission has been approved by the ENGINEER. A copy of each approved SHOP DRAWING and each approved sample shall be kept in good order by the CONTRACTOR at the site and shall be available to the ENGINEER.
6. MATERIALS, SERVICES AND FACILITIES

6.1 It is understood that, except as otherwise specifically stated in the CONTRACT DOCUMENTS, the CONTRACTOR shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the WORK within the specified time.

6.2 Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the WORK. Stored materials and equipment to be incorporated in the WORK shall be located so as to facilitate prompt inspection.

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

6.4 Materials, supplies and equipment shall be in accordance with samples submitted by the CONTRACTOR and approved by the ENGINEER.

6.5 Materials, supplies or equipment to be incorporated into the WORK shall not be purchased by the CONTRACTOR or the SUBCONTRACTOR subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

7. INSPECTION AND TESTING

7.1 All materials and equipment used in the construction of the PROJECT shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the CONTRACT DOCUMENTS.

7.2 The OWNER shall provide all inspection and testing services not required by the CONTRACT DOCUMENTS.

7.3 The CONTRACTOR shall provide at his expense the testing and inspection services required by the CONTRACT DOCUMENTS.

7.4 If the CONTRACT DOCUMENTS, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any WORK to specifically be inspected, tested, or approved by someone other than the CONTRACTOR, the CONTRACTOR will give the ENGINEER timely notice of readiness. The CONTRACTOR will then furnish the ENGINEER the required certificates of inspection, testing or approval.

7.5 Inspections, tests or approvals by the engineer or others shall not relieve the CONTRACTOR from his obligations to perform the WORK in accordance with the requirements of the CONTRACT DOCUMENTS.

7.6 The ENGINEER and his representatives will at all times have access to the WORK. In addition, authorized representatives and agents of any participating Federal or state agency shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records. The CONTRACTOR will provide proper facilities for such access and observation of the WORK and also for any inspection, or testing thereof.

7.7 If any WORK is covered contrary to the written instructions of the ENGINEER it must, if requested by the ENGINEER, be uncovered for his observation and replaced at the CONTRACTOR’S expense.

7.8 If the ENGINEER considers it necessary or advisable that covered WORK be inspected or tested by others, the CONTRACTOR, at the ENGINEER’S request, will uncover, expose or otherwise make available for observation, inspection or testing as the ENGINEER may require, that portion of the WORK in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such WORK is defective, the CONTRACTOR will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If, however, such WORK is not found to be defective, the CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate CHANGE ORDER shall be issued.
8. **SUBSTITUTIONS**

8.1 Whenever a material, article or piece of equipment is identified on the DRAWINGS or SPECIFICATIONS by reference to brand name or catalogue number, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function shall be considered. The CONTRACTOR may recommend the substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the CONTRACT DOCUMENTS by reference to brand name or catalogue number, and if, in the opinion of the ENGINEER, such material, article, or piece of equipment is of equal substance and function to that specified, the ENGINEER may approve its substitution and use by the CONTRACTOR. Any cost differential shall be deductible from the CONTRACT PRICE and the CONTRACT DOCUMENTS shall be appropriately modified by CHANGE ORDER. The CONTRACTOR warrants that if substitutes are approved, no major changes in the function or general design of the PROJECT will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the CONTRACTOR without a change in the CONTRACT PRICE or CONTRACT TIME.

9. **PATENTS**

9.1 The CONTRACTOR shall pay all applicable royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and save the OWNER harmless from loss on account thereof, except that the OWNER shall be responsible for any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is specified, however if the CONTRACTOR has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the ENGINEER.

10. **SURVEYS, PERMITS, REGULATIONS**

10.1 The OWNER shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the WORK together with a suitable number of bench marks adjacent to the WORK as shown in the CONTRACT DOCUMENTS. From the information provided by the OWNER, unless otherwise specified in the CONTRACT DOCUMENTS, the CONTRACTOR shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stakes for pile locations and other working points, lines, elevations and cut sheets.

10.2 The CONTRACTOR shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

10.3 Permits and licenses of a temporary nature necessary for the prosecution of the WORK shall be secured and paid for by the CONTRACTOR unless otherwise stated in the SUPPLEMENTAL GENERAL CONDITIONS. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the OWNER, unless otherwise specified. The CONTRACTOR shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the WORK as drawn and specified. If the CONTRACTOR observes that the CONTRACT DOCUMENTS are at variance therewith, he shall promptly notify the ENGINEER in writing, and any necessary changes shall be adjusted as provided in Section 13, CHANGES IN THE WORK.

11. **PROTECTION OF WORK, PROPERTY AND PERSONS**

11.1 The CONTRACTOR will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the WORK. He will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to all employees on the WORK and other persons who may be affected thereby, all the WORK and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

11.2 The CONTRACTOR will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He will erect and maintain, as required by the conditions and progress of the WORK, all
necessary safeguards for safely and protection. He will notify owners of adjacent utilities when prosecution of the WORK may affect them. The CONTRACTOR will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the CONTRACTOR, any SUBCONTRACTOR or anyone directly or indirectly employed by any of them or anyone for whose acts any of them be liable, except damage or loss attributable to the fault of the CONTRACT DOCUMENTS or to the acts or omissions of the OWNER or the ENGINEER or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the CONTRACTOR.

11.3 In emergencies affecting the safety of persons or the WORK or property at the site or adjacent thereto, the CONTRACTOR, without special instruction or authorization from the ENGINEER or OWNER, shall act to prevent threatened damage, injury or loss. He will give the ENGINEER prompt WRITTEN NOTICE of any significant changes in the WORK or deviations from the CONTRACT DOCUMENTS caused thereby, and a CHANGE ORDER shall thereupon be issued covering the changes and deviations involved.

12. SUPERVISION BY CONTRACTOR

12.1 The CONTRACTOR will supervise and direct the WORK. He will be solely responsible for the means, methods, techniques, sequences and procedures of construction. The CONTRACTOR will employ and maintain on the WORK a qualified supervisor or superintendent who shall have been designated in writing by the CONTRACTOR as the CONTRACTOR’S representative at the site. The supervisor shall have full authority to act on behalf of the CONTRACTOR and all communications given to the supervisor shall be as binding as if given to the CONTRACTOR. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the WORK.

13. CHANGES IN THE WORK

13.1 The OWNER may at any time, as the need arises, order changes within the scope of the WORK without invalidating the Agreement. If such changes increase or decrease the amount due under the CONTRACT DOCUMENTS, or in the time required for performance of the WORK, an equitable adjustment shall be authorized by CHANGE ORDER.

13.2 The ENGINEER, also, may at any time, by issuing a FIELD ORDER, make changes in the details of the WORK. The CONTRACTOR shall proceed with the performance of any changes in the WORK so ordered by the ENGINEER unless the CONTRACTOR believes that such FIELD ORDER entitles him to a change in CONTRACT PRICE or TIME, or both, in which event he shall give the ENGINEER WRITTEN NOTICE thereof within seven (7) days after the receipt of the ordered change. Thereafter the CONTRACTOR shall document the basis for the change in CONTRACT PRICE or TIME within thirty (30) days. The CONTRACTOR shall not execute such changes pending the receipt of an executed CHANGE ORDER or further instruction from the OWNER.

14. CHANGES IN CONTRACT PRICE

14.1 The CONTRACT PRICE may be changed only by a CHANGE ORDER. The value of any WORK covered by a CHANGE ORDER or of any claim for increase or decrease in the CONTRACT PRICE shall be determined by one or more of the following methods in the order of precedence listed below:

(a) Unit prices previously approved.
(b) An agreed lump sum.
(c) The actual cost for labor, direct overhead, materials, supplies, equipment, and other services necessary to complete the work. In addition there shall be added an amount to be agreed upon but not to exceed fifteen (15) percent of the actual cost of the WORK to cover the cost of general overhead and profit.

15. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

15.1 The date of beginning and the time for completion of the WORK are essential conditions of the CONTRACT DOCUMENTS and the WORK embraced shall be commenced on a date specified in the NOTICE TO PROCEED.
15.2 The CONTRACTOR will proceed with the WORK at such rate of progress to insure full completion within the CONTRACT TIME. It is expressly understood and agreed, by and between the CONTRACTOR and the OWNER, that the CONTRACT TIME for the completion of the WORK described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the WORK.

15.3 If the CONTRACTOR shall fail to complete the WORK within the CONTRACT TIME, or extension of time granted by the OWNER, then the CONTRACTOR will pay to the OWNER the amount for liquidated damages as specified in the BID for each calendar day that the CONTRACTOR shall be in default after the time stipulated in the CONTRACT DOCUMENTS.

15.4 The CONTRACTOR shall not be charged with liquidated damages or any excess cost when the delay in completion of the WORK is due to the following, and the CONTRACTOR has promptly given WRITTEN NOTICE of such delay to the OWNER or ENGINEER.

15.4.1 To any preference, priority or allocation order duly issued by the OWNER.

15.4.2 To unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including but not restricted to, acts of God, or of the public enemy, acts of the OWNER, acts of another CONTRACTOR in the performance of a contract with the OWNER, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather: and

15.4.3 To any delays of SUBCONTRACTORS occasioned by any of the causes specified in paragraphs 15.4.1 and 15.4.2 of this article.

16. CORRECTION OF WORK

16.1 The CONTRACTOR shall promptly remove from the premises all WORK rejected by the ENGINEER for failure to comply with the CONTRACT DOCUMENTS, whether incorporated in the construction or not, and the CONTRACTOR shall promptly replace and re-execute the WORK in accordance with the CONTRACT DOCUMENTS and without expense to the OWNER and shall bear the expense of making good all WORK of other CONTRACTORS destroyed or damaged by such removal or replacement.

16.2 All removal and replacement WORK shall be done at the CONTRACTOR'S expense. If the CONTRACTOR does not take action to remove such rejected WORK within ten (10) days after receipt of WRITTEN NOTICE, the OWNER may remove such WORK and store the materials at the expense of the CONTRACTOR.

17. SUBSURFACE CONDITIONS

17.1 The CONTRACTOR shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the OWNER by WRITTEN NOTICE of:

17.1.1 Subsurface or latent physical conditions at the site differing materially from those indicated in the CONTRACT DOCUMENTS: or

17.1.2 Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in WORK of the character provided for in the CONTRACT DOCUMENTS.

17.2 The OWNER shall promptly investigate the conditions, and if he finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the WORK, an equitable adjustment shall be made and the CONTRACT DOCUMENTS shall be modified by a CHANGE ORDER. Any claim of the CONTRACTOR for adjustment hereunder shall not be allowed unless he has given the required WRITTEN NOTICE; provided that the OWNER may, if he determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.
18. SUSPENSION OF WORK, TERMINATION AND DELAY

18.1 The OWNER may suspend the WORK or any portion thereof for a period of not more than ninety days or such further time as agreed upon by the CONTRACTOR by WRITTEN NOTICE to the CONTRACTOR and the ENGINEER which notice shall fix the date on which WORK shall be resumed. The CONTRACTOR will resume that WORK on the date so fixed. The CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to any suspension.

18.2 If the CONTRACTOR is adjudged as bankrupt or insolvent, or if he makes a general assignment for the benefit of his creditors, or if a trustee or receiver is appointed for the CONTRACTOR or for any of his property, or if he files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or if he repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if he repeatedly fails to make prompt payments to SUBCONTRACTORS or for labor, materials or equipment or if he disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction of the WORK or if he disregards the authority of the ENGINEER, or if he otherwise violates any provision of the CONTRACT DOCUMENTS, then the OWNER may, without prejudice to any other right or remedy and after giving the CONTRACTOR and his surety a minimum of ten (10) days from delivery of a WRITTEN NOTICE, terminate the services of the CONTRACTOR and take possession of the PROJECT and of all materials, equipment, tools, construction equipment and machinery, thereon owned by the CONTRACTOR, and finish the WORK by whatever method he may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the WORK is finished. If the unpaid balance of the CONTRACT PRICE exceeds the direct and indirect costs of completing the PROJECT, including compensation for additional professional services, such excess SHALL BE PAID TO THE CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR will pay the difference to the OWNER. Such costs incurred by the OWNER will be determined by the ENGINEER and incorporated in a CHANGE ORDER.

18.3 Where the CONTRACTOR'S services have been so terminated by the OWNER, said termination shall not affect any right of the OWNER against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by the OWNER due the CONTRACTOR will not release the CONTRACTOR from compliance with the CONTRACT DOCUMENTS.

18.4 After ten (10) days from delivery of a WRITTEN NOTICE to the CONTRACTOR and the ENGINEER, the OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the PROJECT and terminate the Contract. In such case, the CONTRACTOR shall be paid for all WORK executed and all expenses sustained plus reasonable profit.

18.5 If, through no act or fault of the CONTRACTOR, the WORK is suspended for a period of more than ninety (90) days by the OWNER or under an order of court or other public authority, or the ENGINEER fails to act on any request for payment within thirty (30) days after it is submitted or the OWNER fails to pay the CONTRACTOR substantially the sum approved by the ENGINEER or awarded by arbitrators within thirty (30) days of its approval and presentation, then the CONTRACTOR may, after ten (10) days from delivery of a WRITTEN NOTICE to the OWNER and the ENGINEER, terminate the CONTRACT and recover from the OWNER payment for all WORK executed and all expenses sustained. In addition and in lieu of terminating the CONTRACT, if the ENGINEER has failed to act on a request for payment or if the OWNER has failed to make any payment as aforesaid, the CONTRACTOR may upon ten (10) days written notice to the OWNER and the ENGINEER stop the WORK until he has been paid all amounts then due, in which event and upon resumption of the WORK, CHANGE ORDERS shall be issued for adjusting the CONTRACT PRICE or extending the CONTRACT TIME or both to compensate for the costs and delays attributable to the stoppage of the WORK.

18.6 If the performance of all or any portion of the WORK is suspended, delayed, or interrupted as a result of a failure of the OWNER or ENGINEER to act within the time specified in the CONTRACT DOCUMENTS, or if no time is specified, within a reasonable time, an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, shall be made by CHANGE ORDER to compensate the CONTRACTOR for the costs and delays necessarily caused by the failure of the OWNER or ENGINEER.
19. PAYMENTS TO CONTRACTOR

19.1 At least ten (10) days before each progress payment falls due (but not more often than once a month), the CONTRACTOR will submit to the ENGINEER a partial payment estimate filled out and signed by the CONTRACTOR covering the WORK performed during the period covered by the partial payment estimate and supported by such data as the ENGINEER may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the WORK but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the OWNER, as will establish the OWNER's title to the material and equipment and protect his interest therein, including applicable insurance. The ENGINEER will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing his approval of payment and present the partial payment estimate to the OWNER, or return the partial payment estimate to the CONTRACTOR indicating in writing his reasons for refusing to approve payment. In the latter case, the CONTRACTOR may make the necessary corrections and resubmit the partial payment estimate. The OWNER will, within ten (10) days of presentation to him of an approved partial payment estimate, pay the CONTRACTOR a progress payment on the basis of the approved partial payment estimate. The OWNER shall retain ten (10) percent of the amount of each payment until final completion and acceptance of all work covered by the CONTRACT DOCUMENTS. The OWNER at any time, however, after fifty (50) percent of the WORK has been completed, if he finds that satisfactory progress is being made, shall reduce retainage to five (5%) percent on the current and remaining estimates. When the WORK is substantially complete (operational or beneficial occupancy), the retained amount may be further reduced below five (5) percent to only that amount necessary to assure completion. On completion and acceptance of a part of the WORK on which the price is stated separately in the CONTRACT DOCUMENTS, payment may be made in full, including retained percentages, less authorized deductions.

19.2 The request for payment may also include an allowance for the cost of such major materials and equipment which are suitably stored either at or near the site.

19.3 Prior to SUBSTANTIAL COMPLETION, the OWNER, with the approval of the ENGINEER and with the concurrence of the CONTRACTOR, may use any completed or substantially completed portions of the WORK. Such use shall not constitute an acceptance of such portions of the WORK.

19.4 The OWNER shall have the right to enter the premises for the purpose of doing work not covered by the CONTRACT DOCUMENTS. This provision shall not be construed as relieving the CONTRACTOR of the sole responsibility for the care and protection of the WORK, or the restoration of any damaged WORK except such as may be caused by agents or employees of the OWNER.

19.5 Upon completion and acceptance of the WORK, the ENGINEER shall issue a certificate attached to the final payment request that the WORK has been accepted by him under the conditions of the CONTRACT DOCUMENTS. The entire balance found to be due the CONTRACTOR, including the retained percentages, but except such sums as may be lawfully retained by the OWNER, shall be paid to the CONTRACTOR within thirty (30) days of completion and acceptance of the WORK.

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

19.7 If the OWNER fails to make payment thirty (30) days after approval by the ENGINEER, in addition to other remedies available to the CONTRACTOR, there shall be added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the CONTRACTOR.
20. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

20.1 The acceptance by the CONTRACTOR of final payment shall be and shall operate as a release to the OWNER of all claims and all liability to the CONTRACTOR other than claims in stated amounts as may be specifically excepted by the CONTRACTOR for all things done or furnished in connection with this WORK and for every act and neglect of the OWNER and others relating to or arising out of this WORK. Any payment, however, final or otherwise, shall not release the CONTRACTOR or his sureties from any obligations under the CONTRACT DOCUMENTS or the Performance BOND and Payment BONDS.

21. INSURANCE

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

21.1.1 Claims under workmen's compensation, disability benefit and other similar employee benefit acts;
21.1.2 Claims for damages because of bodily, injury, occupational sickness or disease, or death of his employees;
21.1.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;
21.1.4 Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the CONTRACTOR, or (2) by any other person; and
21.1.5 Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.

21.2 Certificates of Insurance acceptable to the OWNER shall be filed with the OWNER prior to commencement of the WORK. These Certificates shall contain a provision that coverages afforded under the policies will not be canceled unless at least fifteen (15) days prior WRITTEN NOTICE has been given to the OWNER.

21.3 The CONTRACTOR shall procure and maintain, at his own expense, during the CONTRACT TIME, liability insurance as hereinafter specified;

21.3.1 CONTRACTOR'S General Public Liability and Property Damage Insurance including vehicle coverage issued to the CONTRACTOR and protecting him from all claims for personal injury, including death, and all claims for destruction of or damage to property, arising out of or in connection with any operations under the CONTRACT DOCUMENTS, whether such operations be by himself or by any SUBCONTRACTOR under him, or anyone directly or indirectly employed by the CONTRACTOR or by a SUBCONTRACTOR under him. Insurance shall be written with a limit of liability of not less than, $500,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident; and a limit of liability of not less than $500,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than $200,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than $200,000 aggregate for any such damage sustained by two or more persons in any one accident.

21.3.2 The CONTRACTOR shall acquire and maintain, if applicable, Fire and Extended Coverage insurance upon the PROJECT to the full insurable value thereof for the benefit of the OWNER, the CONTRACTOR, and SUBCONTRACTORS as their interest may appear. This provision shall in no way release the CONTRACTOR or CONTRACTOR'S surety from obligations under the CONTRACT DOCUMENTS to fully complete the PROJECT.

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

21.5 The CONTRACTOR shall secure, if applicable, “All Risk” type Builder's Risk Insurance for WORK to be performed. Unless specifically authorized by the OWNER, the amount of such insurance shall not be less than the CONTRACT PRICE totaled in the BID. The policy shall cover not less than the losses due to fire, explosion, hail, lightning, vandalism, malicious mischief, wind, collapse, riot, aircraft, and smoke during the CONTRACT TIME, and until the WORK is accepted by the OWNER. The policy shall name as the insured the CONTRACTOR, the ENGINEER, and the OWNER.

22. CONTRACT SECURITY

22.1 The CONTRACTOR shall within ten (10) days after the receipt of the NOTICE OF AWARD furnish the OWNER with a Performance Bond and a Payment Bond in penal sums equal to the amount of the CONTRACT PRICE, conditioned upon the performance by the CONTRACTOR of all undertakings, covenants, terms, conditions and agreements of the CONTRACT DOCUMENTS and upon the prompt payment by the CONTRACTOR to all persons supplying labor and materials in the prosecution of the WORK provided by the CONTRACT DOCUMENTS. Such BONDS shall be executed by the CONTRACTOR and a corporate bonding company licensed to transact such business in the state in which the WORK is to be performed and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these BONDS shall be borne by the CONTRACTOR. If at any time a surety on any such BOND is declared a bankrupt or loses its right to do business in the state in which the WORK is to be performed or is removed from the list of Surety Companies accepted on Federal BONDS, CONTRACTOR shall within ten (10) days after notice from the OWNER to do so, substitute an acceptable BOND (or BONDS) in such form and sum and signed by such other surety or sureties as may be satisfactory to the OWNER. The premiums on such BOND shall be paid by the CONTRACTOR. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable BOND to the OWNER.

23. ASSIGNMENTS

23.1 Neither the CONTRACTOR nor the OWNER shall sell, transfer, assign or otherwise dispose of the Contract or any portion thereof or of his right, title or interest therein, or his obligations thereunder, without written consent of the other party.

24. INDEMNIFICATION

24.1 The CONTRACTOR will indemnify and hold harmless the OWNER and the ENGINEER and their agents and employees from and against all claims, damages, losses and expenses including attorney's fees arising out of or resulting from the performance of the WORK provided that any such claims, damage, loss or expense is attributable to bodily injury sickness, disease or death. or to injury to or destruction of tangible property including the loss of use resulting therefrom; and is caused in whole or in part by any negligent or willful act or omission of the CONTRACTOR, and SUBCONTRACTOR, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

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

24.3 The obligation of the CONTRACTOR under this paragraph shall not extend to the liability of the ENGINEER, his agents or employees arising out of the preparation or approval of maps, DRAWINGS, opinions, reports, surveys, CHANGE ORDERS, designs or SPECIFICATIONS.
25. SEPARATE CONTRACTS

25.1 The OWNER reserves the right to let other contracts in connection with this PROJECT. The CONTRACTOR shall afford other CONTRACTORS reasonable opportunity for the introduction and storage of their materials and the execution of their WORK, and shall properly connect and coordinate his WORK with theirs. If the proper execution or results of any part of the CONTRACTOR'S WORK depends upon the WORK of any other CONTRACTOR, the CONTRACTOR shall inspect and promptly report to the ENGINEER any defects in such WORK that render it unsuitable for such proper execution and results.

25.2 The OWNER may perform additional WORK related to the PROJECT by himself, or he may let other contracts containing provisions similar to these. The CONTRACTOR will afford the other CONTRACTORS who are parties to such Contracts (or the OWNER, if he is performing the additional WORK himself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of WORK, and shall properly connect and coordinate his WORK with theirs.

25.3 If the performance of additional WORK by other CONTRACTORS or the OWNER is not noted in the CONTRACT DOCUMENTS prior to the execution of the CONTRACT, written notice thereof shall be given to the CONTRACTOR prior to starting any such additional WORK. If the CONTRACTOR believes that the performance of such additional WORK by the OWNER or others involves him in additional expense or entitles him to an extension of the CONTRACT TIME, he may make a claim therefor as provided in Sections 14 and 15.

26. SUBCONTRACTING

26.1 The CONTRACTOR may utilize the services of specialty SUBCONTRACTORS on those parts of the WORK which, under normal contracting practices, are performed by specialty SUBCONTRACTORS.

26.2 The CONTRACTOR shall not award WORK to SUBCONTRACTOR(s), in excess of fifty (50%) percent of the CONTRACT PRICE, without prior written approval of the OWNER.

26.3 The CONTRACTOR shall be fully responsible to the OWNER for the acts and omissions of his SUBCONTRACTORS, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

26.4 The CONTRACTOR shall cause appropriate provisions to be inserted in all subcontracts relative to the WORK to bind SUBCONTRACTORS to the CONTRACTOR by the terms of the CONTRACT DOCUMENTS insofar as applicable to the WORK of SUBCONTRACTORS and to give the CONTRACTOR the same power as regards terminating any subcontract that the OWNER may exercise over the CONTRACTOR under any provision of the CONTRACT DOCUMENTS.

26.5 Nothing contained in this CONTRACT shall create any contractual relation between any SUBCONTRACTOR and the OWNER.

27. ENGINEER'S AUTHORITY

27.1 The ENGINEER shall act as the OWNER'S representative during the construction period. He shall decide questions which may arise as to quality and acceptability of materials furnished and WORK performed. He shall interpret the intent of the CONTRACT DOCUMENTS in a fair and unbiased manner. The ENGINEER will make visits to the site and determine if the WORK is proceeding in accordance with the CONTRACT DOCUMENTS.

27.2 The CONTRACTOR will be held strictly to the intent of the CONTRACT DOCUMENTS in regard to the quality of materials, workmanship and execution of the WORK. Inspections may be made at the factory or fabrication plant of the source of material supply.
27.3 The ENGINEER will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.

27.4 The ENGINEER shall promptly make decisions relative to interpretation of the CONTRACT DOCUMENTS.

28. LAND AND RIGHTS-OF-WAY

28.1 Prior to issuance of NOTICE TO PROCEED, the OWNER shall obtain all land and rights-of-way necessary for carrying out and for the completion of the WORK to be performed pursuant to the CONTRACT DOCUMENTS unless otherwise mutually agreed.

28.2 The OWNER shall provide to the CONTRACTOR information which delineates and describes the lands owned and rights-of-way acquired.

28.3 The CONTRACTOR shall provide at his own expense and without liability to the OWNER any additional land and access thereto that the CONTRACTOR may desire for temporary construction facilities, or for storage of materials.

29. GUARANTY

29.1 The CONTRACTOR shall guarantee all materials and equipment furnished and WORK performed for a period of one (1) year from the date of SUBSTANTIAL COMPLETION. The CONTRACTOR warrants and guarantees for a period of one (1) year from the date of SUBSTANTIAL COMPLETION of the system that the completed system is free from all defects due to faulty materials or workmanship and the CONTRACTOR shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the system resulting from such defects. The OWNER will give notice of observed defects with reasonable promptness. In the event that the CONTRACTOR should fail to make such repairs, adjustments, or other WORK that may be made necessary by such defects, the OWNER may do so and charge the CONTRACTOR the cost thereby incurred. The Performance BOND shall remain in full force and effect through the guarantee period.

30. ARBITRATION

30.1 All claims, disputes and other matters in question arising out of, or relating to, the CONTRACT DOCUMENTS or the breach thereof, except for claims which have been waived by the making and acceptance of final payment as provided by Section 20, shall be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association. This agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in any court having jurisdiction thereof.

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

30.3 The CONTRACTOR will carry on the WORK and maintain the progress schedule during any arbitration proceedings, unless otherwise mutually agreed in writing.

31. TAXES

31.1 The CONTRACTOR will pay all sales, consumer, use and other similar taxes required by the law of the place where the WORK is performed.
1. **INSURANCE**

1.1 The Contractor shall provide umbrella form general liability coverage with a limit of liability of not less than $1,000,000 which applies to general and automobile liability coverage.

2. **PROTECTION OF OWNER**

2.1 The Contractor hereby agrees to hold harmless, indemnify and defend the Owner, the Owner's agent, the Consulting Engineer, and the Owner's employees while acting within the scope of their duties from and against any and all liability, claims, damages, and cost of defense arising out of the Contractor's performance of the work described herein but not including the sole negligence of the Owner, his agents or employees. The Contractor will require any and all subcontractors to conform with the provisions of this clause prior to commencing any work. The Contractor shall furnish an Owner's Protective Liability Policy which lists both the Owner and the Engineer as Named Insured. This insurance coverage shall be provided in a policy separate from the Contractor's insurance policies, and a copy of the policy shall be provided to the Engineer. The limits of liability shall be not less than $1,000,000.

3. **ADVERTISEMENT OF CLOSING**

3.1 The Contractor shall attach to the final payment estimate an affidavit of publication (with clipping) from a newspaper of general circulation in the county where work was done, that completion has been advertised weekly for four consecutive weeks. First notice must be subsequent to completion. Employ the following copy:

“Notice is hereby given that (contractor and address) has completed all work on the WASTEWATER TREATMENT PLANT RENOVATION, in Geneva, Alabama." All persons having any claim for labor, materials, or otherwise in connection with this project should immediately notify the above named contractor and the Manager of the Water Works and Sewer Board of the City of Geneva.

4. **SUBCONTRACTING**

4.1 The Contractor shall not award work to subcontractor(s) in excess of fifty (50%) percent of the contract price, without prior written approval of the Owner.

5. **TIME FOR COMPLETION AND LIQUIDATED DAMAGES**

ARTICLE 15 of the GENERAL CONDITIONS is hereby revised to read as follows:

5.1 It is hereby understood and mutually agreed, by and between the Contractor and the Owner, that the date of beginning and the time for completion as specified in the contract of the work to be done hereunder are ESSENTIAL CONDITIONS of this Contract; and it is further mutually understood and agreed that the work embraced in this Contract shall be commenced on a date to be specified in the “Notice to Proceed.”
5.2 The Contractor agrees that said work shall be prosecuted regularly, diligently and uninterrupted at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the Owner, that the time for the completion of the work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

5.3 If the said Contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor does hereby agree, as a part consideration for the awarding of this Contract, to pay to the Owner the amount specified in the Contract, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the Contract for completing the work.

5.4 The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, and said amount is agreed to be the amount of damages which the Owner would sustain and said amount shall be retained from time to time by the Owner from current periodical estimates.

5.5 It is further agreed that time is of the essence of each and every portion of this Contract and the specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the Contract an additional time is allowed for the completion of any work, the new time limit fixed by such extension shall be of the essence of this Contract. Provided, that the Contractor shall not be charged with liquidated damages or any excess cost when the Owner determines that the Contractor is without fault and the Contractor’s reasons for the time extension are acceptable to the Owner; provided, further, that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:

5.5.1 To any preference, priority or allocation order duly issued by the Government.

5.5.2 To unforeseeable cause beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes and severe weather.

5.5.3 To any delays of Subcontractors or suppliers occasioned by any of the causes specified in subsections (a) and (b) of this article.

5.6 Provided, further, that the Contractor shall, within ten (10) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the Contract, notify the Owner, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the contractor within a reasonable time of its decision in the matter.
6. **PAYMENTS TO CONTRACTOR**

Portions of ARTICLE 19 of the GENERAL CONDITIONS are revised to read as follows:

6.1 The OWNER shall retain five (5) percent of the amount of each payment until the project is fifty (50) percent complete after which no further retainage shall be withheld. The retainage stated above shall be held by the OWNER until final completion and acceptance of the work, and meet all conditions of the Contract.

6.2 Prior to final payment, a NONRESIDENT CONTRACTOR shall satisfy the OWNER that he or she has paid all taxes due and payable to the State of Alabama or any political subdivision thereof. For the purpose of this Article, a NONRESIDENT CONTRACTOR is one who is neither (a) organized and existing under the laws of the State of Alabama, nor (b) maintains its principal place of business in the State of Alabama. A NONRESIDENT CONTRACTOR which has maintained a permanent branch office within the State of Alabama for at least five continuous years shall no thereafter be deemed to be NONRESIDENT CONTRACTOR so long as the Contractor continues to maintain a branch office within Alabama.

6.3 Final Payment shall be made to the Contractor no less than 10 days following receipt by the Owner of:

1. A properly executed and duly certified payment estimate.
2. A release of all claims filed against the Contractor, or claims of lien filed against the Owner, arising under or by virtue of the Contract or completed work.
3. A proof of advertisement of project completion. However the final payment shall not be made until the expiration of thirty days after completion of the advertisement.
4. For NONRESIDENT CONTRACTORS, proof of payment of all taxes due the State of Alabama, or any political subdivision thereof.

6.4 Only those portions of ARTICLE 19 of the GENERAL CONDITIONS which conflict with the Articles above are revised. All other portions of Article 19 shall remain as stated in the GENERAL CONDITIONS.

7. **CONTRACT SECURITY**

7.1 ARTICLE 22 of the GENERAL CONDITIONS of the Contract are revised such that the amount of the PAYMENT BOND will not exceed 50% of the Contract Price.

8. **ASSIGNMENT**

8.1 ARTICLE 23 of the GENERAL CONDITIONS is hereby revised to include the following:

Under no circumstances shall a contract be assigned to an unsuccessful bidder whose bid was rejected because he or she was not a responsive bidder.
9. **DOMESTIC PRODUCTS AND STEEL**

9.1 The Contractor to whom the Construction Contract is awarded shall use materials, supplies, and products manufactured, mined, processed, or otherwise produced in the United States or its territories, if the same are available at reasonable and competitive prices, and are not contrary to any sole source specification included in the Contract.

9.2 The Contractor shall use steel produced within the United State when the specifications require the use of steel, and do not limit its supply to a sole source.

9.3 The Contractor shall use type "K" copper tubing produced within the United States when the Specifications require the use of copper tubing, and do not limit its supply to a sole source.

9.4 The Contractor shall provide the Owner a certification that only domestic products and steel will be used in the completion of the work subsequent to the contract. The Certification shall be provided prior to the execution of the contract, and shall be executed by the same person who executes the Contract on behalf of the Contractor, and shall be notarized. The Contractor shall also provide copies of similar certifications from material and equipment suppliers as a part of any submittals presented to the Engineer for approval.

9.5 In the event the Contractor violates the agreement to use domestic or steel, and domestic products or steel are not used, there shall be a downward adjustment in the contract price equal to any realized savings or benefits to the Contractor.

10. **COMPLIANCE WITH PL 91-596 AND PL 91-54**

10.1 The Contractor shall comply with the Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596) and under section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54).
1. **GENERAL**

1.1 The work to be performed under this contract shall consist of the renovation of the existing wastewater treatment plant. This treatment plant is a circular above ground steel package plant which was supplied by Clow. It was constructed about 1973. The treatment facility was previously renovated in 1991.

1.2 The treatment facility must remain in continuous operation during all phases of the renovation. A planned sequence of operations must be prepared which will allow sections of the facility to be removed from service, while the remaining sections stay in operation to provide treatment for the wastewater.

2. **MAJOR ITEMS OF WORK**

2.1 The major items of work to be included in this contract are as follows:

1. Drain all sections of the treatment facility in a planned sequence.
2. Removal of sand and debris from all sections of the treatment plant.
3. Replace the clarifier internals and drive mechanism.
4. Replace the influent box and bar screen.
5. Remove the influent trough including support stands.
6. Replace return sludge airlift assembly and sludge box.
7. Install a new waste sludge airlift assembly.
8. Install a new walkway to access the flow measurement system and effluent sampler.
9. Install toe plates on the existing peripheral walkway.
10. Install a truss handrail system on the existing clarifier bridge.
11. Replace existing walkway from clarifier wall to exterior wall.
12. Modify and strengthen existing clarifier bridge support.
13. Replace diffuser drop pipe supports.
15. Repair and replace deteriorated sections of existing walls and bulkheads.
16. Replace v-notch weir.
17. Install new chlorination diffuser system.
18. Install temporary aeration basin bypass piping.
19. Install temporary 12” chlorine contact basin bypass piping.
20. Install temporary chlorine contact tank and connection to effluent structure.
21. Remove froth spray system and other items not in service.
22. Sandblast and recoat the entire facility including stairs.
3. **SEQUENCE OF CONSTRUCTION ACTIVITIES**

3.1 In order to insure that the treatment facility provides proper treatment to the City’s wastewater, the construction activities must be properly planned and conducted in the proper sequence.

3.2 Prior to beginning any work on the treatment facility, the Contractor shall meet with the Owner and the Engineer to develop a final written work schedule and sequence. This work schedule shall include the time required for each activity and estimated dates to begin and end each activity. The work schedule shall be updated at least weekly by the Contractor.

4. **CLARIFIER**

4.1 The clarifier sludge removal and scum skimmer equipment shall be completely replaced with new equipment. The torque tube below the top drive flange shall also be replaced, as well as the sludge scraper braces and supports. The centering pin located in the base of the clarifier shall also be replaced.

4.2 The new equipment shall be essentially identical to the existing equipment, and shall be completely compatible with the existing clarifier structural system.

4.3 The clarifier equipment to be provided shall consist of the following primary items:

1. 6” schedule 40 steel pipe torque shaft with flanged connection for drive.
2. Carbon steel torque shaft guide pin located in center of existing sludge sump in bottom of clarifier tank.
3. 7’ diameter x 48” deep stilling well, carbon steel construction.
4. Full diameter skimmer arm assembly fabricated from structural carbon steel w/PVC belting blades.
5. Full radius stainless steel scum trough assembly with a 4” schedule 40 stainless steel pipe air lift for discharge to digester.
6. Scaper arm assembly fabricated from structural steel w/PVC belting blades.
7. 14” schedule 10 carbon steel clarifier influent pipe.
8. 1/8” thick 304SS adjustable v-notch weir plates with seal tape and 304SS hardware.
9. ¼” thick carbon steel scum baffle assembly with carbon steel angle brackets.
4.4 A new clarifier drive mechanism shall be provided and installed. The new clarifier drive mechanism shall be designed to provide a maximum running torque and alarm torque of 5,460 ft. lbs. The cutoff torque shall be 6,067 ft. lbs. The drive mechanism’s output RPM shall be 0.019. The gear drive will be a triple reduction unit consisting of a combination of a planetary gear and a fixed internal sun gear. The unit shall be equipped with two torque switches, one to energize an alarm on overload and a second switch to shut down the motor. The unit shall be equipped with a 0-100% torque indicator. A ½ horsepower, 230/460 volt, 3 phase 60 cycle motor shall power the Clarifier drive reducer. Existing power supply will be reused.

4.5 The clarifier equipment shall be shop coated in accordance with the Painting Specifications.

5. **OTHER ITEMS OF WORK**

5.1 A new 304 SS influent box assembly with manual bar screen and 16” flanged connection shall be provided and installed. The new influent box and bar screen shall be equivalent to the existing box and screen in size and operation.

5.2 The existing influent trough assembly and supports for step aeration shall be removed.

5.3 A new 10” diameter 304 stainless steel return activated sludge airlift assembly with sludge box shall be provided and installed. The sludge box is to be constructed of 3/16”, 304 stainless steel, and the box shall be provided with a bolt on the cover and measuring box. The airlift assembly and sludge box shall be essentially equivalent to the existing airlift assembly and box.

5.4 A new 4” diameter 304 stainless steel waste activated sludge airlift assembly shall be provided and installed. Piping, fittings, and a valve shall be provided such that sludge can be wasted to the existing primary digester. The airlift assembly shall be essentially equivalent to the existing airlift assembly.

5.5 A new 24” wide walkway shall be provided and installed to access the existing flow sensor and sampler. The walkway will consist of two-rail 1½” square tubing handrails on both sides with 4”X1/4” steel toe plates and 1” aluminum I-bar grating designed for a minimum live load of 75 PSF.

5.6 The existing peripheral walkway shall be provided with 4” X ¼” carbon steel toe plates. The existing tread plate and steel handrails will be blasted and painted.

5.7 A new carbon steel truss handrail system shall be provided and installed on the existing clarifier bridge. New steel tread plate shall be installed as required.
5.8 A new 3’ wide walkway shall be provided and installed from the clarifier wall to the outer tank wall to replace the existing deteriorated walkway. The walkway shall be constructed with two-rail 1½” square steel tubing handrails provided on both sides of the walkway with 4” x ¼” steel toe plate and 1” aluminum I-bar grating designed for a minimum live load of 75 PSF.

5.9 New carbon steel support / stiffener gussets shall be provided and installed in the existing W16 clarifier bridge beam. The new gusset plates shall be ½” steel plate.

5.10 New carbon steel structural supports shall be provided and installed for the existing diffuser drop pipes. The new diffuser drop pipe supports shall be mounted on the concrete slab near the clarifier wall. Stainless steel anchors and hardware shall be provided.

5.11 A new 4” diameter schedule 40 aluminum supernatant decant airlift assembly shall be provided and installed. A winch unit and swing arm shall be provided to allow a 2.5 foot drawdown in the digester. Additional piping and fittings shall be provided such that the unit can discharge back to the head of the treatment facility.

5.12 There are two large sections of the bulkheads dividing the aeration section of the facility from the digesters which are deteriorated. The top eight feet of these bulkheads is to be replaced. The new section of the bulkhead is to be equivalent in construction to the existing bulkheads. Payment for providing and installing the steel plate shall be on a unit price basis.

5.13 There are deteriorated sections of the existing clarifier wall section above the weir trough. The deteriorated wall sections are to be repaired with new ¼” steel plate. Payment for providing and installing the steel plate shall be on a unit price basis.

5.14 There are deteriorated sections of the existing outer wall which are severely pitted. These deteriorated wall sections are to be repaired with new ¼” steel plate. Payment for providing and installing the steel plate shall be on a unit price basis.

5.15 There are sections of the existing air header which are deteriorated. These deteriorated sections of tubing are to be replaced with new 12”x8” tubing. Payment for providing and installing the steel tubing shall be on a unit price basis.

5.16 There are sections of the existing 3”x4” tubing which are deteriorated. These deteriorated sections of tubing are to be replaced with new 3”x4” tubing. Payment for providing and installing the steel tubing shall be on a unit price basis.
5.17 The existing effluent weir is to be replaced with a new 304 stainless steel v-notch weir. The new weir plate shall be 58” wide by 45” wide with a 27” deep “V”.

5.18 A new chlorine diffuser shall be supplied and installed. The diffuser shall be constructed with 12” diameter schedule 20 steel pipe and a length of 18”. The diffuser shall be mounted with stainless steel hardware.

5.19 In order to perform the work on the aeration basin, it will be necessary to install temporary bypass piping from the influent structure to the digestors. Payment for installing and removing this piping shall be on a lump sum basis.

5.20 In order to perform the work on the chlorine contact basin, it will be necessary to install temporary 12” bypass piping from the clarifier effluent to the exterior of the tank. Payment for installing and removing this piping shall be on a lump sum basis.

5.21 During this time while chlorine contact basin is out of service it will be necessary to provide a temporary chlorine contact tank. The Owner has a 10,000 gallon hydropnematic tank which is available for use by the contractor. This tank shall be modified as required for use as a chlorine contact tank and piping shall be installed as necessary to connect to the existing effluent piping. Payment for all work shall be on a lump sum price basis.

5.22 The following equipment is to be reused in place:
   a) Existing air header
   b) Existing drop pipe diffuser assemblies including valves
   c) Existing drain valves

5.23 The existing froth spray system is to be removed.

5.24 The entire treatment facility (interior and exterior) is to be completely sandblasted and recoated in accordance with the attached Surface Preparation and Coating System Specifications.

6. DEBRIS REMOVAL

6.1 The wastewater treatment system has a significant accumulation of sand, grit, and miscellaneous debris in the aeration tanks. It is estimated that the material has an average depth of 2’- 6”. It is estimated that there should be no significant accumulation of material in the clarifier.

6.2 As a part of the renovation of the treatment facility, all accumulations of material shall be removed from the aeration basins and digester. The material shall be placed by the Contractor on the treatment facility site as directed by the Owner.
6.3 In the event that the quantity of material to be removed from the treatment facility varies significantly from the estimated depth, the payment for the material removal will be adjusted upward or downward on the basis of the unit price bid in the Proposal.

7. **PLANT OPERATION**

7.1 The Owner will be responsible for the day to day operation of the facility.

7.2 The Contractor will be responsible for furnishing, installing, and operating all necessary equipment, piping, pumps, valves, etc. necessary to bypass sections of the treatment facility in order to complete the renovation work.

7.3 During the rehabilitation work it will be necessary to remove sludge from the digestors and to waste sludge produced by the treatment facility while the work is ongoing. Some of the sludge may be wasted to the sludge drying beds. Any remaining sludge must be pumped into tanker trucks for disposal. The Owner will be responsible for payment of the costs of providing the tanker trucks and disposal of the sludge.

8. **EQUIPMENT SUPPLIER**

8.1 The equipment required to rehabilitate the wastewater treatment facility shall be as manufactured by Evoqua Water Technologies LLC, Thomasville, GA, or approved equal.

8.2 The plant components shall be prefabricated in the factory of the manufacturer and shall be shipped in assemblies complete and operable as detailed on the drawings and specified herein. Each component assembly shall be erected in the field in accordance with the manufacturer's installation drawings. The manufacturer shall provide for one visit to the manufacturing shop by the Owner and the Engineer to inspect manufactured components as they are being manufactured.

8.3 The field installation shall be performed by the equipment manufacturer's personnel, directly employed by the equipment manufacturer and normally engaged in the field installation of the equipment specified herein. The Field Installation Foreman shall have a minimum of 10 years of experience installing this type of equipment for wastewater treatment.
9. PRE-BID SUBMITTAL REQUIREMENTS

9.1 The equipment required to upgrade the treatment facility shall include as a minimum the components described in following pages of these specifications. Interested equipment suppliers manufacturers may submit, provided the conditions of the following “Qualifications” are met.

9.2 A manufacturer is allowed to submit a bid on their system, provided the system has been pre-approved as an equal by the ENGINEER. It is the ENGINEER’S sole discretion if the system proposed, and submitted upon, is an equal to the system specified.

9.3 Submittal of partial segments of the required equipment will not be acceptable. The manufacturer must submit a minimum of two (2) sets of data on the complete system, including as a minimum all the specified equipment, and is to include design calculations of the process proposed, qualification information showing references of similar experiences as a system’s supplier (minimum 10 installations), references of installations using the proposed process. Installations shown must be treatment facilities installed by the manufacturer for the installation to be acceptable as a reference. Installations installed by someone other than the manufacturer shall not be acceptable as a reference.

9.4 All documents supporting an “or equal” evaluation shall be submitted to the ENGINEER no later than 14 days prior to the bid date.

9.5 Each set of data shall include but not necessarily be limited to:

a) Drawings showing dimensions and details of all steel units and minimum recommended spacing.

b) Installation list of similar installations.

c) All other information necessary to enable the Engineer to determine whether the proposed equipment meets the specified requirements.

d) Resume for key individuals including but not limited to, Project Manager, Process Design Engineer, Manufacturing Shop Foreman, Field Installation Foreman, and Field Service Technician.

e) Provide a complete description of the operational requirements and timeline of the construction process in order to maintain a proper operating treatment plant throughout the construction schedule.

9.6 Regardless of the outcome of the review, the manufacturer requesting the “or equal” consideration shall be responsible for the cost of the ENGINEER’S evaluation. A cashier’s check in the amount of $5,000.00 is to accompany the pre-submittal package. If the costs are less, a refund will be allowed to the manufacturer, any increase in cost is to be paid in full by the manufacturer prior to being accepted as an “or equal”.

46
10. CONCLUSION

10.1 These Specifications, together with the Plans, are intended to describe and provide the Owner with a complete renovation of the existing wastewater treatment plant for the price bid. Thus, this price shall include all minor items, such as unions, vent pipes, and other accessories which are not specified in detail, but which would normally be provided for a complete installation.

10.2 The preceding paragraph is intended to cover minor items. Any bidder, equipment manufacturer, or supplier who should discover a major discrepancy or omission in the Plans or Specifications is requested to provide this information to the Engineer prior to the bid date so that an Addendum can be issued.

10.3 All work to be performed under this Contract shall be coordinated with the treatment plant operating personnel. The work shall be completed as soon as possible; however, no work shall be initiated until all materials and equipment required to complete the job have been delivered or are available for use.
SPECIFICATIONS FOR STRUCTURAL STEEL

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes structural steel and grout.

1.2 PERFORMANCE REQUIREMENTS

A. Connections: Provide details of simple shear connections required by the Contract Documents comply with other information and restrictions indicated.

1.  Select and complete connections using schematic details indicated.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication of structural-steel components.

C. Welding certificates.

D. Mill test reports.

E. Source quality-control test reports.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator who participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category Sbd.

B. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel."

C. Comply with applicable provisions of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

D. Preinstallation Conference: Conduct conference at Project site.
PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS
   A. W-Shapes: ASTM A 992/A 992M.
   B. Channels, Angles-Shapes: ASTM A 36/A 36M.
   C. Plate and Bar: ASTM A 36/A 36M.
   D. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
   E. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS
   A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers.
      2. Direct-Tension Indicators: ASTM F 959, Type 325 (ASTM F 959M, Type 8.8,) compressible-washer type.
   B. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1, Type B.
   C. Headed Anchor Rods: ASTM F 1554, Grade 36, straight.
   D. Threaded Rods: ASTM A 193/A 193M.

2.3 PRIMER
   A. Prime in accordance with the Specifications for Surface Preparation and Coating Systems.

2.4 GROUT
   A. Metallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, metallic aggregate grout, mixed with water to consistency suitable for application and a 30-minute working time.
B. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION
A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges".

2.6 SHOP CONNECTIONS
A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
   1. Joint Type: Pretensioned.
B. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.

2.7 SHOP PRIMING
A. Shop prime steel surfaces except the following:
   1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
   2. Surfaces to be field welded.
   3. Surfaces to be high-strength bolted with slip-critical connections.
   4. Surfaces to receive sprayed fire-resistive materials.
   5. Galvanized surfaces.
B. Surface Preparation: Prepare in accordance with the Specifications for Surface Preparation and Coating Systems.
C. Priming: Prime the steel in accordance with the Specifications for Surface Preparation and Coating Systems.

2.8 SOURCE QUALITY CONTROL
A. Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports. Comply with testing and inspection requirements of Part 3, Article "Field Quality Control."
B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
C. In addition to visual inspection, shop-welded shear connectors will be tested and inspected according to requirements in AWS D1.1 for stud welding.
PART 3 - EXECUTION

3.1 ERECTION

A. Examination: Verify elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments, with steel erector present, for compliance with requirements.
   1. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Set structural steel accurately in locations and to elevations indicated and according to AISC's "Code of Standard Practice for Steel Buildings and Bridges."

   1. Set base plates for structural members on wedges, shims, or setting nuts as required.
   2. Weld plate washers to top of base plate.
   3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of base plate before packing with grout.
   4. Promptly pack grout solidly between bearing surfaces and base plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

D. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.2 FIELD CONNECTIONS

A. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.

3.3 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.

B. Bolted Connections: Shop-bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

C. Welded Connections: Field welds will be visually inspected according to AWS D1.1.
1. In addition to visual inspection, field welds will be tested according to AWS D1.1 and the following inspection procedures, at testing agency's option:
   
a. Liquid Penetrant Inspection: ASTM E 165.
   b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
   c. Ultrasonic Inspection: ASTM E 164.
   d. Radiographic Inspection: ASTM E 94.

D. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
SPECIFICATIONS FOR ALUMINUM PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Aluminum pipe and tube handrails and railing systems.

B. Related Sections: Requirements relating to this Section are contained in the following Sections:

1. Division 5 Section "Pre-Engineered Aluminum Stairs and Railings" for aluminum pipe handrails and railing systems included with metal stairs.

1.3 DEFINITIONS

A. Definitions in ASTM E 985 for railing-related terms apply to this Section.

1.4 PERFORMANCE REQUIREMENTS

A. General: In engineering handrail and railing systems to withstand structural loads indicated, determine allowable design working stresses of materials based on the following:


B. Structural Performance of Handrails and Railing Systems: Engineer, fabricate, and install handrails and railing systems to withstand the following structural loads without exceeding the allowable design working stress of the materials for handrails, railing systems, anchors, and connections. Apply each load to produce the maximum stress in each of the respective components comprising handrails and railing systems.

1. Top Rail of Guardrail Systems: Capable of withstanding the following loads applied as indicated:
a. Concentrated load of 200 lbf applied at any point and in any direction.
b. Uniform load of 50 lbf per linear foot applied horizontally and concurrently with uniform load of 100 lbf per linear foot applied vertically downward.
c. Concentrated and uniform loads above need not be assumed to act concurrently.

2. Handrails Not Serving as Top Rails: Capable of withstanding the following loads applied as indicated:
   a. Concentrated load of 200 lbf applied at any point and in any direction.
   b. Uniform load of 50 lbf per linear foot applied in any direction.
   c. Concentrated and uniform loads above need not be assumed to act concurrently.

3. Infill Area of Guardrail Systems: Capable of withstanding a horizontal concentrated load of 200 lbf applied to 1 sq. ft. at any point in the system including panels, intermediate rails, balusters, or other elements composing the infill area.
   a. Above load need not be assumed to act concurrently with loads on top rails of railing systems in determining stress on guard.

C. Thermal Movements: Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in engineering, fabricating, and installing handrails and railing systems to prevent buckling, opening of joints, overstressing of components and connections, and other detrimental effects. Base engineering calculation on actual surface temperatures of materials due to both solar heat gain and nighttime sky heat loss.
   1. Temperature Change (Range): 120 deg F ambient 180 deg F material surfaces.

D. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.5 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product data for mechanically connected handrails and railing systems, each kind of fitting, grout, anchoring cement, and paint products.

C. Shop drawings showing fabrication and installation of handrails and railing systems including plans, elevations, sections, details of components, and attachments to other units of Work.
1. For installed handrails and railing systems indicated to comply with certain design loadings, include structural analysis data sealed and signed by the qualified professional engineer who was responsible for their preparation. Include all connection and anchorage design calculations.

D. Samples for verification of each type of exposed finish required, prepared on components indicated below that are of the same thickness and metal indicated for final unit of Work. Where finishes involve normal color and texture variations, include sample sets showing the full range of variations expected.

1. 6-inch-long sections of each distinctly different linear railing member including handrails, top rails, posts, and balusters.
2. Fittings and brackets.
3. Assembled sample of railing system, made from full-size components, including top rail, post, handrail, and infill. Show method of finishing members at intersections. Sample need not be full height.

E. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include a list of completed projects with project names, addresses, names of architects and owners, and other information specified.

F. Product test reports from a qualified independent testing agency evidencing compliance of handrails and railing systems with requirements based on comprehensive testing of current products.

G. Test reports from an independent testing agency evidencing compliance of handrails and railing systems with ASTM E 985.

1.6 QUALITY ASSURANCE

A. Single-Source Responsibility: Obtain handrails and railing systems of each type and material from a single manufacturer.

B. Engineer Qualifications: Professional engineer legally authorized to practice in the jurisdiction where Project is located and experienced in providing engineering services of the kind indicated for handrails and railing systems similar to this Project in material, design, and extent, and that have a record of successful in-service performance.

1.7 STORAGE

A. Store handrails and railing systems inside a well-ventilated area, away from uncured concrete and masonry and protected from weather, moisture, soiling, abrasion, extreme temperatures, and humidity.
1.8 PROJECT CONDITIONS

A. Field Measurements: Where handrails and railing systems are indicated to fit to other construction, check actual dimensions of other construction by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabricating handrails and railing systems without field measurements. Coordinate other construction to ensure that actual dimensions correspond to guaranteed dimensions.

1.9 SEQUENCING AND SCHEDULING

A. Sequence and coordinate installation of wall handrails as follows:

1. Mount handrails only on completed walls. Do not support handrails temporarily by any means not satisfying structural performance requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering handrails and railing systems that may be incorporated in the Work include, but are not limited to, the following:

1. Aluminum Pipe and Tube Railings:
   a. Aluminum Tube Railings, Inc.
   b. Blum: Julius Blum & Co., Inc.
   c. Moultrie Manufacturing Co.
   d. Superior Aluminum Products, Inc.
   e. Thompson Fabricating Company.
   f. Wagner: R & B Wagner, Inc.

2.2 METALS

A. General: Provide metals free from surface blemishes where exposed to view in the finished unit. Exposed-to-view surfaces exhibiting pitting, seam marks, roller marks, stains, discolorations, or other imperfections on finished units are not acceptable.
B. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of the alloy and temper designated below for each aluminum form required:

C. Brackets, Flanges, and Anchors: Cast or formed metal of the same material and finish as supported rails, unless otherwise indicated.

2.3 WELDING MATERIALS, FASTENERS, AND ANCHORS

A. Welding Electrodes and Filler Metal: Provide type and alloy of filler metal and electrodes as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of the type, grade, and class required to produce connections that are suitable for anchoring railings to other types of construction indicated and capable of withstanding design loadings.

   1. For aluminum railings, provide fasteners fabricated from type 304 or type 316 stainless steel.

C. Fasteners for Interconnecting Railing Components: Use fasteners of same basic metal as the fastened metal, unless otherwise indicated. Do not use metals that are corrosive or incompatible with materials joined.

   1. Provide concealed fasteners for interconnecting railing components and their attachment to other work, except where exposed fasteners are unavoidable or are the standard fastening method for handrail and railing system indicated.

D. Cast-in-Place and Post-installed Anchors: Anchors of type indicated below, fabricated from stainless-steel materials, capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and equal to 4 times the load imposed when installed in concrete, as determined by testing per ASTM E 488, conducted by a qualified, independent testing agency.

   2. Chemical anchors.
   3. Expansion anchors.
   4. Undercut anchors.

2.4 GROUT AND ANCHORING CEMENT

A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
B. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without need for protection by a sealer or waterproof coating and is recommended for exterior use by manufacturer.

C. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:

1. Nonshrink, Nonmetallic Grouts:
   a. B-6 Construction Grout; W.R. Bonsal Co.
   b. Diamond-Crete Grout; Concrete Service Materials Co.
   c. Sure-grip High Performance Grout; Dayton Superior Corp.
   d. Euco N-S Grout; Euclid Chemical Co.
   e. Five Star Grout; Five Star Products.
   f. Vibropruf #11; Lambert Corp.
   g. Masterflow 928 and 713; Master Builders Technologies, Inc.
   h. Sealtight 588 Grout; W.R. Meadows, Inc.
   i. Sonogrout 14; Sonneborn Building Products--ChemRex, Inc.

2. Interior Anchoring Cement:
   a. Ankertite Cement; Dayton Superior Corp.
   b. Por-Rok; Minwax Construction Products Division.

3. Erosion-Resistant Anchoring Cement:
   a. Bonsal Anchor Cement; W.R. Bonsal Co.
   b. Super Por-Rok; Minwax Construction Products Division.
   c. Thorogrip; Thoro Systems Products.

2.5 FABRICATION

A. General: Railings shall be 1 1/2" Schedule 40 aluminum pipe alloy 6105-T5, ASTM-B-429 or ASTM-B-221. Post shall be 1 1/2" Schedule 80 aluminum pipe of the same alloy. Post spacing shall be a maximum of 6'-0". Fabricate handrails and railing systems to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of hollow members, post spacings, and anchorage, but not less than those required to support structural loads.

B. Assemble handrails and railing systems in the shop to the greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
C. Form changes in direction of members as follows:
   1. As detailed.
   2. By any method indicated above, applicable to change of direction involved.

D. Form simple and compound curves by bending pipe in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of pipe throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of pipe.

E. Welded Connections: Fabricate handrails and railing systems for connection of members by welding. For connections made during fabrication, weld corners and seams continuously to comply with the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At tee and cross intersections, cope ends of intersecting members to fit contour of pipe or tube to which end is joined, and weld all around.
   5. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

F. Non-welded Connections: Fabricate handrails and railing systems by connecting members with railing manufacturer's standard concealed mechanical fasteners and fittings, unless otherwise indicated. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
   1. Fabricate splice joints for field connection using epoxy structural adhesive where this represents manufacturer's standard splicing method.

G. Welded Connections for Aluminum Pipe: Fabricate pipe handrails and railing systems by connecting members with concealed internal welds, which eliminate surface grinding, using manufacturer's standard system of sleeve and socket fittings.

H. Brackets, Flanges, Fittings, and Anchors: Provide manufacturer's standard wall brackets, flanges, miscellaneous fittings, and anchors to interconnect handrail and railing system members to other construction.

I. Provide inserts and other anchorage devices to connect handrails and railing systems to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by handrails and railing systems. Coordinate anchorage devices with supporting structure.

J. For railing posts set in concrete, provide preset sleeves of stainless-steel, not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, and steel plate forming bottom closure.
K. For removable railing posts, fabricate slip-fit sockets from stainless-steel pipe whose inside diameter is sized for a close fit with posts and to limit deflection of post without lateral load, measured at top, to not more than 1/12 of post height. Provide socket covers designed and fabricated to resist accidental dislodgment.

1. Provide chain with eye, snap hook, and staple across gaps formed by removable railing sections at locations indicated. Fabricate from same metal as railings.

L. Shear and punch metals cleanly and accurately. Remove burrs from exposed cut edges.

M. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to the smallest radius possible without causing grain separation or otherwise impairing work.

N. Cut, reinforce, drill, and tap components, as indicated, to receive finish hardware, screws, and similar items.

O. Provide weepholes, or another means to evacuate entrapped water, in hollow sections of railing members that are exposed to exterior or to moisture from condensation or other sources.

P. Fabricate joints that will be exposed to weather in a manner to exclude water.

Q. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated.

R. Toe Boards: Where indicated, provide toe boards at railings around openings and at the edge of open-sided floors and platforms. Toeboard shall conform to OSHA standards. Toeboard shall be a minimum of 4" high and shall be an extrusion that attaches to the posts with clamps that will allow for expansion and contraction between posts. Toeboards shall be set 1/4" above the walking surface. Toeboards shall be provided on handrails as required by OSHA and/or as shown on drawings. Toeboards shall be shipped in stock lengths for field installation.

S. Fillers: Provide stainless-steel sheet or plate fillers, of thickness and size indicated or required to support structural loads of handrails, where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses to produce adequate bearing to prevent bracket rotation and overstressing substrate.

2.6 FINISHES, GENERAL

A. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering prior to shipment.
C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one half of the range of approved samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved samples and they are assembled or installed to minimize contrast.

D. Provide exposed fasteners with finish matching appearance, including color and texture, of handrails and railing systems.

2.7 ALUMINUM FINISHES

A. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.

B. Class II, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.01 mil or thicker) complying with AAMA 611.

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installing anchorages, such as sleeves, concrete inserts, anchor bolts, and miscellaneous items having integral anchors, that are to be embedded in concrete as masonry construction. Coordinate delivery of such items to Project site.

3.2 INSTALLATION, GENERAL

A. Fit exposed connections accurately together to form tight, hairline joints.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing handrails and railing systems. Set handrails and railing systems accurately in location, alignment, and elevation, measured from established lines and levels and free from rack.

1. Do not weld, cut, or abrade surfaces of handrails and railing components that have been coated or finished after fabrication and are intended for field connection by mechanical or other means without further cutting or fitting.

2. Set posts plumb within a tolerance of \( \frac{1}{4} \) inch in 12 feet (2 mm in 1 m).

3. Align rails so that variations from level for horizontal members and from parallel with rake of steps and ramps for sloping members do not exceed \( \frac{1}{4} \) inch in 12 feet (2 mm in 1 m).
C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing, and welded surface matches contours of adjoining surfaces.

D. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

E. Adjust handrails and railing systems prior to anchoring to ensure matching alignment at abutting joints. Space posts at interval indicated but not less than that required by design loadings.

F. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing handrails and railing systems and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

A. Non-welded Connections: Use mechanical joints for permanently connecting railing components. Locate exposed fasteners in least conspicuous locations. Seal recessed holes of exposed locking screws with plastic filler, cement colored to match finish of handrails and railing systems.

B. Expansion (Slip) Joints: Install expansion joints at locations indicated but not further apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches (50 mm) beyond joint on either side; fasten internal sleeve securely to one side; locate joint within 6 inches (150 mm) of post.

3.4 ANCHORING POSTS

A. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions indicated in project drawings:

3.5 ADJUSTING AND CLEANING

A. Clean the following metals by washing thoroughly with clean water and soap, followed by rinsing with clean water.

1. Aluminum.
3.6 PROTECTION

A. Protect finishes of handrails and railing systems from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period so that no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 05521
SPECIFICATIONS FOR ALUMINUM GRATINGS

PART 1 - GENERAL

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

1.2 SUMMARY
   A. This Section includes the following:
      1. Heavy Duty Aluminum Plank Grating by Ohio Gratings Inc., or approved equal.
   B. Related Sections: The following Sections contain requirements that relate to this Section:
      1. Division 05 Section "Aluminum Pipe and Tube Railings" for metal pipe and tube handrails and railing systems.

1.3 TERMINOLOGY
   A. Gratings shall be generically taken to mean aluminum planking at locations as indicated in the drawings. Specific type shall be as indicated in the Drawings.

1.4 PERFORMANCE REQUIREMENTS
   A. Structural Performance: Engineer, fabricate, and install gratings to withstand the following structural loads without exceeding the allowable design working stress of the grating materials, anchors, and connections.
      1. Gratings: Capable of withstanding a uniform load of 200 lb. per sq. ft. with a maximum deflection of ¼”.

1.5 SUBMITTALS
   A. General: Submit each item in this Article according to the Conditions of the Contract and Division 01 Specification Sections.
   B. Product data for formed metal grating, manufacturer's clips and anchorage devices for gratings, and paint products.
C. Shop drawings detailing fabrication and erection of gratings. Include plans, sections, and details of connections. Show anchorage and accessory items. Provide templates for anchors and bolts specified for installation under other sections.
   1. For installed gratings indicated to comply with certain design loadings, include structural analysis data sealed and signed by the qualified professional engineer who was responsible for their preparation.

D. Welder certificates signed by Contractor certifying that welders comply with requirements specified under "Quality Assurance" Article.

E. Qualification data for firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project name, addresses and names of architects and owners, and other information specified.

1.6 QUALITY ASSURANCE

A. Comply with applicable provisions and recommendations of the following: NAAMM Metal Bar Grating Manual designated ANSI/NAAMM MBG 531 (Aluminum and Light Duty Steel and Stainless Steel Grating).

B. Fabricator Qualifications: Firm experienced in producing gratings similar to that indicated for this Project with a record of successful in-service performance and with sufficient production capacity to produce required units without delaying the Work.

C. Engineer Qualifications: A professional engineer legally authorized to practice in jurisdiction where Project is located and experienced in providing engineering services of the kind indicated that have resulted in the installation of gratings similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance.

D. Welding Standards: Comply with applicable provisions of AWS D1.2 "Structural Welding Code—Aluminum".
   1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

1.7 PROJECT CONDITIONS

A. Field Measurements: Check actual locations of structural supports and other construction to which gratings must fit by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
PART 2 - PRODUCTS

2.1 ALUMINUM

A. Extruded Bars and Shapes: ASTM B 221 (ASTM B 221M), alloys as follows:
   1. 6061-T6 or 6063-T6 for bearing bars of gratings and shapes.
   2. 6061-T1 for grating cross bars.

2.2 FASTENERS

A. General: Provide stainless-steel fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade, and class required.

B. Fasteners for Aluminum Gratings: Provide fasteners of non-magnetic stainless steel warranted by the manufacturer to be noncorrosive and compatible with aluminum gratings and other components.

2.3 FABRICATION

A. General: Form from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support.
   1. Shear and punch metals cleanly and accurately.
   2. Remove sharp or rough areas on exposed traffic surfaces.
   3. Ease exposed edges to a radius of approximately 1/32 inch (1 mm), unless otherwise indicated.

B. Welding: Comply with AWS recommendations and the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.

C. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure gratings, frames, and supports rigidly in place and to support indicated loads.

D. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
2.4 ALUMINUM PLANK GRATING

A. Grating: Heavy Duty Aluminum Plank Grating by Ohio Gratings, Inc. or approved equal.

B. General: Design is based upon use of aluminum gratings as manufactured by Ohio Gratings, Inc. and terminology used herein may include reference to the specific performance or product of this manufacturer. Such reference shall be construed only as establishing the quality of materials, operational features and workmanship to be used under this Section and shall not, in any way, be construed as limiting competition.

   1. Comply with applicable provisions and recommendations of the following:
      NAAMM Metal Bar Grating Manual designated ANSI/NAAMM MBG 531 (Aluminum and Light Duty Steel and Stainless Steel Grating).

C. Fabricated panels from Type 6063-T6 aluminum plank panels to be made from 6” wide extruded sections and banded to form standard panel widths. Arrange panel limits to allow panel removal adjacent to cutouts without panel disassembly.

D. Surface: Punch style as indicated below with connection to webs to have two raised transverse ribs for stiffness and skid resistance. Provide slip-not surface treatment applied for added slip resistant treatment on top of aluminum plank surface.

   1. Unpunched

E. Sides: Plain.

F. Aluminum Finish: Mill

G. Available Manufacturers: Subject to compliance with requirements, manufacturers offering metal bar gratings that may be incorporated in the Work include, but are not limited to, the following:

   1. Ohio Gratings, Inc.
   2. Others (subject to prior approval)

H. Fabricate cutouts in grating sections for penetrations indicated. Arrange cutouts to permit grating removal without disturbing items penetrating gratings.

   1. Perform all cutting and fitting required for installation. Grating shall be placed such that cross bars align.
   2. Wherever grating is pierced by pipes, ducts and structural members, cut openings neatly and accurately to size and weld a rectangular band bar of the same height and material as the bearing bars.
   3. Cutouts for circular obstructions are to be no more than 1/2” larger in diameter than the obstruction.
   4. Utilize standard panel widths wherever possible.

I. Available Manufacturers: Subject to compliance with requirements, manufacturers offering metal bar gratings that may be incorporated in the Work include, but are not limited to, the following:

   1. IKG Borden.
2. Klemp Corp.
3. McNichols Co.
4. Ohio Gratings, Inc.
5. Thompson Fabricating.
6. Tru-weld, Inc.

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, including sleeves, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete construction. Coordinate delivery of such items to Project site.

3.2 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installation. Set accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Provide temporary bracing or anchors in formwork for items to be built into concrete, masonry, or similar construction.

C. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations.

D. Field Welding: Comply with the following requirements:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.

E. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, or dissimilar metals with a heavy coat of bituminous paint.

3.3 INSTALLING METAL GRATINGS

A. General: Install gratings to comply with recommendations of NAAMM grating standard referenced under Part 2 that apply to grating types and bar sizes indicated, including installation clearances and standard anchoring details.
B. Secure removable units to supporting members with type and size of clips and fasteners indicated, or, if not indicated, as recommended by grating manufacturer for type of installation conditions shown.

C. Secure non-removable units to supporting members by welding where both materials are the same; otherwise, fasten by bolting as indicated above.

END OF SECTION 05530
1. **GENERAL**

1.1 **SCOPE**

A. This specification covers repair, preparation of surfaces, performance and completion of painting of all interior and exterior surfaces on the following structures:

Wastewater Treatment Basin: All Interior and Exterior Surfaces.

B. The time for completion of this contract is based on a standard weekly work schedule of Monday through Friday. No work shall be scheduled or done on Saturday or Sunday, except for any required emergency maintenance work or if prior approval has been granted by the Engineer.

1.2 **WORK INCLUDED**

A. Preparation of surfaces which are to receive finishes
B. Handling, analysis and disposal of debris
C. Finish surfaces
D. Testing and cleaning

1.3 **RELATED WORK AND APPLICABLE REQUIREMENTS SPECIFIED ELSEWHERE**

A. **BIDDING REQUIREMENTS, CONTRACT FORM AND CONDITIONS OF THE CONTRACT AND GENERAL REQUIREMENTS** shall apply to all work included in this section.

1.4 **DOCUMENTS AND STANDARDS**

A. Coating manufacturer's printed instructions.
B. American Society of Testing Materials

1. ASTM B117 Salt Spray (Fog)
2. ASTM D149 Dielectric Strength
3. ASTM D4060 Abrasion
4. ASTM D4541 Adhesion
5. ASTM D4585 Humidity
6. ASTM G53 QUV Exposure
7. ASTM D4141 Exterior Exposure (EMMAQUA)
8. AAMA 2604 Exterior Exposure
C. Code of Federal Regulations

1. 29 CFR 1910 Occupational Safety and Health Standards (General Industry Standards)
2. 29 CFR 1910.134 Respiratory Protection
3. 29 CFR 1910.1020 Access to Employee Exposure and Medical Records
4. 29 CFR 1910.1025 Lead
5. 29 CFR 1910.1200 Hazard Communication
6. 29 CFR 1926 Safety and Health Regulations for Construction (Construction Industry Standards)
7. 40 CFR 50 National Primary and Secondary Ambient Air Quality Standards
8. 40 CFR 261 Identification and Listing of Hazardous Waste
9. 40 CFR 268 Land Disposal Restrictions
10. All other Applicable State and Federal Regulations

F. National Institute for Occupational Health and Safety

1. NIOSH Method 7082 Lead
2. All other Regulations

G. Occupational Safety and Health Administration

1. OSHA Booklet 3126 Working with Lead in the Construction Industry
2. All other Regulations

H. Steel Structures Painting Council (SSPC)

1. SSPC-SP 1 Solvent Cleaning
2. SSPC-SP 2 Hand Tool Cleaning
3. SSPC-SP 3 Power Tool Cleaning
4. SSPC-SP 6 Commercial Blast Cleaning
5. SSPC-SP 10-63 Near White Blast Cleaning

2. MATERIALS

2.1 QUALITY OF COATINGS
The paints and paint products of the Tnemec Company, Inc., mentioned in the following specifications are set up as standards of quality. The usual "or equal" clause shall apply. No request for substitution will be considered which decreases the film thickness and/or the number of coats to be applied, or which offers a change from the generic type of coating specified. Request for substitution shall contain the following:

A. FULL NAME OF EACH PRODUCT
B. DESCRIPTIVE LITERATURE
C. DIRECTIONS FOR USE
D. GENERIC TYPE
E. NON VOLATILE CONTENT BY VOLUME
F. PERFORMANCE DATA LISTED IN SECTION 8 OF THESE SPECIFICATIONS

Bidders desiring to use paints other than those specified shall submit their proposal based on the specified materials, together with the information noted above, and indicate the sum which will be added to or deducted from the base bid, should the alternate materials be acceptable. **In no case will the request be considered unless received, in writing, ten days prior to the bid opening date.**

2.2 CERTIFICATIONS

Upon completion of the job, the Contractor shall submit to the Engineer, certification from the manufacturer that indicates the quantity of each coating purchased was sufficient to properly coat all surfaces. Such certification shall make reference to the square footage figures provided to the manufacturer and the Engineer by the Contractor.

2.3 SHIPPING, STORAGE AND HANDLING

All paints shall be properly prepared by the manufacturer and delivered to the site for field painting in the original unbroken containers with manufacturer's label plainly printed thereon. Type of material to be applied at each location shall be submitted to the Engineer with the manufacturer's written recommendation of the type paint for each item to be painted.

All coatings shall be stored in an enclosed structure to protect them from weather and excessive heat or cold. Flammable coatings must be stored to conform to City, County, State and Federal safety codes for flammable coatings or paint materials. At all times coatings shall be protected from freezing.

3. APPLICATION

3.1 GENERAL

A. Prepare surface and touch-up welds, burned and abraded areas on primed steel with specified primer before applying field coats.

B. The painter shall mix, thin and apply each coating at the rate and manner specified by the manufacturer's printed instructions. During coating application, the paint shall be
stirred continuously, and no thinner shall be added after the paint has been mixed. Paint shall be worked into all joints, corners and surfaces. Should the quality of any coating be considered unsatisfactory by the Engineer, the Contractor shall remove the coating(s) as necessary and repaint at no additional coast to the Owner. Deficiencies in film thickness shall be corrected by the application of an additional coat(s) of paint.

C. Where multiple coating are required, the color of succeeding coats shall be different so any uncoated areas can be identified.

D. All coatings shall be applied in strict accordance with the applicable manufacturer's current printed product data sheet(s) and container labels. Coatings shall not be applied above or below the minimum and/or maximum surface temperatures as stated on the product data sheet(s) and shall not be applied to wet or damp surfaces, in rain, snow, fog or mist. Surface temperature must be at least 5°F above the dew point.

E. Painting shall be completed well in advance of the probable time of day when condensation will occur and/or the surface temperature is expected to drop below the minimum listed on the applicable product data sheet(s).

F. Finish coats shall be uniform in color and sheen without streaks, laps, runs, sags, brush strokes or missed areas.

G. The manufacturer's recommended curing time shall elapse before the next coat is applied. Adequate ventilation shall be provided for proper drying of paints on interior tank surfaces. A minimum of 7 days following the application of the final coat on the interior surfaces shall be allowed before the tank is flushed, disinfected or filled with water.

H. Clean-Up: All cloths and waste that might constitute a fire hazard shall be placed in closed metal containers or destroyed at the end of each day. Upon completion of the work, all staging, scaffolding, and containers shall be removed from the site and/or destroyed in an approved and legal manner. Paint spots, oil, or stains upon adjacent surfaces and floors shall be completely removed, and the entire job left clean and acceptable to the Engineer.

3.2 EXISTING UTILITIES, STRUCTURES AND PROPERTIES

It shall be the responsibility of the contractor to locate and avoid damage to any and all existing water, gas, sewer, electric, telephone, and other utilities, structures, or appurtenances. The Contractor shall repair or pay for all damages caused by his operations or his personnel to existing utilities, structures, appurtenances, or properties, either below ground or above ground and shall settle in full all damage suites which may arise as a result of his operations.

3.3 VENTILATION

It is essential that the solvent vapors released during and after application of coatings be removed from the tank. During coating application the capacity of ventilating fans shall
be at least 300 cfm per gallon of coating applied per hour. Continuous forced ventilation at a rate of at least one complete air change per 4 hours shall be provided for at least 7 days after coating application is completed. Air shall be exhausted from the lowest portions of the tank with the top openings kept open and clear.

4. **PAINTERS LOG AND TESTING EQUIPMENT**

4.1 **DAILY LOG**

The Contractor shall keep a daily log in which he shall record the following information:

A. **Air Temperature:** Air temperature readings shall be taken at intervals throughout the days work. Readings shall be taken at the start of the mornings work, mid day and afternoon. Should environmental conditions change, additional reading shall be taken to assure that coatings are being applied under the conditions as outlined by the coatings manufacturer.

B. **Surface Temperature:** Surface temperatures shall be taken in areas where work is being performed. Surface temperature shall be that as specified by the coatings manufacturer.

C. **Material Temperature:** Material temperature reading shall be taken prior to the application of the paint.

D. **Relative Humidity:** Relative humidity readings shall be taken at intervals throughout the days work. Readings shall be taken at the start of the mornings work, mid day and afternoon. Should environmental conditions change, additional reading shall be taken to assure that coatings are being applied under the conditions as outlined by the coatings manufacturer.

E. **Dew Point:** Dew point readings shall be taken at intervals throughout the days work. Readings shall be taken at the start of the mornings work, mid day and afternoon. Should environmental conditions change, additional reading shall be taken to assure that coatings are being applied under the conditions as outlined by the coatings manufacturer.

F. **Blast Profile:** Following blasting operations, the Contractor shall take and record the depth of the blast profile. Blast profile measurements shall be taken using Testex X Course Replica Tape. Replica Tape shall be included in the daily log.

G. **Detail or Work Performed During the Day:** Area where work was performed and the extent of the work performed shall be included in the daily log.

4.2 **TESTING EQUIPMENT**

In addition to the equipment required to take measurements which will be included in the daily log, The Contractor shall have on the project site the following testing equipment. Equipment shall be in calibration and proper working order.
A. **Dry Film Thickness Measurements Gauge:** Dry film thickness reading shall be taken with a properly calibrated (per the manufacturer's instructions) Type 1 (magnetic) or Type 2 (electromagnetic) instrument. Dry film thickness reading will be taken and recorded in the a frequency and manner as dictated by the Engineer.

B. **High Voltage Holiday Detection Equipment:** Interior surfaces, following a minimum of 24 hours cure, shall be holiday detected in accordance with NACE SP0188-99 high voltage holiday detection. Holiday detector shall be a Tinker & Rasor model AP/W Holiday D or equal. Areas found to have holidays shall be marked and repaired in accordance with the paint manufacturer's instructions. The Engineer shall be notified of time of testing so that he might be present to witness testing.

5. **SURFACE PREPARATION & PAINTING**

5.1 **EXTERIOR SURFACE PREPARATION**

Prior to surface preparation, all surfaces shall be cleaned of all oil and grease in accordance with SSPC-SP 1 Solvent Cleaning. All exterior surfaces shall be sand blasted to remove all dust, rust and scale, as well as all other foreign matter and shall result in a surface preparation equal to that of SSPC-SP 10 Near White Blast Cleaned Surface. Surface profile shall be 1.5 - 2.5 mils.

5.2 **INTERIOR SURFACE PREPARATION**

Prior to surface preparation, all surfaces shall be cleaned of all oil and grease in accordance with SSPC-SP 1 Solvent Cleaning. All interior surfaces shall be abrasive blasted to remove all dust, rust and scale, as well as all other foreign matter and shall result in a surface preparation equal to that of SSPC-SP 10 Near White Blast Cleaned Surface. Surface profile shall be 1.5 - 2.5 mils.

5.3 **COATING SYSTEM**

Following surface preparation, all interior and exterior surfaces shall be coated as hereinafter specified. The primer shall be applied in accordance with the recommendations of the manufacturer and not more than eight hours after surface preparation.

A. **EXISTING INTERIOR STEEL SURFACES (Field Applied System):**

1. **Prime:** All interior surfaces shall receive one full prime coat of *Tnemec Series 91H20 Hydro-Zinc* applied at a rate to achieve 2.5 – 3.5 mils DFT

2. **Pit Filler/Surfacer:** All pits not to be welded shall be filled flush utilizing *Tnemec Series 215 Surfacing Epoxy*.

3. **Stripe Coat:** All weld seams shall receive one coat of Tnemec Series 20-15BL Pota-Pox applied, by brush, at a rate to achieve 2.0 - 4.0 mils minimum DFT.
4. **Lining:** After proper cure of the prime coat, all interior surfaces shall be lined with one coat of *Tnemec Series 22-1255 Epoxoline* applied at a rate to achieve 25.0 – 35.0 mils DFT.

5. **THE INTERIOR COATING SYSTEMS SHALL HAVE A TOTAL DRY FILM THICKNESS OF NOT LESS THAN 27.5 MILS DFT.**

**B. NEW INTERIOR STEEL SURFACES (Shop Applied System):**

1. **Prime:** All interior surfaces shall receive one full prime coat of *Tnemec Series 1 Omnithane* applied at a rate to achieve 2.5 – 3.5 mils DFT.

2. **Stripe Coat:** All weld seams and difficult to coat areas shall receive one stripe coat, applied by brush, of *Tnemec Series 20-1255Pota-Pox* applied at a rate to achieve 2.0 – 4.0 mils DFT.

3. **Intermediate:** All surfaces shall receive one full intermediate coat of *Tnemec Series 20-1255Pota-Pox* applied at a rate to achieve 4.0 – 6.0 mils DFT.

4. **Finish:** All surfaces shall receive one full finish coat of *Tnemec Series 142-35GR Epoxoline* applied at a rate to achieve 10.0 – 12.0 mils DFT.

5. **THE INTERIOR COATING SYSTEMS SHALL HAVE A TOTAL DRY FILM THICKNESS OF NOT LESS THAN 16.5 MILS DFT.**

**C. EXTERIOR:**

1. **Prime:** All exterior surfaces that have been cleaned in accordance with the paragraph above shall receive one coat of *Tnemec Series 91 H20 Hydro-Zinc* applied at a rate to achieve 2.5 – 3.5 mils DFT.

2. **1st Intermediate:** After the prime coat has been properly installed, all exterior surfaces shall receive a 1st intermediate coat of *Tnemec Series 20-1255 Pota-Pox* applied at a rate to achieve 2.0 – 3.0 mils DFT.

3. **2nd Intermediate:** After the 1st intermediate coat has been properly installed, all exterior surfaces shall receive a second intermediate coat of *Tnemec Series 73 Endura-Shield* applied at a rate to achieve 2.0 – 3.0 mils DFT.

4. **Finish:** Following the intermediate coats, all exterior surfaces shall receive one full finish coat of *Tnemec Series 700 HydroFlon* applied at a rate to achieve 2.0 – 3.0 mils DFT.

5. **THE EXTERIOR COATING SYSTEM SHALL HAVE A MINIMUM DRY FILM THICKNESS OF 8.5 DRY MILS.**
6. **ACCEPTANCE OF WORK**

6.1 Damaged coatings, pinholes, and holidays shall have edges feathered and repaired in accordance with the recommendations of the manufacturer, as approved by the Engineer.

6.2 All finish coats, including touch up and damage-repair coats shall be applied in a manner which will present a uniform texture and color-match appearance.

6.3 If the item has an improper finish, color, or insufficient film thickness, the surface shall be cleaned and top coated with the specified material to obtain the specified color and coverage. Specific surface preparation information to be secured from the coatings manufacturer and the Engineer.

6.4 All visible areas of chipped, peeled, or abraded paint shall be hand or power-sanded, feathering the edges. The areas shall then be primed and finish coated in accordance with the specifications.

6.5 Work shall be free of runs, bridges, shiners, laps, or other imperfections. Evidence of these conditions shall be cause for rejection.

6.6 Any defects in the coating system shall be repaired by the Contractor per written recommendations of the coating manufacturer.

6.7 The Contractor shall verify that the tank water level indicators are operable and that the pulleys, cable and indicator run freely without binding.

7. **GUARANTEE AND ANNIVERSARY INSPECTION**

7.1 All work shall be warranted for a period of two years from the date of completion.

7.2 The Owner will notify the Contractor at least 30 days prior to the anniversary date and shall establish a date for the inspection. The basin will be drained and the Owner's representative and the Contractor shall thoroughly inspect all surfaces both inside and out. Any defects in the coating system shall be repaired by the Contractor at no additional cost to the Owner. Should a failure occur to 25% of the painted surface, either interior or exterior, the entire surface shall be cleaned and repainted in accordance with these Specifications.

8. **PRODUCT PERFORMANCE CRITERIA**

Provide the following product information and manufacturers published performance data should coatings or coating system be submitted in lieu of the standard of quality established in the project documents. Should the data not be available in a published format, or if the duration of the test does not meet the specified requirement, please respond in the appropriate space with NT (Not Tested).

8.1 **Organic Zinc Rich Urethane Primer (Interior Primer)**

A. Generic Type: Organic Zinc Rich Urethane Primer
B. Special Qualifications: Certified in accordance with ANSI/NSF Std 61 for contact with potable water in tanks of 8,000 gallons capacity or greater.
C. Solids By Volume: 63%
D. Zinc Content: 83% by weight. Zinc shall be ASTM D 520 Type III. ASTM D 520 Type II. ASTM D 520 Type I Zinc Dust Shall not be Allowed.
E. Test Criteria:

<table>
<thead>
<tr>
<th>Test Criteria</th>
<th>Test Duration</th>
<th>Proposed Product Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM B 117 Salt Spray (Fog)</td>
<td>50,000 hours (Scribed Panel)</td>
<td>Rust @ Scribe: Plane Rust: Blisters:</td>
</tr>
<tr>
<td>ASTM G 85 Prohesion</td>
<td>15,000 Hours</td>
<td>Rust @ Scribe: Plane Rust: Blisters:</td>
</tr>
<tr>
<td>ASTM D 4585 Humidity</td>
<td>4,000 hours</td>
<td>Rusting: Blistering:</td>
</tr>
<tr>
<td>ASTM 4541 Adhesion</td>
<td>Average of Three Tests</td>
<td>Adhesion PSI:</td>
</tr>
<tr>
<td>ASTM G8 Cathodic Disbondment</td>
<td>30 Days Exposure</td>
<td></td>
</tr>
<tr>
<td>Immersion Service (Potable Water)</td>
<td>7 years – No Failure</td>
<td></td>
</tr>
</tbody>
</table>

8.2 **NSF Approved Epoxy (Exterior 1st Intermediate - Interior New Steel Intermediate)**

A. Generic Type: Polyamide Epoxy
B. Special Qualifications: Certified in accordance with ANSI/NSF Std 61 for contact with potable water in tanks of 6,000 gallons capacity or greater.
C. Solids By Volume: 56%
D. Test Criteria:

<table>
<thead>
<tr>
<th>Test Criteria</th>
<th>Test Duration</th>
<th>Proposed Product Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM B 117 Salt Spray (Fog)</td>
<td>10,000 hours (Scribed Panel)</td>
<td>Rust @ Scribe: Plane Rust: Blisters:</td>
</tr>
<tr>
<td>ASTM G 85 Prohesion</td>
<td>15,000 Hours</td>
<td>Rust @ Scribe: Plane Rust: Blisters:</td>
</tr>
<tr>
<td>ASTM D 4585 Humidity</td>
<td>4,000 hours</td>
<td>Rusting: Blistering:</td>
</tr>
<tr>
<td>ASTM D 4060 Abrasion</td>
<td>CS-17 Wheel 1,000 Gram Load 1,000 Cycles</td>
<td>Report mg Loss / Average of three tests</td>
</tr>
<tr>
<td>ASTM 4541 Adhesion</td>
<td>Average of Three Tests</td>
<td>Adhesion PSI:</td>
</tr>
<tr>
<td>ASTM G8 Cathodic Disbondment</td>
<td>30 Days Exposure</td>
<td></td>
</tr>
<tr>
<td>Immersion Service (Potable Water)</td>
<td>7 years – No Failure</td>
<td></td>
</tr>
</tbody>
</table>
### 8.3 100% Solids Tank Lining

**A. Generic Type:** Modified Polyamine Epoxy  
**B. Special Qualifications:** Certified in accordance with ANSI/NSF Std 61 for contact with potable water in tanks of 5 gallons capacity or greater. Also meets the requirements set forth for AWWA C-210-07 testing.  
**C. Solids By Volume:** 100%.  
**D. Test Criteria:**

<table>
<thead>
<tr>
<th>Test Criteria</th>
<th>Test Duration</th>
<th>Proposed Product Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM D 5894 Cyclic Salt Fog/UV</td>
<td>10,000 hours</td>
<td>Rust:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blisters:</td>
</tr>
<tr>
<td>ASTM D 4585 Humidity</td>
<td>2,000 hours</td>
<td>Rusting:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blistering:</td>
</tr>
<tr>
<td>ASTM D 4060 Abrasion</td>
<td>CS-17 Wheel</td>
<td>Report mg Loss / Average of three tests</td>
</tr>
<tr>
<td></td>
<td>1,000 Gram Load</td>
<td>1,000 Cycles</td>
</tr>
<tr>
<td>ASTM 4541 Adhesion</td>
<td>After 6 months immersion in crude oil @ 275° F</td>
<td>Adhesion PSI:</td>
</tr>
<tr>
<td>ASTM G8 Cathodic Disbondment</td>
<td>Method A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30 Days Exposure</td>
<td></td>
</tr>
<tr>
<td>Immersion Service (Potable Water)</td>
<td>2 years – No Failure</td>
<td></td>
</tr>
<tr>
<td>ASTM D 870 Immersion Potable Water @ 200° F for 6 months</td>
<td>Blistering:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cracking:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rusting:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chalking:</td>
</tr>
<tr>
<td>ASTM D 870 Immersion 140° Deionized Water 2,000 Hours</td>
<td>Blistering:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cracking:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rusting:</td>
</tr>
<tr>
<td>ASTM D 2240 Hardness Average of 5 Tests</td>
<td>Report Shore D:</td>
<td></td>
</tr>
<tr>
<td>ASTM D 149 Dielectric Strength Average of 6 Tests</td>
<td>Report Volts.Mil:</td>
<td></td>
</tr>
</tbody>
</table>

### 8.4 Modified Amine Epoxy Lining (Finish Coat – New Steel)

**A. Generic Type:** Modified Polyamine Epoxy  
**B. Special Qualifications:** Highly Abrasion Resistant Epoxy Lining Suitable for Wastewater and other Aggressive Exposures  
**C. Solids By Volume:** 82%.  
**D. Test Criteria:**

<table>
<thead>
<tr>
<th>Test Criteria</th>
<th>Test Duration</th>
<th>Proposed Product Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM D 5894 Cyclic Salt Fog/UV</td>
<td>----</td>
<td>Rust @ Scribe:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Plane Rust:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blisters:</td>
</tr>
<tr>
<td>MIL-PRF-23236</td>
<td>----</td>
<td>Report: % Edge Retention</td>
</tr>
</tbody>
</table>
### Exterior 2nd Intermediate Coat

**A.** Generic Type: Aliphatic Acrylic Polyurethane  
**B.** Solids By Volume: 58%.  
**C.** Test Criteria:

<table>
<thead>
<tr>
<th>Test Criteria</th>
<th>Test Duration</th>
<th>Proposed Product Test Results</th>
</tr>
</thead>
</table>
| ASTM B 117 Salt Spray (Fog) | 3,000 hours (Scribed Panel) | Rust @ Scribe:  
|                       |                                                   | Plane Rust:  
|                       |                                                   | Blisters:  |
| ASTM G 85 Prohesion   | 15,000 Hours                                      | Rust @ Scribe:  
|                       |                                                   | Plane Rust:  
|                       |                                                   | Blisters:  |
| ASTM D 4585 Humidity  | 2,000 hours                                       | Rusting:  
|                       |                                                   | Blistering:  |
| ASTM D 4060 Abrasion  | CS-17 Wheel 1,000 Gram Load 1,000 Cycles         | Report mg Loss / Average of three tests  |
| ASTM 4541 Adhesion    | Average of Three Tests                            | Report PSI  |
| ASTM D 522 Flexibility| Method A Conical Mandrel                          | % Elongation:  |
| ASTM D 522 Flexibility| Method B Cylindrical Mandrel                       | % Gloss Retention:  
|                       |                                                   | Color Change:  |
| ASTM D 4141, Method   | 500 MJ/m2                                         | Rust @ Scribe:  |

---

<table>
<thead>
<tr>
<th>Edge Retention</th>
<th>Method A</th>
<th>Report: % Elongation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM D 522 Elongation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASTM D 149 Dielectric Strength</td>
<td>Average of 5 Tests</td>
<td>Volts/mil:</td>
</tr>
<tr>
<td>ASTM D 4585 Humidity</td>
<td>2,000 hours</td>
<td>Rusting: Blistering:</td>
</tr>
</tbody>
</table>
| ASTM G 85 Prohesion    | 5,000 Hours                                         | Rust @ Scribe:  
|                       |                                                   | Plane Rust:  
|                       |                                                   | Blisters:  |
| ASTM D 4060 Abrasion   | CS-17 Wheel 1,000 Gram Load 1,000 Cycles           | Report mg Loss / Average of three tests |
| ASTM D 968 Abrasion    | Average Three Tests                                 | Report:               |
| ASTM 4541 Adhesion     | Average of Three Tests                              | Adhesion PSI:         |
| Immersion Service      | 2 years                                             | Rusting: Blistering:  |
| (Potable Water)        |                                                     |                      |
| Immersion (140 F DI Water) | 2,000 hours                                       | Rusting: Blistering:  |

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### 8.5 Exterior 2nd Intermediate Coat
8.6 **Exterior Finish Coat**

A. Generic Type: Fluoropolymer Polyurethane
B. Solids By Volume: 60%.

C. Test Criteria:

<table>
<thead>
<tr>
<th>Test Criteria</th>
<th>Test Duration</th>
<th>Proposed Product Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM B 117 Salt Spray (Fog)</td>
<td>10,000 hours (Scribed Panel)</td>
<td>Rust @ Scribe: Plane Rust: Blisters:</td>
</tr>
<tr>
<td>ASTM D 4585 Humidity</td>
<td>3,000 hours</td>
<td>Rusting: Blistering:</td>
</tr>
<tr>
<td>ASTM D 4060 Abrasion</td>
<td>CS-17 Wheel 1,000 Gram Load 1,000 Cycles</td>
<td>Report mg Loss / Average of three tests</td>
</tr>
<tr>
<td>ASTM 4541 Adhesion</td>
<td>Average of Three Tests</td>
<td>Report PSI</td>
</tr>
<tr>
<td>ASTM D 4587 QUV Exposure Cycle 4: 8 hours UV – 4 hours condensation</td>
<td>16,000 hours</td>
<td>Gloss Retention:</td>
</tr>
<tr>
<td>ASTM D 4587 QUV Exposure Cycle 4: 8 hours UV – 4 hours condensation</td>
<td>25,000 hours</td>
<td>Gloss Retention: Color Change: DED FMCIII</td>
</tr>
<tr>
<td>ASTM D 4141 (EMMAQUA) Exterior Exposure</td>
<td>1,500MJ/m2 Exposure</td>
<td>Gloss Retention: Color Change:</td>
</tr>
<tr>
<td>ASTM D 4141 (EMMAQUA) Exterior Exposure</td>
<td>2,000MJ/m2 Exposure</td>
<td>Gloss Retention: Color Change:</td>
</tr>
<tr>
<td>ASTM D 4141 (EMMAQUA) Exterior Exposure</td>
<td>3,500MJ/m2 Exposure</td>
<td>Gloss Retention: Color Change:</td>
</tr>
<tr>
<td>ASTM D 522 Flexibility</td>
<td>Method A Conical Mandrel</td>
<td>Cracking: % Elongation:</td>
</tr>
<tr>
<td>ASTM 2794 Impact</td>
<td>Average of Three Trials</td>
<td>Direct Impact:</td>
</tr>
<tr>
<td>ASTM D 503’1 Weatherometer</td>
<td>5,500 hours</td>
<td>% Gloss Retention: Color Change: DED</td>
</tr>
<tr>
<td>AAMA 2604-98</td>
<td>5 Years Exposure</td>
<td>Report: Color Retention: Gloss Retention: Chalking: Erosion:</td>
</tr>
<tr>
<td>ASTM 3363 Pencil Hardness</td>
<td>Report Hardness:</td>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
<td>-----------------</td>
<td></td>
</tr>
</tbody>
</table>

*End of Section*