



**ST. TAMMANY PARISH**

MICHAEL B. COOPER  
PARISH PRESIDENT

**NOTICE TO BIDDERS**

**ST. TAMMANY PARISH**

Sealed bids will be received by the Department of Procurement, until 2:00 p.m., **Wednesday, October 18, 2023**, and then opened and read publicly at that time by the Procurement Staff for the following project:

**Bid # 23-3-2 - Cross Gates Water System - New Elevated Storage Tanks**

Each paper bid must be submitted in a sealed envelope. The outside of the envelope shall show the Name and Address of the Bidder, the State Contractor's License Number of the Bidder (if the work is estimated at \$50k or more), the Bid Name and the Bid Number.

**The project classification is:**

**Municipal & Public Work Construction**

This bid package is available online at [www.bidexpress.com](http://www.bidexpress.com) or LaPAC <https://wwwcfprd.doa.louisiana.gov/osp/lapac/pubmain.cfm>. It is the Vendor's responsibility to check Bid Express, or LaPAC frequently for any possible addenda that may be issued. The Parish is not responsible for a Vendor's failure to download any addenda documents required to complete a submission.

Bids will be received at 21454 Koop Dr., Suite 2F, Mandeville, LA 70471 from each bidder or his agent and given a written receipt, by certified mail with return receipt requested, or electronically at [www.bidexpress.com](http://www.bidexpress.com).

**The Non-Mandatory pre-bid meeting will be held at St. Tammany Parish Government Office Complex, Building "B" 21454 Koop Dr. Mandeville, LA 70471, 3<sup>rd</sup> Floor Staff Conference Room on Tuesday, September 26, 2023, from 9:00 AM to 10:00 AM.**

Procurement Department

# BID PROPOSAL

ST. TAMMANY PARISH  
GOVERNMENT



BID PACKAGE FOR  
**CROSS GATES WATER SYSTEM  
NEW ELEVATED STORAGE TANKS**

**LDH/OPH Permit No. P 23-09-103-103**

BID NO.: 23-3-2

August, 2023

Construction Estimate:  
\$5,400,000.



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## Section 02

### Instructions to Bidders

Bidders are urged to promptly review the requirements of this specification and submit questions for resolution as early as possible during the bid period. Questions or concerns must be submitted in writing to the Procurement Department no later than 2:00 CST seven (7) working days prior to the bid opening date. Otherwise, this will be construed as acceptance by the bidders that the intent of the specifications is clear and that competitive bids may be obtained as specified herein. Protests with regard to the specification documents will not be considered after bids are opened.

1. Bid security is required. Be sure that your bid includes such security as is necessary to meet Parish requirements and is properly signed. The bid must be fully completed. All applicable Louisiana license numbers must be affixed.
2. The Owner is the St. Tammany Parish Government (the “Parish”).
3. The terms “he/his” and “it/its” may be used interchangeably.
4. The terms “Owner,” the “Parish,” and “St. Tammany Parish” may be used interchangeably.
5. The successful Bidder understands the limited contract time in the contract is **553 calendar days**, and shall submit any request for an extension of time in accordance with the General and Supplementary Conditions. Said request will reflect the days requested and the reason for same. No extension request is guaranteed or absolute.
6. Bidder specifically understands that acknowledgment of the General Conditions is required. Bidder specifically understands that signature of receipt of the General Conditions is mandated. **The Bidder’s signature on the “Louisiana Uniform Public Work Bid Form” will serve as acknowledgment of the Bidder’s receipt and understanding of the General Conditions as well as any Supplementary Conditions.**
7. ***If any additional work is performed by the contractor without written approval by owner, the cost of the work will be borne by the contractor and will not be reimbursed by the Parish.***
8. **Only** the Louisiana Uniform Public Bid Form, the Unit Price Form (if necessary), the bid security, and written evidence of authority of person signing the bid shall be submitted on or before the bid opening time and date provided for in the Bid Documents. Necessary copies of the Louisiana Uniform Public Work Forms and Unit Price Forms (if necessary) will be furnished for Bidding. Bound sets of the Contract Documents are for Bidder's information and should not be used in submitting Bids.

9. All other documents and information required are to be submitted by the low Bidder within ten (10) days after the opening of the bids, and at the same time of day and location as given for the opening of the bids in the Bid Documents.
10. Each Bid must be submitted in a sealed envelope, unless submitted electronically. The outside of the envelope shall show the name and address of the Bidder, the State Contractor's License Number of the Bidder (if work requires contractor's license), and the Project name and the Bid number. In the case of an electronic bid proposal, a contractor may submit an authentic digital signature on the electronic bid proposal accompanied by the contractor's license number, Project name and the Bid number.
11. The price quoted for the Work shall be stated in words and figures on the Bid Form, and in figures only on the Unit Price Form. The price in the Bid shall include all costs necessary for the complete performance of the Work in full conformity with the conditions of the Contract Documents, and shall include all applicable Federal, State, Parish, Municipal or other taxes. The price bid for the items listed on the Unit Price Form will include the cost of all related items not listed, but which are normally required to do the type of Work bid.
12. The Bid shall be signed by the Bidder. The information required on the Louisiana Uniform Public Work Bid Form must be provided. Evidence of agency, corporate, or partnership authority is required and shall be provided in conformance with LSA-R.S. 38:2212(B).
13. Only a Contractor licensed by the State to do the type of Work as indicated on the Notice to Bidders can submit a Bid. The Bidder's signature on the Bid Form certifies that he holds an active license under the provisions of Chapter 24 of Louisiana Revised Statutes Title 37. Failure to be properly licensed constitutes authority for the Owner to reject the Bid.
14. Bidders shall not attach any conditions or provisions to the Bid. Any conditions or provisions so attached may, at the sole option of the Owner, cause rejection of the Bid.
15. A Bid Guarantee of five percent (5%) of the amount of the total Bid, including Alternates, must accompany the Proposal and, at the option of the Bidder, may be a cashier's check, certified check or a satisfactory Bid Bond. The Bid Guarantee must be attached to the Louisiana Uniform Public Work Bid Form. No Bid will be considered unless it is so guaranteed. Cashier's check or certified check must be made payable to the order of the Owner. Cash deposits will not be accepted. The Owner reserves the right to cash or deposit the cashier's check or certified check. Such guarantees shall be made payable to the Parish of St. Tammany. In accordance with LSA-R.S. 38:2218(C), if a bid bond is used, it shall be written by a surety or insurance company currently on the U.S. Department of the Treasury Financial Management Service list of approved bonding companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an A- rating in the latest printing of the A.M. Best's Key Rating Guide to write individual bonds up to ten percent of policyholders' surplus as shown in the A.M. Best's Key Rating Guide or by an insurance company in good standing licensed to write bid bonds which is either domiciled in Louisiana or owned by Louisiana residents. It is **not** required to be on any AIA form.

16. Bid securities of the three (3) lowest Bidders will be retained by the Owner until the Contract is executed or until final disposition is made of the Bids submitted. Bid securities of all other Bidders will be returned promptly after the canvas of Bids. Bids shall remain binding for forty-five (45) days after the date set for Bid Opening. The Parish shall act within the forty-five (45) days to award the contract to the lowest responsible bidder or reject all bids. However, the Parish and the lowest responsible bidder, by mutual written consent, may agree to extend the deadline for award by one or more extensions of thirty (30) calendar days. In the event the Owner issued the Letter of Award during this period, or any extension thereof, the Bid accepted shall continue to remain binding until the execution of the Contract.
17. A Proposal may be withdrawn at any time prior to the scheduled closing time for receipt of Bids, provided the request is in writing, executed by the Bidder or its duly authorized representative and is filed with the Owner prior to that time. When such a request is received, the Proposal will be returned to the Bidder unopened. A bid withdrawn under the provisions of LSA-R.S. 38:2214(C) cannot be resubmitted.
18. Written communications, over the signature of the Bidder, to modify Proposals will be accepted and the Proposal corrected in accordance therewith if received by the Owner prior to the scheduled closing time for receipt of Bids. Oral, telephonic or telegraphic Modifications will not be considered.
19. No oral interpretation obligating the Owner will be made to any Bidder as to the meaning of the Drawings, Specifications and Contract Documents. Every request for such an interpretation shall be made in writing and addressed and forwarded to the Owner. Inquiries received within seven (7) days prior to the day fixed for opening of the Bids may not be given consideration. Every interpretation made to the Bidder shall be in the form of an addendum to the Specifications. All such Addenda shall become part of the Contract Documents. Failure of the Owner to send or failure of Bidder to receive any such interpretation shall not relieve any Bidder from any obligation under this Bid as submitted without Modification. All Addenda shall be issued in accordance with the Public Bid Law, LSA-R.S. 38:2212(O).
20. The Owner reserves the right to reject any or all Bids for just cause in accordance with the Public Bid Law, LSA-R.S. 38:2214(B). Incomplete, informal, illegible, or unbalanced Bids may be rejected. Reasonable grounds for belief that any one Bidder is concerned directly or indirectly with more than one Bid will cause rejection of all Bids wherein such Bidder is concerned. If required, a Bidder shall furnish satisfactory evidence of its competence and ability to perform the Work stipulated in its Proposal. Incompetence will constitute cause for rejection. If the Parish determines that the bidder is not responsive or responsible for any reason whatsoever, the bid may be rejected in accordance with State law.
21. Contractor shall be liable without limitation to the Parish for any and all injury, death, damage, loss, destruction, damages, costs, fines, penalties, judgments, forfeitures, assessments, expenses (including attorney fees), obligations, and other liabilities of every



name and description, which may occur or in any way arise out of any act or omission of Contractor, its owners, agents, employees, partners or subcontractors.

22. Upon notice of any claim, demand, suit, or cause of action against the Parish, alleged to arise out of or be related to this Contract, Contractor shall investigate, handle, respond to, provide defense for, and defend at its sole expense, even if the claim, demand, suit, or cause of action is groundless, false, or fraudulent. The Parish may, but is not required to, consult with or assist the Contractor, but this assistance shall not affect the Contractor's obligations, duties, and responsibilities under this section. Contractor shall obtain the Parish's written consent before entering into any settlement or dismissal.
23. It is understood and agreed that neither party can foresee the exigencies beyond the control of each party which arise by reason of an Act of God or force majeure; therefore, neither party shall be liable for any delay or failure in performance beyond its control resulting from an Act of God or force majeure. The Parish shall determine whether a delay or failure results from an Act of God or force majeure based on its review of all facts and circumstances. The parties shall use reasonable efforts, including but not limited to, use of continuation of operations plans (COOP), business continuity plans, and disaster recovery plans, to eliminate or minimize the effect of such events upon the performance of their respective duties under this Contract.
24. Contractor shall fully indemnify and hold harmless the Parish, without limitation, for any and all injury, death, damage, loss, destruction, damages, costs, fines, penalties, judgments, forfeitures, assessments, expenses (including attorney fees), obligations, and other liabilities of every name and description, which may occur or in any way arise out of any act or omission of Contractor, its owners, agents, employees, partners or subcontractors. The Contractor shall not indemnify for the portion of any loss or damage arising from the Parish's act or failure to act.
25. Contractor shall fully indemnify and hold harmless the Parish, without limitation, from and against damages, costs, fines, penalties, judgments, forfeitures, assessments, expenses (including attorney fees), obligations, and other liabilities in any action for infringement of any intellectual property right, including but not limited to, trademark, trade-secret, copyright, and patent rights.

When a dispute or claim arises relative to a real or anticipated infringement, the Contractor, at its sole expense, shall submit information and documentation, including formal patent attorney opinions, as required by the Parish.

If the use of the product, material, service, or any component thereof is enjoined for any reason or if the Contractor believes that it may be enjoined, Contractor, while ensuring appropriate migration and implementation, data integrity, and minimal delays of performance, shall at its sole expense and in the following order of precedence: (i) obtain for the Parish the right to continue using such product, material, service, or component thereof; (ii) modify the product, material, service, or component thereof so that it becomes a non-infringing product, material, or service of at least equal quality and performance;

(iii) replace the product, material, service, or component thereof so that it becomes a non-infringing product, material, or service of at least equal quality and performance; or, (iv) provide the Parish monetary compensation for all payments made under the Contract related to the infringing product, material, service, or component, plus for all costs incurred to procure and implement a non-infringing product, material, or service of at least equal quality and performance. Until this obligation has been satisfied, the Contractor remains in default.

The Contractor shall not be obligated to indemnify that portion of a claim or dispute based upon the Parish's unauthorized: i) modification or alteration of the product, material or service; ii) use of the product, material or service in combination with other products not furnished by Contractor; or, iii) use of the product, material or service in other than the specified operating conditions and environment.

26. Bidders shall familiarize themselves with and shall comply with all applicable Federal and State Laws, municipal ordinances and the rules and regulations of all authorities having jurisdiction over construction of the Project, which may directly or indirectly affect the Work or its prosecution. These laws and/or ordinances will be deemed to be included in the Contract, as though herein written in full.
27. Each Bidder shall visit the site of the proposed Work and fully acquaint itself with all surface and subsurface conditions as they may exist so that it may fully understand this Contract. Bidder shall also thoroughly examine and be familiar with drawings, Specifications and Contract Documents. The failure or omission of any Bidder to receive or examine any form, instrument, Drawing or document or to visit the site and acquaint itself with existing conditions shall in no way relieve any Bidder from any obligation with respect to its Bid and the responsibility in the premises.
28. The standard contract form enclosed with the Proposal documents is a prototype. It is enclosed with the Contract Documents for the guidance of the Owner and the Contractor. It has important legal consequences in all respects and consultation with an attorney is encouraged. Contractor shall be presumed to have consulted with its own independent legal counsel.
29. When one set of Contract plans show the Work to be performed by two or more prime Contractors, it is the responsibility of each Bidder to become knowledgeable of the Work to be performed by the other where the Work upon which this bid is submitted is shown to come into close proximity or in conflict with the Work of the other. In avoiding conflicts, pressure pipe lines must be installed to avoid conflict with gravity pipe lines and the Bidder of the smaller gravity pipe line in conflict with the larger gravity pipe line must include in his Bid the cost of a conflict box at these locations. The location of and a solution to the conflicts do not have to be specifically noted as such on the plans.

30. Bidder shall execute affidavit(s) attesting compliance with LSA-R.S. 38:2212.10, 38:2224, 38:2227, each as amended, and other affidavits as required by law, prior to execution of the contract.
31. Sealed Bids shall be delivered to St. Tammany Parish Government at the office of **St. Tammany Parish Government, Department of Procurement, 21454 Koop Drive, Suite 2-F, Mandeville, LA 70471**, and a receipt given, until the time and date denoted in Notice to Bidders, at which time and place the Bids shall be publicly opened and read aloud to those present. In accordance with LSA-R.S. 38:2212(H), the designer's final estimated cost of construction shall be read aloud upon opening bids. Sealed Bids may also be mailed by certified mail to **St. Tammany Parish Government, Department of Procurement, 21454 Koop Drive, Suite 2-F, Mandeville, LA 70471**, and must be received before the bid opening. Bids may also be submitted electronically. Information concerning links for electronic bidding is contained in the Notice to Bidders. It is the responsibility of the Bidders to ensure that bids are delivered in a timely fashion. **Late bids, regardless of reason, will not be considered, and will be returned to bidder.**
32. Paper bids shall be placed in a sealed envelope, marked plainly and prominently as indicated in the Notice to Bidders, and these Instructions, and addressed:

**St. Tammany Parish Government  
Department of Procurement  
21454 Koop Drive, Suite 2-F  
Mandeville, LA 70471**

33. See Notice to Bidders for availability of Drawings, Specifications and Contract Documents via electronic methods.
34. The successful Bidder shall be required to post in each direction a public information sign, 4' x 4' in size, at the location of the project containing information required by the Owner. The Owner shall supply this information.
35. The award of the Contract, if it is awarded, will be to the lowest responsible Bidder, in accordance with State Law. No award will be made until the Owner has concluded such investigations as it deems necessary to establish the responsibility and qualifications of the Bidder to do the Work in accordance with the Contract Documents to the satisfaction of the Owner within the time prescribed as established by the Department based upon the amount of work to be performed and the conditions of same. The written contract and bond shall be issued in conformance with LSA-R.S. 38:2216. If the Contract is awarded, the Owner shall give the successful Bidder written notice of the award within forty-five (45) calendar days after the opening of the Bids in conformance with LSA-R.S. 38:2215(A), or any extension as authorized thereunder.
36. At least three days prior to the execution of the Contract, the Contractor shall deliver to the Owner the required Bonds.

37. Failure of the successful Bidder to execute the Contract and deliver the required Bonds within ten (10) days of the Notice of the Award shall be just cause for the Owner to annul the award and declare the Bid and any guarantee thereof forfeited. Award may then be made to the next lowest responsible bidder.
38. In order to ensure the faithful performance of each and every condition, stipulation and requirement of the Contract and to indemnify and hold harmless the Owner from any and all damages, either directly or indirectly arising out of any failure to perform same, the successful Bidder to whom the Contract is awarded shall furnish a Performance and Payment Bond in an amount of at least equal to one hundred percent (100%) of the Contract Price. The Contract shall not be in force or binding upon the Owner until such satisfactory Bond has been provided to and approved by the Parish. The cost of the Bond shall be paid for by the Contractor unless otherwise stipulated in the Special Provisions.
39. No surety Company will be accepted as a bondsman which has no permanent agent or representative in the State upon whom notices referred to in the General Conditions of these Specifications may be served. Service of said notice on said agent or representative in the State shall be equal to service of notice on the President of the Surety Company, or such other officer as may be concerned.
40. In conformance with LSA-R.S. 38:2219(A)(1)(a), (b), and (c):

Any surety bond written for a public works project shall be written by a surety or insurance company currently on the U.S. Department of the Treasury Financial Management Service list of approved bonding companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an A- rating in the latest printing of the A.M. Best's Key Rating Guide, to write individual bonds up to ten percent of policyholders' surplus as shown in the A.M. Best's Key Rating Guide or by an insurance company that is either domiciled in Louisiana or owned by Louisiana residents and is licensed to write surety bonds.

For any public works project, no surety or insurance company shall write a bond which is in excess of the amount indicated as approved by the U.S. Department of the Treasury Financial Management Service list or by a Louisiana domiciled insurance company with an A- rating by A.M. Best up to a limit of ten percent of policyholders' surplus as shown by A.M. Best; companies authorized by this Paragraph who are not on the treasury list shall not write a bond when the penalty exceeds fifteen percent of its capital and surplus, such capital and surplus being the amount by which the company's assets exceed its liabilities as reflected by the most recent financial statements filed by the company with the Department of Insurance.

In addition, any surety bond written for a public works project shall be written by a surety or insurance company that is currently licensed to do business in the state of Louisiana. All contractors must comply with any other applicable provisions of LSA-R.S. 38:2219.

41. Should the Contractor's Surety, even though approved and accepted by the Owner, subsequently remove its agency or representative from the State or become insolvent, bankrupt, or otherwise fail, the Contractor shall immediately furnish a new Bond in another company approved by the Owner, at no cost to the Owner. The new Bond shall be executed under the same terms and conditions as the original Bond. The new bond shall be submitted within thirty (30) days of such time as the Owner notifies Contractor or from the time Contractor learns or has reason to know that the original surety is no longer financially viable or acceptable to the Parish, whichever occurs first. In the event that Contractor fails or refuses to timely secure additional surety, then the Owner may secure such surety and thereafter deduct such cost or expense from any sum due, or to become due to Contractor.
42. The Contractor's bondsman shall obligate itself to all the terms and covenants of these Specifications and of contracts covering the Work executed hereunder. The Owner reserves the right to do Extra Work or make changes by altering, adding to deducting from the Work under the conditions and in the manner herein before described without notice to the Contractor's surety and without in any manner affecting the liability of bondsman or releasing it from any of its obligations hereunder.
43. The Bond shall also secure for the Owner the faithful performance of the Contract in strict accordance with plans, specifications, and other Contract Documents. It shall protect the Owner against all lien laws of the State and shall provide for payment of reasonable attorney's fees for enforcement of Contract and institution or concursus proceedings, if such proceedings become necessary. Likewise, it shall provide for all additional expenses of the Owner occurring through failure of the Contractor to perform.
44. The surety of the Contractor shall be and does hereby declare and acknowledge itself by acceptance to be bound to the Owner as a guarantor, jointly and in solido, with the Contractor, for fulfillment of terms of the Contract.
45. The performance Bond and Labor and Material Bond forming part of this Contract shall be continued by Contractor and its Surety for a period of one (1) year from date of acceptance of the Work/Project by Owner to assure prompt removal and replacement of all defective material, equipment, components thereof, workmanship, etc., and to assure payment of any damage to property of Owner or others as a result of such defective materials, equipment, workmanship, etc.
46. Contractor, upon receipt of the executed contract, bond, change order, purchase order, and Notice to Proceed shall record the contract and bond with the Clerk of Court, obtain a Certificate of Recordation from the Clerk of Court, and forward this Certificate immediately to the Department of Procurement. The Department will not issue the purchase order until receipt of the Certificate of Recordation.
47. Contractor shall secure and maintain at its expense such insurance that will protect it and the Parish from claims for injuries to persons or damages to property which may arise from or in connection with the performance of Services or Work hereunder by the Contractor,

his agents, representatives, employees, and/or subcontractors. The cost of such insurance shall be included in Contractor's bid.

48. The Contractor shall not commence work until it has obtained all insurance as required for the Parish Project. If the Contractor fails to furnish the Parish with the insurance protection required and begins work without first furnishing Parish with a currently dated certificate of insurance, the Parish has the right to obtain the insurance protection required and deduct the cost of insurance from the first payment due the Contractor. Further deductions are permitted from future payments as are needed to protect the interests of the Parish including, but not limited to, renewals of all policies.
49. Payment of Premiums: The insurance companies issuing the policy or policies shall have no recourse against the Parish of St. Tammany for payment of any premiums or for assessments under any form of policy.
50. Deductibles: Any and all deductibles in the described insurance policies shall be assumed by and be at the sole risk of the Contractor.
51. Authorization of Insurance Company(ies) and Rating: All insurance companies must be authorized to do business in the State of Louisiana and shall have an A.M. Best rating of no less than A-, Category VII.
52. Policy coverages and limits must be evidenced by Certificates of Insurance issued by Contractor's carrier to the Parish and shall reflect:

Date of Issue: Certificate must have current date.

Named Insured: The legal name of Contractor under contract with the Parish and its principal place of business shall be shown as the named insured on all Certificates of Liability Insurance.

Name of Certificate Holder: St. Tammany Parish Government, Office of Risk Management, P. O. Box 628, Covington, LA 70434

Project Description: A brief project description, including Project Name, Project Number and/or Contract Number, and Location.

Endorsements and Certificate Reference: All policies must be endorsed to provide, and certificates of insurance must evidence the following:

Waiver of Subrogation: The Contractor's insurers will have no right of recovery or subrogation against the Parish of St. Tammany, it being the intention of the parties that all insurance policy(ies) so affected shall protect both parties and be the primary coverage for any and all losses covered by the below described insurance. *Policy endorsements required for all coverages.*

Additional Insured: The Parish of St. Tammany shall be named as additional named insured with respect to general liability, marine liability, pollution/environmental liability, automobile liability and excess liability coverages. *Policy endorsements required.*

Hold Harmless: Contractor's liability insurers shall evidence their cognizance of the Hold Harmless and Indemnification in favor of St. Tammany Parish Government by referencing same on the face of the Certificate(s) of Insurance.

Cancellation Notice: Producer shall provide thirty (30) days prior written notice to the Parish of policy cancellation or substantive policy change.

53. The types of insurance coverage the Contractor is required to obtain and maintain throughout the duration of the Contract shall be designated by a separate document issued by the Office of Risk Management.
54. It is the intent of these instructions that they are in conformance with State Bid Laws. Should there be any discrepancy or ambiguity in these provisions, the applicable State Bid Law shall apply.
55. The letting of any public contract in connection with funds that are granted or advanced by the United States of America shall be subject to the effect, if any, of related laws of said United States and valid rules and regulations of federal agencies in charge, or governing use and payment of such federal funds.
56. Protests based on alleged solicitation improprieties that are apparent before bid opening, or the time set for receipt of initial proposals must be filed with and received by the Procurement Department BEFORE these times. Any other protest shall be filed no later than ten (10) calendar days after: the opening of the bid; the basis of the protest is known; or the basis of the protest should have been known (whichever is earlier).
57. It is the Parish's policy to provide a method to protest exclusion from a competition or from the award of a contract, or to challenge an alleged solicitation irregularity. It is always better to seek a resolution within the Parish system before resorting to outside agencies and/or litigation to resolve differences. All protests must be made in writing, and shall be concise and logically presented to facilitate review by the Parish. The written protest shall include:

The protester's name, address, and fax and telephone numbers and the solicitation, bid, or contract number;

A detailed statement of its legal and factual grounds, including a description of the resulting prejudice to the protester;

Copies of relevant documents;

All information establishing that the protester is an interested party and that the protest is timely; and

A request for a ruling by the agency; and a statement of the form of relief requested.

The protest shall be addressed to St. Tammany Parish Government Department of Procurement, P.O. Box 628, Covington, LA 70434

The protest review shall be conducted by the Parish Legal Department.

Only protests from interested parties will be allowed. Protests based on alleged solicitation improprieties that are apparent before bid opening, or the time set for receipt of initial proposals, must be filed with and received by the Department of Procurement BEFORE those deadlines.

Any other protest shall be filed no later than ten (10) calendar days after the basis of the protest is known, or should have been known (whichever is earlier).

The Parish will use its best efforts to resolve the protest within thirty (30) days of the date that it is received by the Parish. The written response will be sent to the protestor via mail and fax, if a fax number has been provided by the protestor. The protester can request additional methods of notification.

58. The last day to submit questions and/or verification on comparable products will be no later than 2:00 pm CST, seven (7) working days prior to the opening date of the bid/proposal due date. Further, any questions or inquires must be submitted via fax to 985-898-5227, or via email to [Procurement@stpgov.org](mailto:Procurement@stpgov.org). Any questions or inquiries received after the required deadline to submit questions or inquiries will not be answered.
59. St. Tammany Parish Government contracts to be awarded are dependent on the available funding and/or approval by members designated and/or acknowledged by St. Tammany Parish Government. At any time, St. Tammany Parish Government reserves the right to cancel the award of a contract if either or both of these factors is deficient.
60. Any action by the Parish to disqualify any Bidder on the grounds that they are not a responsible Bidder shall be conducted in accordance with LSA-R.S. 38:2212(X).
61. Failure to complete or deliver within the time specified or to provide the services as specified in the bid or response will constitute a default and may cause cancellation of the contract. Where the Parish has determined the contractor to be in default. The Parish reserves the right to purchase any or all products or services covered by the contract on the open market and to charge the contractor with the cost in excess of the contract price. Until such assessed charges have been paid, no subsequent bid or response from the defaulting contractor will be considered.



62. If any part of the provisions contained herein and/or in the Specifications and Contract for the Work shall for any reason be held invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provisions of this Agreement or attachment, but it shall be construed as if such invalid, illegal, or unenforceable provision or part of a provision had never been contained herein.

## Section 03

### Summary of Work

**I.** Work to Include:

New elevated steel water storage tanks, controls, piping, site grading and drainage, electrical service, equipment, utility lines and other related items at the Willow Wood and Ozone Pines sites.

**II.** Location of Work:

Ozone Pines – 61134 N. Military Road, Slidell, LA 70461-1802  
Willow Wood – 200 Cross Gates Blvd., Slidell, LA 70461-4119

**III.** Documents: Bid Documents dated August 2023, and entitled:

CROSS GATES WATER SYSTEM  
NEW ELEVATED STORAGE TANKS  
BID NO.23-3-2

**IV.** OTHER REQUIREMENTS (as applicable)

**When not otherwise specified herein, all work and materials shall conform to the requirements of the Louisiana Department of Transportation and Development hereafter called LDOTD (2006 Edition of Louisiana Standard Specifications for Roads and Bridges).**

**If the parties anticipate that federal funding may be applied to the project stated under this section, the Provider/Contractor must comply and assure compliance with Section 11 Federal Clauses where applicable.**

**Section 04**

**LOUISIANA UNIFORM PUBLIC WORK BID FORM**

**TO:** St. Tammany Parish Government  
21454 Koop Dr., Suite 2F  
Mandeville, La 70471

*(Owner to provide name and address of owner)*

**BID FOR:** Cross Gates Water System  
New Elevated Storage Tanks  
Bid No.23-3-2.

*(Owner to provide name of project and other identifying information.)*

The undersigned bidder hereby declares and represents that she/he; a) has carefully examined and understands the Bidding Documents, b) has not received, relied on, or based his bid on any verbal instructions contrary to the Bidding Documents or any addenda, c) has personally inspected and is familiar with the project site, and hereby proposes to provide all labor, materials, tools, appliances and facilities as required to perform, in a workmanlike manner, all work and services for the construction and completion of the referenced project, all in strict accordance with the Bidding Documents prepared by: Principal Engineering, Inc. and dated: July, 2023.

*(Owner to provide name of entity preparing bidding documents.)*

Bidders must acknowledge all addenda. The Bidder acknowledges receipt of the following **ADDENDA:** (Enter the number the Designer has assigned to each of the addenda that the Bidder is acknowledging)

\_\_\_\_\_.

**TOTAL BASE BID:** For all work required by the Bidding Documents (including any and all unit prices designated “Base Bid” \* but not alternates) the sum of:

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)

**ALTERNATES:** For any and all work required by the Bidding Documents for Alternates including any and all unit prices designated as alternates in the unit price description.

**Alternate No. 1** *Deduct for Construct Willow Wood 300,000 Gallon Tank & Improvements (TU22000204)* for the lump sum of:

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)

**Alternate No. 2** *Deduct for Construct Ozone Pines 300,000 Gallon Tank & Improvements (TU22000209)* for the lump sum of:

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)

**Alternate No. 3** *(Owner to provide description of alternate and state whether add or deduct)* for the lump sum of:

N.A. \_\_\_\_\_ Dollars (\$ \_\_\_\_\_)

**NAME OF BIDDER:** \_\_\_\_\_

**ADDRESS OF BIDDER:** \_\_\_\_\_

**LOUISIANA CONTRACTOR’S LICENSE NUMBER:** \_\_\_\_\_

**NAME OF AUTHORIZED SIGNATORY OF BIDDER:** \_\_\_\_\_

**TITLE OF AUTHORIZED SIGNATORY OF BIDDER:** \_\_\_\_\_

**SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER \*\*:** \_\_\_\_\_

**DATE:** \_\_\_\_\_

**THE FOLLOWING ITEMS ARE TO BE INCLUDED WITH THE SUBMISSION OF THIS LOUISIANA UNIFORM PUBLIC WORK BID FORM:**

\* The Unit Price Form shall be used if the contract includes unit prices. Otherwise it is not required and need not be included with the form. The number of unit prices that may be included is not limited and additional sheets may be included if needed.

\*\* **A CORPORATE RESOLUTION OR WRITTEN EVIDENCE** of the authority of the person signing the bid for the public work as prescribed by LA R.S. 38:2212(B)(5).

**BID SECURITY** in the form of a bid bond, certified check or cashier's check as prescribed by LA R.S. 38:2218(A) attached to and made a part of this bid.

\*\*\* **W-9** – If a vendor has not done business with the Parish, the vendor should submit an updated W-9 with their response.

## LOUISIANA UNIFORM PUBLIC WORK BID FORM

### UNIT PRICE FORM

**TO:**

St. Tammany Parish Government

21454 Koop Drive, Suite 2F

Mandeville, LA., 70471

*(Owner to provide name and address of owner)*

**BID FOR:**

Cross Gates Water System

New Elevated Water Storage Tanks

Bid. No 23-3-2

*(Owner to provide name of project and other identifying information)*

**UNIT PRICES:** This form shall be used for any and all work required by the Bidding Documents and described as unit prices. Amounts shall be stated in figures and only in figures.

DESCRIPTION:	<input checked="" type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ___ WILLOW WOOD MOBILIZATION (TU 22000204)			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION ( <i>Quantity times Unit Price</i> )
1	1	LS		
DESCRIPTION:	<input checked="" type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ___ CONSTRUCT WILLOW WOOD 400,000 GALLON TANK & IMPROVEMENTS (TU 22000204)			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION ( <i>Quantity times Unit Price</i> )
2	1	LS		
DESCRIPTION:	<input checked="" type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ___ WILLOW WOOD DISINFECTION (TU 22000204)			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION ( <i>Quantity times Unit Price</i> )
3	1	LS		
DESCRIPTION:	<input checked="" type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ___ WILLOW WOOD EQUIPMENT STARTUP (TU 22000204)			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION ( <i>Quantity times Unit Price</i> )
4	1	LS		

DESCRIPTION:	<input checked="" type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ___ OZONE PINES MOBILIZATION (TU 22000209)			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION ( <i>Quantity times Unit Price</i> )
5	1	LS		
DESCRIPTION:	<input checked="" type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ___ CONSTRUCT OZONE PINES 400,000 GALLON TANK & IMPROVEMENTS (TU 22000209)			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION ( <i>Quantity times Unit Price</i> )
6	1	LS		
DESCRIPTION:	<input checked="" type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ___ OZONE PINES DISINFECTION (TU 22000209)			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION ( <i>Quantity times Unit Price</i> )
7	1	LS		
DESCRIPTION:	<input checked="" type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ___ OZONE PINES EQUIPMENT STARTUP (TU 22000209)			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION ( <i>Quantity times Unit Price</i> )
8	1	LS		
DESCRIPTION:	<input checked="" type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# <u>2</u> ___ OZONE PINES TIE-IN TO EXISTING WATERLINE (TU 22000209)			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION ( <i>Quantity times Unit Price</i> )
9	1	LS		
DESCRIPTION:	<input type="checkbox"/> Base Bid or <input checked="" type="checkbox"/> Alt.# <u>1</u> ___ DEDUCT FOR CONSTRUCT WILLOW WOOD 300,000 GALLON TANK & IMPROVEMENTS (TU 22000204)			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION ( <i>Quantity times Unit Price</i> )
10	1	LS		
DESCRIPTION:	<input type="checkbox"/> Base Bid or <input checked="" type="checkbox"/> Alt.# <u>2</u> ___ DEDUCT FOR CONSTRUCT OZONE PINES 300,000 GALLON TANK & IMPROVEMENTS (TU 22000209)			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION ( <i>Quantity times Unit Price</i> )
11	1	LS		

**All quantities are estimated. The contractor will be paid based upon actual quantities as verified by the Owner.**

**Section 05**

**AFFIDAVIT PURSUANT TO LSA-R.S. 38:2224 and 38:2227  
FOR BIDDERS FOR PUBLIC WORKS CONTRACTS**

**STATE OF** \_\_\_\_\_

**PARISH/COUNTY OF** \_\_\_\_\_

**BEFORE ME**, the undersigned authority, in and for the above stated State and Parish (or County), personally came and appeared:

\_\_\_\_\_

Print Name

who, after first being duly sworn, did depose and state:

1. That affiant is appearing on behalf of \_\_\_\_\_, who is seeking a public contract with St. Tammany Parish Government.
  
2. That affiant employed no person, corporation, firm, association, or other organization, either directly or indirectly, to secure the public contract under which he received payment, other than persons regularly employed by the affiant whose services in connection with the construction, alteration or demolition of the public building or project or in securing the public contract were in the regular course of their duties for affiant; and
  
3. That no part of the contract price received by affiant was paid or will be paid to any person, corporation, firm, association, or other organization for soliciting the contract, other than the payment of their normal compensation to persons regularly employed by the affiant whose services in connection with the construction, alteration or demolition of

the public building or project were in the regular course of their duties for affiant.

4. If affiant is a sole proprietor, that after July 2, 2010, he/she has not been convicted of, or has not entered a plea of guilty or *nolo contendere* to any of the crimes or equivalent federal crimes listed in LSA-R.S. 38:2227(B).
5. If affiant is executing this affidavit on behalf of a juridical entity such as a partnership, corporation, or LLC, etc., that no individual partner, incorporator, director, manager, officer, organizer, or member, who has a minimum of a ten percent ownership in the bidding entity, has been convicted of, or has entered a plea of guilty or *nolo contendere* to any of the crimes or equivalent federal crimes listed in LSA-R.S. 38:2227(B).
6. If affiant is a sole proprietor, that neither affiant, nor his/her immediate family is a public servant of St. Tammany Parish Government or the Contract is not under the supervision or jurisdiction of the public servant's agency.
7. If affiant is executing this affidavit on behalf of a juridical entity such as a partnership, corporation, or LLC, etc., that no public servant of St. Tammany Parish Government, or his/her immediate family, either individually or collectively, has more than a 25% ownership interest in the entity seeking the Contract with St. Tammany Parish Government if the Contract will be under the supervision or jurisdiction of the public servant's agency.



\_\_\_\_\_  
**Printed Name:** \_\_\_\_\_

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

**Entity name:** \_\_\_\_\_

**THUS SWORN TO AND SUBSCRIBED BEFORE ME,  
THIS \_\_\_\_\_, DAY OF \_\_\_\_\_, 202\_\_.**

\_\_\_\_\_  
**Notary Public**

**Print Name:** \_\_\_\_\_

**Notary I.D./Bar No.:** \_\_\_\_\_

**My commission expires:** \_\_\_\_\_

**AFFIDAVIT PURSUANT TO LSA-R.S. 38:2212.10 CONFIRMING  
REGISTRATION AND PARTICIPATION IN A STATUS VERIFICATION  
SYSTEM**

**STATE OF** \_\_\_\_\_

**PARISH/COUNTY OF** \_\_\_\_\_

**BEFORE ME**, the undersigned authority, in and for the above stated State and Parish (or County), personally came and appeared:

\_\_\_\_\_

Print Name

who, after first being duly sworn, did depose and state:

1. That affiant is appearing on behalf of \_\_\_\_\_, a private employer seeking a bid or a contract with St. Tammany Parish Government for the physical performance of services within the State of Louisiana.
  
2. That affiant is registered and participates in a status verification system to verify that all employees in the state of Louisiana are legal citizens of the United States or are legal aliens; and
  
3. That affiant shall continue, during the term of the contract, to utilize a status verification system to verify the legal status of all new employees in the state of Louisiana.
  
4. That affiant shall require all subcontractors to submit to the affiant a sworn affidavit verifying compliance with this law.

\_\_\_\_\_  
**Printed Name:** \_\_\_\_\_

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

**Name of Entity:** \_\_\_\_\_

**THUS SWORN TO AND SUBSCRIBED BEFORE ME,  
THIS \_\_\_\_\_, DAY OF \_\_\_\_\_, 202\_\_.**

\_\_\_\_\_  
**Notary Public**

**Print Name:** \_\_\_\_\_

**Notary I.D./Bar No.:** \_\_\_\_\_

**My commission expires:** \_\_\_\_\_



## INSURANCE REQUIREMENTS\*

Construction Project: Cross Gates water System New Elevated Storage Tanks  
Project/Quote/Bid#: 23-3-2

### **\*\*\*IMPORTANT – PLEASE READ\*\*\***

**Prior to submitting your quote or bid, it is recommended that you review these insurance requirements with your insurance broker/agent.**

*These requirements modify portions of the insurance language found in the General Conditions and/or Supplementary General Conditions; however, there is no intention to remove all sections pertaining to insurance requirements and limits set forth in the General Conditions and/or Supplementary General Conditions, only to amend and specify those items particular for this Project.*

- A. The Provider shall secure and maintain at its expense such insurance that will protect it and St. Tammany Parish Government (the "Parish") from claims for bodily injury, death or property damage as well as from claims under the Workers' Compensation Acts that may arise from the performance of services under this agreement. All certificates of insurance shall be furnished to the Parish and provide thirty (30) days prior notice of cancellation to the Parish, in writing, on all of the required coverage.
- B. All policies shall provide for and certificates of insurance shall indicate the following:
1. Waiver of Subrogation: The Provider's insurers will have no right of recovery or subrogation against the Parish of St. Tammany, it being the intention of the parties that all insurance policy(ies) so affected shall protect both parties and be the primary coverage for any and all losses covered by the below described insurance.
  2. Additional Insured: St. Tammany Parish Government shall be named as Additional Insured with respect to general liability, automobile liability and excess liability coverages, as well as marine liability and pollution/environmental liability, when those coverages are required or necessary.
  3. Payment of Premiums: The insurance companies issuing the policy or policies will have no recourse against St. Tammany Parish Government for payment of any premiums or for assessments under any form of policy.
  4. Project Reference: The project(s) and location(s) shall be referenced in the Comment or Description of Operations section of the Certificate of Insurance (Project ##-###, or Bid # if applicable, Type of Work, Location).
- C. Coverage must be issued by insurance companies authorized to do business in the State of Louisiana. Companies must have an A.M. Best rating of no less than A-, Category VII. St. Tammany Parish Risk Management Department may waive this requirement only for Workers Compensation coverage at their discretion.

Provider shall secure and present proof of insurance on forms acceptable to St. Tammany Parish Government, Office of Risk Management no later than the time of submission of the Contract to the Parish. However, should any work performed under this Contract by or on behalf of Provider include exposures that are not covered by those insurance coverages, Provider is not relieved of its obligation to maintain appropriate levels and types of insurance necessary to protect itself, its agents and employees, its subcontractors, St. Tammany Parish Government (Owner), and all other interested third parties, from any and all claims for damage or injury in connection with the services performed or provided throughout the duration of this Project, as well as for any subsequent periods required under this Contract.

The insurance coverages checked (✓) below are those required for this Contract.

- 1. **Commercial General Liability\*** insurance – **Occurrence Form** - with a Combined Single Limit for bodily injury and property damage of at least \$2,000,000 per Occurrence / \$4,000,000 General Aggregate and \$2,000,000 Products-Completed Operations. Contracts over \$1,000,000 may require higher limits. The insurance shall provide for and the certificate(s) of insurance shall indicate the following coverages:
  - a) Premises - operations;
  - b) Broad form contractual liability;
  - c) Products and completed operations;
  - d) Personal/Advertising Injury;
  - e) Broad form property damage (for Projects involving work on Parish property);
  - f) Explosion, Collapse and Damage to underground property.
  - g) Additional Insured forms CG 2010 and CG 2037 in most current edition are required.
  
- 2. **Business Automobile Liability\*** insurance with a Combined Single Limit of \$1,000,000 per Occurrence for bodily injury and property damage, and shall include coverage for the following:
  - a) Any auto;
  - or**
  - b) Owned autos; **and**
  - c) Hired autos; **and**
  - d) Non-owned autos.
  
- 3. **Workers' Compensation/Employers Liability insurance\*** - Workers' Compensation coverage as required by State law. Employers' liability limits shall be a minimum of \$1,000,000 each accident, \$1,000,000 each disease, \$1,000,000 disease policy aggregate. When water activities are expected to be performed in connection with this project, coverage under the USL&H Act, Jones Act and/or Maritime Employers Liability (MEL) must be included. **Coverage for owners, officers and/or partners in any way engaged in the Project shall be included in the policy.** The names of any excluded individual must be shown in the Description of Operations/Comments section of the Certificate.
  
- 4. **Pollution Liability and Environmental Liability\*** insurance in the minimum amount of \$1,000,000 per occurrence / \$2,000,000 aggregate including full contractual liability and third party claims for bodily injury and/or property damage, for all such hazardous waste, pollutants and/or environmental exposures that may be affected by this project stemming from pollution/environmental incidents as a result of Contractor's operations.

If coverage is provided on a claims-made basis, the following conditions apply:

- 1) the retroactive date must be prior to or coinciding with the effective date of the Contract, or prior to the commencement of any services provided by the Contractor on behalf of the Parish, whichever is earlier; AND
- 2) continuous coverage must be provided to the Parish with the same retro date for 24 months following acceptance or termination of the Project by the Parish either by
  - a) continued renewal certificates **OR**
  - b) a 24 month Extended Reporting Period

\*The Certificate must indicate whether the policy is written on an occurrence or claims-made basis and, if claims-made, the applicable retro date must be stated.

5. **Contractor's Professional Liability/Errors and Omissions\*** insurance in the sum of at least \$1,000,000 per claim / \$2,000,000 aggregate is required when work performed by Contractor or on behalf of Contractor includes professional or technical services including, but not limited to, construction administration and/or management, engineering services such as design, surveying, and/or inspection, technical services such as testing and laboratory analysis, and/or environmental assessments. An occurrence basis policy is preferred.

If coverage is provided on a claims-made basis, the following conditions apply:

- 1) the retroactive date must be prior to or coinciding with the effective date of the Contract, or prior to the commencement of any services provided by the Contractor on behalf of the Parish, whichever is earlier; AND
- 2) continuous coverage must be provided to the Parish with the same retro date for 24 months following acceptance or termination of the Project by the Parish either by
  - a) continued renewal certificates **OR**
  - b) a 24 month Extended Reporting Period

\*The Certificate must indicate whether the policy is written on an occurrence or claims-made basis and, if claims-made, the applicable retro date must be stated.

6. **Marine Liability/Protection and Indemnity\*** insurance is required for any and all vessel and/or marine operations in the minimum limits of \$1,000,000 per occurrence / \$2,000,000 per project general aggregate. The coverage shall include, but is not limited to, the basic coverages found in the Commercial General Liability insurance and coverage for third party liability

**\*Excess/Umbrella Liability** insurance may be provided to meet the limit requirements for any Liability coverage. For example: if the General Liability requirement is \$3,000,000 per occurrence, but the policy is only \$1,000,000 per occurrence, then the excess policy should be at least \$2,000,000 per occurrence thereby providing a combined per occurrence limit of \$3,000,000.)

7. **Owners Protective Liability (OPL)** shall be furnished by the Contractor and shall provide coverage in the minimum amount of \$3,000,000 CSL each occurrence / \$3,000,000 aggregate. **St. Tammany Parish Government, ATTN: Risk Management Department, P. O. Box 628, Covington, LA 70434 shall be the first named insured on the policy.**

8. **Builder's Risk Insurance** written on an "all-risk" policy form shall be furnished by Contractor for 100% of the contract cost. Any contract modifications increasing the contract cost will require an increase in the limit of the Builder's Risk policy. Deductibles should not exceed \$5,000 and Contractor shall be responsible for all policy deductibles. This insurance shall cover materials at the site, stored off the site, and in transit. The Builder's Risk Insurance shall include the interests of the Owner, Contractor and Subcontractors and shall terminate only when the Project is accepted in writing. **St. Tammany Parish Government, ATTN: Risk Management Department, P. O. Box 628, Covington, LA 70434 shall be the first named insured on the policy.**

9. **Installation Floater Insurance**, on an "all-risk" form, shall be furnished by Contractor and carried for the full value of the materials, machinery, equipment and labor for each location. The Contractor shall be responsible for all policy deductibles. The Installation Floater Insurance shall provide coverage for property owned by others and include the interests of the Owner, Contractor and Subcontractors and shall terminate only when the Project is accepted in writing. **St. Tammany Parish Government, ATTN: Risk Management Department, P. O. Box 628, Covington, LA 70434 shall be the first named insured on the policy.**

- D. All policies of insurance shall meet the requirements of the Parish prior to the commencing of any work. The Parish has the right, but not the duty, to approve all insurance coverages prior to commencement of work. If any of the required policies are or become unsatisfactory to the Parish as to form or substance; or if a company issuing any policy is or becomes unsatisfactory to the Parish, the Provider shall promptly obtain a new policy, timely submit same to the Parish for approval, and submit a certificate thereof as provided above. The Parish agrees not to unreasonably withhold approval of any insurance carrier selected by Provider. In the event that Parish cannot agree or otherwise authorize a carrier, Provider shall have the option of selecting and submitting a new insurance carrier within 30 days of said notice by the Parish. In the event that the second submission is insufficient or is not approved, then the Parish shall have the unilateral opportunity to thereafter select a responsive and responsible insurance carrier all at the cost of Provider and thereafter deduct from Provider's fee the cost of such insurance.
- E. Upon failure of Provider to furnish, deliver and/or maintain such insurance as above provided, this contract, at the election of the Parish, may be declared suspended, discontinued or terminated. Failure of the Provider to maintain insurance shall not relieve the Provider from any liability under the contract, nor shall the insurance requirements be construed to conflict with the obligation of the Provider concerning indemnification.
- F. Provider shall maintain a current copy of all annual insurance policies and agrees to provide a certificate of insurance to the Parish on an annual basis or as may be reasonably requested for the term of the contract or any required Extended Reporting Period. Provider further shall ensure that all insurance policies are maintained in full force and effect throughout the duration of the Project and shall provide the Parish with annual renewal certificates of insurance evidencing continued coverage, without any prompting by the Parish.
- G. It shall be the responsibility of Provider to require that these insurance requirements are met by all contractors and sub-contractors performing work for and on behalf of Provider. Provider shall further ensure the Parish is named as an additional insured on all insurance policies provided by said contractor and/or sub-contractor throughout the duration of the project.
- H. Certificates of Insurance shall be issued as follows:

**St. Tammany Parish Government  
Attn: Risk Management  
P O Box 628  
Covington, LA 70434**

To avoid contract processing delays, be certain the project name/number is included on all correspondence including Certificates of Insurance.

**\*NOTICE: St. Tammany Parish Government reserves the rights to remove, replace, make additions to and/or modify any and all of the insurance requirements at any time.**

**Any inquiry regarding these insurance requirements should be addressed to:**

**St. Tammany Parish Government  
Office of Risk Management  
P O Box 628  
Covington, LA 70434  
Telephone: 985-898-5226  
Email: riskman@stpgov.org**

## Section 07

### Project Signs

#### 1. General

- a. Work to include providing and installing two (2) project sign(s) at the beginning of the project. Should more than one sign be required, it will be reflected in the bidding documents.

#### 2. Materials

- a. The printed project sign(s) shall be 3/8" primed Medium Density Overlay (MDO) **OR** 3-millimeter corrugated plastic secured to exterior plywood (4' x 4').
- b. Contractor shall not use previously provided templates and/or fonts.

#### 3. Execution

- a. The sign(s) shall be printed on a project-by-project basis in black and white, using the template and font provided to the Contractor by the St. Tammany Parish Government Project Manager.
- b. All signage proofed and approved by State Tammany Parish Government before project sign(s) are to be produced by the Contractor.
- c. Exact placement of the project sign(s) must be coordinated with, and approved by, the St. Tammany Parish Government Project Manager prior to sign installation.
- d. The sign(s) is to be installed such that the bottom of the sign is a minimum of 5' above the existing ground elevation.
- e. Sign(s) is to be maintained throughout the period of construction. If sign(s) is damaged or destroyed, repair and/or replacement of sign(s) will be at Contractor's expense.
- f. Contractor is responsible for the removal of all project signs upon issuance of final acceptance by the St. Tammany Parish Government Project Manager at no direct pay.
- g. Cost to be included in "Mobilization" bid items, No. 1 (Willow Wood), and No. 5 (Ozone Pines).



**Blank Template of Parish Project Sign:**

# PROGRESS



**MICHAEL B. COOPER**  
Parish President

\_\_\_\_\_  
Councilmember Name  
Council District X

Total Dollar \$  
amount specified

**\$XXX,XXX.XX**

**Project Name**

Description of  
Project Work

Name of Street, Bridge,  
Subdivision, etc. stated

Short Description of Project stated  
here

**Example of a Completed Parish Project Sign:**

# PROGRESS



**MICHAEL B. COOPER**  
Parish President

**RYKERT O. TOLEDANO, JR**  
Council District 5

**\$514,444.40**

**Dove Park**  
**Subdivision Drainage**  
Drainage Improvements along  
Swallow St., Sparrow St.,  
Partridge St. and Egret St.

**Section 08**

**General Conditions for St. Tammany Parish Government**

**This index is for illustrative purposes only and is not intended to be complete nor exhaustive.**

**All bidders/contractors are presumed to have read and understood the entire document. Some information contained in these conditions may not be applicable to all projects.**

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## 01.00 DEFINITIONS OF TERMS

Whenever used in these General Conditions or in other Contract Documents, the following terms shall have the meanings indicated, and these shall be applicable to both the singular and plural thereof.

- 01.01 A.A.S.H.T.O American Association of State Highway and Transportation Officials. When A.A.S.H.T.O. is referred to in these Specifications it takes the meaning of the specification for materials and methods of testing specified by this association and the specification stated is considered to be a part of the Specifications as if written herein in full.
- 01.02 A.C.I American Concrete Institute. When A.C.I. is referred to in these Specifications it takes the meaning of the specification for materials and methods of testing specified by this institute and the specification stated is considered to be a part of the Specifications as if written herein in full.
- 01.03 Addenda Written or graphic instruments issued prior to the opening of bids which clarify, correct, modify or change the bidding or Contract Documents.
- 01.04 Advertisement The written instrument issued by the Owner at the request of the Owner used to notify the prospective bidder of the nature of the Work. It becomes part of the Contract Documents.
- 01.05 Agreement The written agreement or contract between the Owner and the Contractor covering the Work to be performed and the price that the Owner will pay. Other documents, including the Proposal, Addenda, Specifications, plans, surety, insurance, etc., are made a part thereof.
- 01.06 Application for Payment The form furnished by the Owner which is to be used by the Contractor in requesting incremental (progress) payments and which is to include information required by Section 28.01 and an affidavit of the Contractor. The affidavit shall stipulate that progress payments theretofore received from the Owner on account of the Work have been applied by Contractor to discharge in full of all Contractor's obligations reflected in prior applications for payment.
- 01.07 A.S.T.M. American Society of Testing Materials. When A.S.T.M. is referred to in these Specifications it takes the meaning of the specification for materials and methods of testing specified by this society and the specification stated is considered to be a part of the Specifications as if written herein in full.
- 01.08 Bid The offer or Proposal of the Bidder submitted on the prescribed form setting forth all the prices for the Work to be performed.
- 01.09 Bidder Any person, partnership, firm or corporation submitting a Bid for the Work.

- 01.10 Bonds Bid, performance and payment bonds and other instruments of security, furnished by the Contractor and its surety in accordance with the Contract Documents and Louisiana law.
- 01.11 Change Order A written order to the Contractor signed by the Owner authorizing an addition, deletion or revision in the Work, or an adjustment in the Contract Price or the Contract Time after execution of the Agreement.
- 01.12 Contract Documents The Agreement, Addenda, Contractor's Bid and any documentation accompanying or post-bid documentation when attached as an exhibit, the Bonds, these General Conditions, the Advertisement for Bid, Notice to Contractor, all supplementary conditions, the Specifications, the Drawings, together with all Modifications issued after the execution of the Agreement.
- 01.13 Contract Price The total monies payable to the Contractor under the Contract Documents.
- 01.14 Contract Time The number of consecutive calendar days stated in the Agreement for the completion of the Work.
- 01.15 Contractor The person, firm, corporation or provider with whom the Owner has executed the Agreement.
- 01.16 Defective Work When work which is unsatisfactory, faulty or deficient for any reason whatsoever, or does not conform to the Contract Documents, or does not meet the requirements of any inspection, test or approval referred to in the Contract Documents, or has been damaged prior to the Owner's recommendation or acceptance.
- 01.17 Drawings The Drawings and plans which show the character and scope of the Work to be performed and which have been prepared or approved by the Owner and are referred to in the Contract Documents.
- 01.18 Field Order A written order issued by the Owner or his agent which clarifies or interprets the Contract Documents.
- 01.19 Modification (a) A written amendment of the Contract Documents signed by both parties, (b) A Change Order, (c) A written clarification or interpretation issued by the Owner or his agent. Modification may only be issued after execution of the Agreement.
- 01.20 Notice of Award The written notice by Owner to the lowest responsible Bidder stating that upon compliance of the conditions enumerated in the Notice of Award, or enumerated in the Bid documents, the Owner will deliver the Contract Documents for signature. The time for the delivery of the Contract Documents can be extended in conformance with Louisiana Law.

- 01.21 Notice to Contractor Instructions, written or oral given by Owner to Contractor and deemed served if given to the Contractor's superintendent, foreman or mailed to Contractor at his last known place of business.
- 01.22 Notice to Proceed A written notice given by the Owner fixing the date on which the Contract Time will commence, and on which date the Contractor shall start to perform his obligation under the Contract Documents. Upon mutual consent by both parties, the Notice to Proceed may be extended.
- 01.23 Owner St. Tammany Parish Government, acting herein through its duly constituted and authorized representative, including but not limited to the Office of the Parish President or its designee, its Chief Administrative Officer, and/or Legal Counsel. St. Tammany Parish Government (hereinafter, the "Parish") and Owner may be used interchangeably.
- 01.24 Project The entire construction to be performed as provided in the Contract Documents.
- 01.25 Project Representative The authorized representative of the Owner who is assigned to the Project or any parts thereof.
- 01.26 Proposal The Bid submitted by the Bidder to the Owner on the Proposal form setting forth the Work to be done and the price for which the Bidder agrees to perform the Work.
- 01.27 Shop Drawings All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the Contractor, Subcontractor, Manufacturer, Supplier or Distributor and which illustrate the equipment, material or some portion of the Work.
- 01.28 Specifications The Instructions to Bidders, these General Conditions, the Special Conditions and the Technical Provisions. All of the documents listed in the "Table of Contents."
- 01.29 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 Project Work.
- 01.30 Substantial Completion The date as certified by the Owner or its agent when the construction of the Project or a specified part thereof is sufficiently complete in accordance with the Contract Documents so that the Project or specified part can be utilized for the purposes for which it was intended; or if there is no such certification, the date when final payment is due in accordance with Section 28.
- 01.31 Superintendent Contractor's site representative. The person on the site who is in full and complete charge of the Work.
- 01.32 Time Unless specifically stated otherwise, all time delays shall be calculated in calendar days.

01.33 Work Any and all obligations, duties and responsibilities necessary to the successful completion of the Project assigned to or undertaken by the Contractor under the Contract Documents, usually including the furnishing of all labor, materials, equipment and other incidentals.

01.34 The terms “he/himself” may be used interchangeably with “it/itself.”

## 02.00 PROPOSAL

02.01 All papers bound with or attached to the Proposal Form are a necessary part thereof and must not be detached.

02.02 For submitting Bids, the only forms allowed shall be the “Louisiana Uniform Public Work Bid Form”, “Louisiana Uniform Public Works Bid Form Unit Price Form” (if necessary), the Bid Bond, and written evidence of authority of person signing the bid. Necessary copies of the Louisiana Uniform Public Work Forms will be furnished for Bidding. Bound sets of the Contract Documents are for Bidder's information and should not be used in submitting Bids.

02.03 Proposal forms must be printed in ink or typed, unless submitted electronically. Illegibility or ambiguity therein may constitute justification for rejection of the Bid.

02.04 Each Bid must be submitted in a sealed envelope, unless submitted electronically. The outside of the envelope shall show the name and address of the Bidder, the State Contractor’s License Number of the Bidder (if work requires contractor’s license), and the Project name and number for which the Bid is submitted, along with the Bid number.

02.05 The price quoted for the Work shall be stated in words and figures on the Bid Form, and in numbers only on the Unit Price Form. The price in the Proposal shall include all costs necessary for the complete performance of the Work in full conformity with the conditions of the Contract Documents, and shall include all applicable Federal, State, Parish, Municipal or other taxes. The price bid for the items listed on the Unit Price Form will include the cost of all related items not listed, but which are normally required to do the type of Work bid.

02.06 The Bid shall be signed by the Bidder. The information required on the Louisiana Uniform Public Work Bid Form must be provided. Evidence of agency, corporate, or partnership authority is required and shall be provided in conformance with LSA-R.S. 38:2212(B).

02.07 Only the Contractors licensed by the State to do the type of Work involved can submit a Proposal for the Work. The envelope containing the Proposal shall have the Contractor's license number on it. Failure to be properly licensed constitutes authority by the Owner for rejection of Bid.

- 02.08 Bidders shall not attach any conditions or provisions to the Proposal. Any conditions or provisions so attached may, at the sole option of the Owner, cause rejection of the Bid or Proposal.
- 02.09 A Bid Guarantee of five percent (5%) of the amount of the total Bid, including Alternates, must accompany the Proposal and, at the option of the Bidder, may be a cashier's check, certified check or a satisfactory Bid Bond. The Bid Guarantee must be attached to the Louisiana Uniform Public Work Bid Form. No Bid will be considered unless it is so guaranteed. Cashier's check or certified check must be made payable to the order of the Owner. Cash deposits will not be accepted. The Owner reserves the right to cash or deposit the cashier's check or certified check. Such guarantees shall be made payable to the Parish of St. Tammany. In accordance with LSA-R.S. 38:2218(C), if a bid bond is used, it shall be written by a surety or insurance company currently on the U.S. Department of the Treasury Financial Management Service list of approved bonding companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an A- rating in the latest printing of the A.M. Best's Key Rating Guide to write individual bonds up to ten percent of policyholders' surplus as shown in the A.M. Best's Key Rating Guide, or by an insurance company in good standing licensed to write bid bonds which is either domiciled in Louisiana or owned by Louisiana residents. It is **not** required to be on any AIA form.
- 02.10 Bid securities of the three (3) lowest Bidders will be retained by the Owner until the Contract is executed or until final disposition is made of the Bids submitted. Bid securities of all other Bidders will be returned promptly after the canvas of Bids. Bids shall remain binding for forty-five (45) days after the date set for Bid Opening. The Parish shall act within the forty-five (45) days to award the contract to the lowest responsible bidder or reject all bids as permitted by Public Bid Law. However, the Parish and the lowest responsible bidder, by mutual written consent, may agree to extend the deadline for award by one or more extensions of thirty (30) calendar days. In the event the Owner issued the Letter of Award during this period, or any extension thereof, the Bid accepted shall continue to remain binding until the Execution of the Contract.
- 02.11 A Proposal may be withdrawn at any time prior to the scheduled closing time for receipt of Bids, provided the request is in writing, executed by the Bidder or its duly authorized representative and is filed with the Owner prior to that time. When such a request is received, the Proposal will be returned to the Bidder unopened.
- 02.12 Written communications, over the signature of the Bidder, to modify Proposals will be accepted and the Proposal corrected in accordance therewith if received by the Owner prior to the scheduled closing time for receipt of Bids. Oral, telephonic or telegraphic Modifications will not be considered.
- 02.13 No oral interpretation obligating the Owner will be made to any Bidder as to the meaning of the Drawings, Specifications and Contract Documents. Every request for such an interpretation shall be made in writing and addressed and forwarded to the Owner. No inquiry received within seven (7) days prior to the day fixed for opening of the Bids shall

be given consideration. Every interpretation made to the Bidder shall be in the form of an addendum to the Specifications. All such Addenda shall become part of the Contract Documents. Failure of Bidder to receive any such interpretation shall not relieve any Bidder from any obligation under this Bid. All Addenda shall be issued in accordance with the Public Bid Law, LSA-R.S. 38:2212(O)(2)(a) and (b).

- 02.14 The Owner reserves the right to reject any or all Bids for just cause in accordance with the Public Bid Law, LSA-R.S. 38:2214(B). Incomplete, informal or unbalanced Bids may be rejected. Reasonable grounds for belief that any one Bidder is concerned directly or indirectly with more than one Bid will cause rejection of all Bids wherein such Bidder is concerned. If required, a Bidder shall furnish satisfactory evidence of its competence and ability to perform the Work stipulated in its Proposal. Incompetence will constitute cause for rejection. If the Parish determines that the bidder is not responsive or responsible for any reason whatsoever, the bid may be rejected in accordance with State law.
- 02.15 The Contractor shall indemnify and hold harmless the Owner from any and all suits, costs, penalties or claims for infringement by reason of use or installation of any patented design, device, material or process, or any trademark and copyright in connection with the Work agreed to be performed under this Contract, and shall indemnify and hold harmless the Owner for any costs, expenses and damages which it may be obliged to pay by reason of any such infringement at any time during the prosecution or after completion of the Work.
- 02.16 Bidders shall familiarize themselves with and shall comply with all applicable Federal and State Laws, municipal ordinances and the rules and regulations of all authorities having jurisdiction over construction of the Project, which may directly or indirectly affect the Work or its prosecution. These laws and/or ordinances will be deemed to be included in the Contract, as though herein written in full.
- 02.17 Each Bidder shall visit the site of the proposed Work and fully acquaint itself with all surface and subsurface conditions as they may exist so that it may fully understand this Contract. Bidder shall also thoroughly examine and be familiar with drawings, Specifications and Contract Documents. The failure or omission of any Bidder to receive or examine any form instrument, Drawing or document or to visit the site and acquaint itself with existing conditions, shall in no way relieve any Bidder from any obligation with respect to its Bid and the responsibility in the premises.
- 02.18 The standard contract form enclosed with the Proposal documents is a prototype. It is enclosed with the Contract Documents for the guidance of the Owner and the Contractor. It has important legal consequences in all respects and consultation with an attorney is encouraged. Contractor shall be presumed to have consulted with its own independent legal counsel.
- 02.19 When one set of Contract plans show the Work to be performed by two or more prime Contractors, it is the responsibility of each Bidder to become knowledgeable of the Work to be performed by the other where the Work upon which this bid is submitted is shown to come into close proximity or into conflict with the Work of the other. In avoiding conflicts,



pressure pipe lines must be installed to avoid conflict with gravity pipe lines and the Bidder of the smaller gravity pipe line in conflict with the larger gravity pipe line must include in his Bid the cost of a conflict box at these locations. The location of and a solution to the conflicts do not have to be specifically noted as such on the plans.

- 02.20 Bidder shall execute affidavit(s) attesting compliance with LSA-R.S. 38:2212.10, 38:2224, 38:2227, each as amended, and other affidavits as required by law, prior to execution of the contract.
- 02.21 Sealed Proposals (Bid) shall be received by St. Tammany Parish Government at the office of St. Tammany Parish Government, Department of Procurement, 21454 Koop Drive, Suite 2-F, Mandeville, LA 70471, until the time and date denoted in Notice to Bidders, at which time and place the Proposals (Bids), shall be publicly opened and read aloud to those present. In accordance with LSA-R.S. 38-2212(A)(3)(c)(i), the designer's final estimated cost of construction shall be read aloud upon opening bids. Sealed Proposals (Bids) may also be mailed by certified mail to St. Tammany Parish Government, Department of Procurement, 21454 Koop Drive, Suite 2-F, Mandeville, LA 70471, and must be received before the bid opening. Bids may also be submitted electronically. Information concerning links for electronic bidding is contained in the Notice to Bidders.
- 02.22 Proposals (Bids) shall be executed on Forms furnished and placed in a sealed envelope, marked plainly and prominently as indicated in the Notice to Bidders, and these General Conditions, and addressed:

St. Tammany Parish Government  
Department of Procurement  
21454 Koop Drive, Suite 2-F  
Mandeville, LA 70471

- 02.23 Complete sets of Drawings, Specifications, and Contract Documents may be secured at the Office of the Owner. See Notice to Bidders for deposit schedule.
- 02.24 The successful bidder shall be required to post in each direction a public information sign, 4' x 8' in size, at the location of the project containing information required by the Owner. The Owner shall supply this information.
- 03.00 AWARD, EXECUTION OF DOCUMENTS, BONDS, ETC.
- 03.01 The award of the Contract, if it is awarded, will be to the lowest responsible Bidder, in accordance with State Law. No award will be made until the Owner has concluded such investigations as it deems necessary to establish the responsibility, qualifications and financial ability and stability of the Bidder to do the Work in accordance with the Contract Documents to the satisfaction of the Owner within the time prescribed as established by the Department based upon the amount of work to be performed and the conditions of same. The written contract and bond shall be issued in conformance with LSA-R.S.

38:2216. The Owner reserves the right to reject the Bid of any Bidder in accordance with the Public Bid Law, LSA-R.S. 38:2214. If the Contract is awarded, the Owner shall give the successful Bidder written notice of the award within forty-five (45) calendar days after the opening of the Bids in conformance with LSA-R.S. 38:2215(A), or any extension as authorized thereunder.

- 03.02 At least three counterparts of the Agreement and of such other Contract Documents as practicable shall be signed by the Owner and the Contractor. The Owner shall identify those portions of the Contract Documents not so signed and such identification shall be binding on both parties. The Owner and the Contractor shall each receive an executed counterpart of the Contract Documents.
- 03.03 Prior to the execution of the Agreement, the Contractor shall deliver to the Owner the required Bonds.
- 03.04 Failure of the successful Bidder to execute the Agreement and deliver the required Bonds within twenty (20) days of the Notice of the Award shall be just cause for the Owner to annul the award and declare the Bid and any guarantee thereof forfeited.
- 03.05 In order to ensure the faithful performance of each and every condition, stipulation and requirement of the Contract and to indemnify and save harmless the Owner from any and all damages, either directly or indirectly arising out of any failure to perform same, the successful Bidder to whom the Contract is awarded shall furnish a surety Bond in an amount of at least equal to one hundred percent (100%) of the Contract Price. The Contract shall not be in force or binding upon the Owner until such satisfactory Bond has been provided to and approved by the Parish. The cost of the Bond shall be paid for by the Contractor unless otherwise stipulated in the Special Provisions.
- 03.06 No surety Company will be accepted as a bondsman who has no permanent agent or representative in the State upon whom notices referred to in the General Conditions of these Specifications may be served. Services of said notice on said agent or representative in the State shall be equal to service of notice on the President of the Surety Company, or such other officer as may be concerned.
- 03.07 In conformance with LSA-R.S. 38:2219(A)(1)(a), (b), and (c):

Any surety bond written for a public works project shall be written by a surety or insurance company currently on the U.S. Department of the Treasury Financial Management Service list of approved bonding companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an A- rating in the latest printing of the A.M. Best's Key Rating Guide, to write individual bonds up to ten percent of policyholders' surplus as shown in the A.M. Best's Key Rating Guide or by an insurance company that is either domiciled in Louisiana or owned by Louisiana residents and is licensed to write surety bonds.

For any public works project, no surety or insurance company shall write a bond which is in excess of the amount indicated as approved by the U.S. Department of the Treasury Financial Management Service list or by a Louisiana domiciled insurance company with an A- rating by A.M. Best up to a limit of ten percent of policyholders' surplus as shown by A.M. Best; companies authorized by this Paragraph who are not on the treasury list shall not write a bond when the penalty exceeds fifteen percent of its capital and surplus, such capital and surplus being the amount by which the company's assets exceed its liabilities as reflected by the most recent financial statements filed by the company with the Department of Insurance.

In addition, any surety bond written for a public works project shall be written by a surety or insurance company that is currently licensed to do business in the state of Louisiana. All contractors must comply with any other applicable provisions of LSA-R.S. 38:2219.

- 03.08 Should the Contractor's Surety, even though approved and accepted by the Owner, subsequently remove its agency or representative from the State or become insolvent, bankrupt, or otherwise fail, the Contractor shall immediately furnish a new Bond in another company approved by the Owner, at no cost to the Owner. The new Bond shall be executed under the same terms and conditions as the original Bond. The new bond shall be submitted within thirty (30) days of such time as the Owner notifies Contractor or from the time Contractor learns or has reason to know that the original surety is no longer financially viable or acceptable to the Parish, whichever occurs first. In the event that Contractor fails or refuses to timely secure additional surety, then the Owner may secure such surety and thereafter deduct such cost or expense from any sum due or to become due Contractor.
- 03.09 The Contractor's bondsman shall obligate itself to all the terms and covenants of these Specifications and of contracts covering the Work executed hereunder. The Owner reserves the right to do Extra Work or make changes by altering, adding to deducting from the Work under the conditions and in the manner herein before described without notice to the Contractor's surety and without in any manner affecting the liability of bondsman or releasing it from any of its obligations hereunder.
- 03.10 The Bond shall also secure for the Owner the faithful performance of the Contract in strict accordance with plans and Specifications. It shall protect the Owner against all lien laws of the State and shall provide for payment of reasonable attorney fees for enforcement of Contract and institution or concursus proceedings, if such proceedings become necessary. Likewise, it shall provide for all additional expenses of the Owner occurring through failure of the Contractor to perform.
- 03.11 The surety of the Contractor shall be and does hereby declare and acknowledge itself by acceptance to be bound to the Owner as a guarantor, jointly and in solido, with the Contractor, for fulfillment of terms of Section 03.00.
- 03.12 The performance Bond and Labor and Material Bond forming part of this Contract shall be continued by Contractor and its Surety for a period of one (1) year from date of

acceptance of this Contract by Owner to assure prompt removal and replacement of all defective material, equipment, components thereof, workmanship, etc., and to assure payment of any damage to property of Owner or others as a result of such defective materials, equipment, workmanship, etc.

- 03.13 Contractor shall pay for the cost of recording the Contract and Bond and the cost of canceling same. Contractor shall also secure and pay for all Clear Lien and Privilege Certificates (together with any updates) which will be required before any final payment is made, and that may be required before any payment, at the request of the Owner, its representative, agent, architect, engineer and the like. All recordation and Clear Lien and Privilege Certificate requirements shall be in accordance with those requirements noted herein before in contract Specifications.

#### 04.00 SUBCONTRACTS

- 04.01 Contractor shall be fully responsible for all acts and omissions of its Subcontractors and of persons and organizations for whose acts any of them may be liable to the same extent that it is responsible for the acts and omissions of persons directly employed by it. Nothing in the Contract Documents shall create any contractual relationship between Owner and any Subcontractor or other person or organization having a direct Contract with Contractor, nor shall it create any obligation on the part of the Owner to pay or to see to the payment of any monies due any Subcontractor.

- 04.02 Nothing in the Contract Documents shall be construed to control the Contractor in dividing the Work among approved Subcontractors or delineating the Work to be performed by any trade.

- 04.03 The Contractor agrees to specifically bind every Subcontractor to all of the applicable terms and conditions of the Contract Documents prior to commencing Work. Every Subcontractor, by undertaking to perform any of the Work, shall thereby automatically be deemed bound by such terms and conditions.

- 04.04 The Contractor shall indemnify and hold harmless the Owner 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 Contractor's failure to bind every Subcontractor and Contractor's surety to all of the applicable terms and conditions of the Contract Documents.

#### 05.00 ASSIGNMENT

- 05.01 Neither party to this Contract shall assign or sublet its interest in this Contract without prior written consent of the other, nor shall the Contractor assign any monies due or to become due to it under this Contract without previous written consent of the Owner, nor without the consent of the surety unless the surety has waived its right to notice of assignment.

## 06.00 CORRELATION, INTERPRETATION AND INTENT OF CONTRACT DOCUMENTS.

- 06.01 It is the intent of the Specifications and Drawings to describe a complete Project to be constructed in accordance with the Contract Documents. The Contract Documents comprise the entire Agreement between Owner and Contractor. Alterations, modifications and amendments shall only be in writing between these parties.
- 06.02 The Contract Documents are intended to be complimentary and to be read *in pari materii*, and what is called for by one is as binding as if called for by all. If Contractor finds a conflict, error or discrepancy in the Contract Documents, it shall call it to the Owner's attention, in writing, at once and before proceeding with the Work affected thereby; however, it shall be liable to Owner for its failure to discover any conflict, error or discrepancy in the Specifications or Drawings. In resolving such conflicts, errors and discrepancies, the documents shall be given precedence in the following order: Agreement, Modifications, Addenda, Special Conditions, General Conditions, Construction Specifications and Drawings. The general notes on the plans shall be considered special provisions. Figure dimensions on Drawings shall govern over scale dimensions and detail Drawings shall govern over general Drawings. Where sewer connections are shown to fall on a lot line between two lots, the Contractor shall determine this location by measurement not by scale. Any Work that may reasonably be inferred from the Specifications or Drawings as being required to produce the intended result shall be supplied whether or not it is specifically called for. Work, materials or equipment described herein which so applied to this Project are covered by a well-known technical meaning or specification shall be deemed to be governed by such recognized standards unless specifically excluded.
- 06.03 Unless otherwise provided in the Contract Documents, the Owner will furnish to the Contractor (free of charge not to exceed ten (10) copies) Drawings and Specifications for the execution of Work. The Drawings and Specifications are the property of the Owner and are to be returned to it when the purpose for which they are intended have been served. The Contractor shall keep one copy of all Drawings and Specifications, including revisions, Addenda, details, Shop Drawings, etc. on the Work in good order and available to the Owner or the regulatory agency of the governmental body having jurisdiction in the area of the Work.

## 07.00 SHOP DRAWINGS, BROCHURES AND SAMPLES

- 07.01 After checking and verifying all field measurements, Contractor shall submit to Owner for approval, five copies (or at Owner's option, one reproducible copy) of all Shop Drawings, which shall have been checked by and stamped with the approval of Contractor and identified as Owner may require. The data shown on the Shop Drawings will be complete with respect to dimensions, design criteria, materials of construction and the like to enable Owner to review the information as required.

- 07.02 Contractor shall also submit to Owner, for review with such promptness as to cause no delay in Work, all samples as required by the Contract Documents. All samples will have been checked by and stamped with the approval of Contractor identified clearly as to material, manufacturer, any pertinent catalog numbers and the use for which intended. At the time of each submission, Contractor shall in writing call Owner's attention to any deviations that the Shop Drawings or samples may have from the requirements of the Contract Documents.
- 07.03 Owner will review with reasonable promptness Shop Drawings and samples, but its review shall be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents. The review of a separate item as such will not indicate approval of the assembly in which the item functions. Contractor shall make any corrections required by Owner and shall return the required number of corrected copies of Shop Drawings and resubmit new samples for review. Contractor shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections called for by Owner on previous submissions. Contractor's stamp of approval on any Shop Drawing or sample shall constitute a representation to Owner that Contractor has determined and verified all quantities, dimensions, field construction criteria, materials catalog numbers and similar data and thereafter assumes full responsibility for doing so, and that it has reviewed or coordinated each Shop Drawing or sample with the requirements of the Work and the Contract Documents.
- 07.04 Where a Shop Drawing or sample submission is required by the Specifications, no related Work shall be commenced until the submission has been reviewed by Owner. A copy of each reviewed shop Drawing and each inspected sample shall be kept in good order by Contractor at the site and shall be available to Owner.
- 07.05 Owner's review of Shop Drawings or samples shall not relieve Contractor from its responsibility for any deviations from the requirements of the Contract Documents unless Contractor has in writing called Owner's attention to such deviation at the time of submission and Owner has given written approval to the specific deviation, nor shall any review by Owner relieve Contractor from responsibility for errors or omissions in the Shop Drawings. The mere submittal of shop drawings which contain deviations from the requirements of plans, specifications and/or previous submittals in itself does not satisfy this requirement.
- 08.00 RECORD DRAWINGS
- 08.01 The Contractor shall keep an accurate record in a manner approved by the Owner of all changes in the Contract Documents during construction. In Work concerning underground utilities, the Contractor shall keep an accurate record in a manner approved by the Owner of all valves, fittings, etc. Before the Work is accepted by the Owner, and said acceptance is recorded, the Contractor shall furnish the Owner a copy of this record.

- 08.02 Contractor shall keep an accurate drawing measured in the field to the nearest 0.1' of the location of all sewer house connections. The location shown shall be the end of the connection at the property line measured along the main line of pipe from a manhole.
- 08.03 Contractor shall keep an accurate drawing of the storm water drainage collection system. Inverts to the nearest 0.01' and top of castings shall be shown as well as location of all structures to the nearest 0.1'. Upon completion of the Work, the plan will be given to the Owner.

#### 09.00 PROGRESS OF WORK

- 09.01 Contractor shall conduct the Work in such a professional manner and with sufficient materials, equipment and labor as is considered necessary to ensure its completion within the time limit specified.
- 09.02 The Owner shall issue a Notice to Proceed to the Contractor within twenty (20) calendar days from the date of execution of the Contract. Upon mutual consent by both parties, the Notice to Proceed may be extended. The Contractor is to commence Work under the Contract within ten (10) calendar days from the date the Notice to Proceed is issued by the Owner.
- 09.03 The Contractor, immediately after being awarded the Contract, shall prepare and submit for the Owner's approval an estimated progress schedule for the work to be performed, as well as a construction signing layout for all roads within the project area. The Contractor shall not start work or request partial payment until the work schedule has been submitted to the Owner for approval.
- 09.04 Revisions to the original schedule will be made based on extension of days granted for inclement weather or change orders issued under the contract. No other revision shall be made which affects the original completion or updated completion date, whichever is applicable.
- 09.05 Failure of the Contractor to submit an estimated progress schedule or to complete timely and on schedule the Work shown on the progress schedule negates any and all causes or claims by the Contractor for accelerated completion damages. These accelerated damage claims shall be deemed forfeited.
- 09.06 Meetings will be held as often as necessary to expedite the progress of the job. Meetings will be held during normal working hours at the jobsite and shall be mandatory for the Contractor and all Sub-Contractors working on the project. Meetings may be requested by the Owner at any time and at the discretion of the Owner.

#### 10.00 OWNER'S RIGHT TO PROCEED WITH PORTIONS OF THE WORK

- 10.01 Upon failure of the Contractor to comply with any notice given in accordance with the provisions hereof, the Owner shall have the alternative right, instead of assuming charge of the entire Work, to place additional forces, tools, equipment and materials on parts of the Work. The cost incurred by the Owner in carrying on such parts of the Work shall be payable by the Contractor. Such Work shall be deemed to be carried on by the Owner on account of the Contractor. The Owner may retain all amounts of the cost of such Work from any sum due Contractor or those funds that may become due to Contractor under this Agreement.
- 10.02 Owner may perform additional Work related to the Project by itself or it may let any other direct contract which may contain similar General Conditions. Contractor shall afford the other contractors who are parties to such different contracts (or Owner, if it is performing the additional Work itself) reasonable opportunity for the introduction and storage of materials and equipment and the execution of Work, and shall properly connect and coordinate its Work with the subsequent work.
- 10.03 If any part of Contractor's Work depends upon proper execution or results upon the Work of any such other contractor (or Owner), Contractor shall inspect and promptly report to Owner in writing any defects or deficiencies in such Work that render it unsuitable for such proper execution and results. Failure to so report shall constitute an acceptance of the other Work as fit and proper for the relationship of its Work except as to defects and deficiencies which may appear in the other Work after the execution of its Work.
- 10.04 Whatever Work is being done by the Owner, other Contractors or by this Contractor, the parties shall respect the various interests of the other parties at all times. The Owner may, at its sole discretion, establish additional rules and regulations concerning such orderly respect of the rights of various interests.
- 10.05 Contractor shall do all cutting, fitting and patching of its Work that may be required to integrate its several parts properly and fit to receive or be received by such other Work. Contractor shall not endanger any Work of others by cutting, excavating or otherwise altering Work and will only alter Work with the written consent of Owner and of the other contractors whose Work will be affected.
- 10.06 If the performance of additional Work by other contractors or Owner is not noted in the Contract Documents, written notice thereof shall be given to Contractor prior to starting any such additional Work. If Contractor believes that the performance of such additional Work by Owner or others may cause additional expense or entitles an extension of the Contract Time, the Contractor may make a claim therefor. The claim must be in writing to the Owner within thirty (30) calendar days of receipt of notice from the Owner of the planned additional Work by others.



## 11.00 TIME OF COMPLETION

- 11.01 The Notice to Proceed will stipulate the date on which the Contractor shall begin work. That date shall be the beginning of the Contract Time charges.
- 11.02 Contractor shall notify the Owner through its duly authorized representative, in advance, of where Contractor's work shall commence each day. A daily log shall be maintained by Contractor to establish dates, times, persons contacted, and location of work. Specific notice shall be made to the Owner if the Contractor plans to work on Saturday, Sunday, or a Parish approved holiday. If notice is not received, no consideration will be given for inclement weather and same shall be considered a valid work day.
- 11.03 The Work covered by the Plans, Specifications and Contract Documents must be completed sufficiently for acceptance within the number of calendar days specified in the Proposal and/or the Contract, commencing from the date specified in the Notice to Proceed. It is hereby understood and mutually agreed, by and between the Contractor and the Owner, that the time of completion is an essential condition of this Contract, and it is further mutually understood and agreed that if the Contractor shall neglect, fail or refuse to complete the Work within the time specified, or any proper extension thereof granted by the Owner, then the Contractor does hereby agree, as partial consideration for the awarding of this Contract, to pay the Owner \$1,500.00 per day as specified in the Contract, not as a penalty, but as liquidated damages for such breach of contract for each and every calendar day that the Contractor shall be in default after the time stipulated in the Contract for completing the Work. It is specifically understood that the Owner shall also be entitled to receive a reasonable attorney fee and all costs in the event that Contractor fails to adhere to this agreement and this contract is referred to counsel for any reason whatsoever. Reasonable attorney fees shall be the prevailing hourly rate of the private sector, and in no event shall the hourly rate be less than \$175.00 per hour. All attorney fees shall be paid to the operating budget of the Office of the Parish President.
- 11.04 Prior to final payment, the Contractor may, in writing to the Owner, certify that the entire Project is substantially complete and request that the Owner or its agent issue a certificate of Substantial Completion. See Section 29.00.
- 11.05 The Owner may grant an extension(s) of time to the Contractor for unusual circumstances which are beyond the control of the Contractor and could not reasonably be foreseen by the Contractor prior to Bidding. Any such request must be made in writing to the Owner within seven (7) calendar days following the event occasioning the delay. The Owner shall have the exclusive and unilateral authority to determine, grant, and/or deny the validity of any such claim.
- 11.06 Extensions of time for inclement weather shall be processed as follows:

Commencing on the start date of each job, the Parish Inspector assigned to same shall keep a weekly log, indicating on each day whether inclement weather has

prohibited the Contractor from working on any project within the specific job, based upon the following:

1. Should the Contractor prepare to begin work on any day in which inclement weather, or the conditions resulting from the weather, prevent work from beginning at the usual starting time, and the crew is dismissed as a result, the Contractor will not be charged for a working day whether or not conditions change during the day and the rest of the day becomes suitable for work.
2. If weather conditions on the previous day prevent Contractor from performing work scheduled, provided that no other work can be performed on any project within the package. The Parish Inspector shall determine if it is financially reasonable to require the Contractor to deviate from the schedule and relocate to another location.
3. If the Contractor is unable to work at least 60% of the normal work day due to inclement weather, provided that a normal working force is engaged on the job.

Any dispute of weather conditions as related to a specific job shall be settled by records of the National Weather Service.

#### 11.07 Extensions of time for change orders

When a change order is issued, the Owner and Contractor will agree on a reasonable time extension, if any, to implement such change. Consideration shall be given for, but not limited to, the following:

1. If material has to be ordered;
2. Remobilization and or relocation of equipment to perform task; and
3. Reasonable time frame to complete additional work.

Time extensions for change orders shall be reflected on the official document signed by the Owner and Contractor.

11.08 At the end of each month, the Owner or its agent will furnish to the Contractor a monthly statement which reflects the number of approved days added to the contract. The Contractor will be allowed fourteen (14) calendar days in which to file a written protest setting forth in what respect the monthly statement is incorrect; otherwise, the statement shall be considered accepted by the Contractor as correct.

11.09 Apart from extension of time for unavoidable delays, no payment or allowance of any kind shall be made to the Contractor as compensation for damages because of hindrance or delay for any cause in the progress of the Work, whether such delay be avoidable or unavoidable.

## 12.00 LIQUIDATED DAMAGES

12.01 In case the Work is not completed in every respect within the time that may be extended, it is understood and agreed that per diem deductions of the sum of \$1,500.00 for liquidated damages, as stipulated in the Proposal and/or Contract, shall be made from the total Contract Price for each and every calendar day after and exclusive of the day on which completion was required, and up to the completion of the Work and acceptance thereof by the Owner. It is understood and agreed that time is of the essence to this Contract, and the above sum being specifically herein agreed upon in advance as the measure of damages to the Owner on account of such delay in the completion of the Work. It is further agreed that the expiration of the term herein assigned or as may be extended for performing the Work shall, *ipso facto*, constitute a putting in default, the Contractor hereby waiving any and all notice of default. The Contractor agrees and consents that the Contract Price, reduced by the aggregate of the entire damages so deducted, shall be accepted in full satisfaction of all Work executed under this Contract. It is further understood and agreed that Contractor shall be liable for a reasonable attorney fee and all costs associated with any breach of this agreement, including but not limited to this subsection. In the event that any dispute or breach herein causes referrals to counsel, then Contractor agrees to pay a reasonable attorney fee at the prevailing hourly rate of the private sector. In no event shall the hourly rate be less than \$175.00 per hour.

## 13.00 LABOR, MATERIALS, EQUIPMENT, SUPERVISION, PERMITS AND TAXES

13.01 The Contractor shall provide and pay for all labor, materials, equipment, supervision, subcontracting, transportation, tools, fuel, power, water, sanitary facilities and all incidentals necessary for the completion of the Work in substantial conformance with the Contract Documents.

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

13.03 Unless otherwise specifically provided for in the Specifications, all workmanship, equipment, materials, and articles incorporated in the Work covered by this Contract are to be new and of the best grade of their respective kinds for the purpose intended. Samples of materials furnished under this Contract shall be submitted for approval to the Owner when and as directed.

13.04 Whenever a material or article required is specified or shown on the plans by using the name of a proprietary product or of a particular manufacturer or vendor, any material or article which shall perform adequately the duties imposed by the general design will be considered equal, and satisfactory, providing the material or article so proposed is of equal substance and function and that all technical data concerning the proposed substitution be approved by the Owner prior to the Bidding. The Owner shall have the exclusive and

unilateral discretion to determine quality and suitability in accordance with LSA-R.S. 38:2212(T)(2).

- 13.05 Materials shall be properly and securely stored so as to ensure the preservation of quality and fitness for the Work, and in a manner that leaves the material accessible to inspection. Materials or equipment may not be stored on the site in a manner such that it will interfere with the continued operation of streets and driveways or other contractors working on the site.
- 13.06 The Contractor, by entering into the Contract for this Work, sets itself forth as an expert in the field of construction and it shall supervise and direct the Work efficiently and with its best skill and attention. It shall be solely responsible for the means, methods, techniques, sequences and procedures of construction.
- 13.07 Contractor shall keep on the Work, at all times during its progress, a competent resident Superintendent, who shall not be replaced without written Notice to Owner except under extraordinary circumstances. The Superintendent will be Contractor's representative at the site and shall have authority to act on behalf of Contractor. All communications given to the Superintendent shall be as binding as if given to the Contractor. Owner specifically reserves the right to approve and/or disapprove the retention of a new superintendent, all to not be unreasonably withheld.
- 13.08 Any foreman or workman employed on this Project who disregards orders or instructions, does not perform his Work in a proper and skillful manner, or is otherwise objectionable, shall, at the written request of the Owner, be removed from the Work and shall be replaced by a suitable foreman or workman.
- 13.09 The Contractor and/or its assigned representative shall personally ensure that all subcontracts and divisions of the Work are executed in a proper and workmanlike manner, on scheduled time, and with due and proper cooperation.
- 13.10 Failure of the Contractor to keep the necessary qualified personnel on the Work shall be considered cause for termination of the Contract by the Owner.
- 13.11 Only equipment in good working order and suitable for the type of Work involved shall be brought onto the job and used by the Contractor. The Contractor is solely responsible for the proper maintenance and use of its equipment and shall hold the Owner harmless from any damages or suits for damages arising out of the improper selection or use of equipment. No piece of equipment necessary for the completion of the Work shall be removed from the job site without approval of the Owner.
- 13.12 All Federal, State and local taxes due or payable during the time of Contract on materials, equipment, labor or transportation, in connection with this Work, must be included in the amount bid by the Contractor and shall be paid to proper authorities before acceptance. The Contractor shall furnish all necessary permits and certificates and comply with all laws and

ordinances applicable to the locality of the Work. The cost of all inspection fees levied by any governmental entity whatsoever shall be paid for by the Contractor.

- 13.13 In accordance with St. Tammany Police Jury Resolution 86-2672, as amended, the Contractor must provide in a form suitable to the Owner an affidavit stating that all applicable sales taxes for materials used on this project have been paid.
- 13.14 During the period that this Contract is in force, neither party to the Contract shall solicit for employment or employ an employee of the other.
- 13.15 All materials or equipment shown on the Drawings or included in these specifications shall be furnished unless written approval of a substitute is obtained from the Designer, or Owner if no separate designer.
- 13.16 If a potential supplier wishes to submit for prior approval a particular product other than a product specified in the contract documents, he shall do so no later than seven working days prior to the opening of bids. Within three days, exclusive of holidays and weekends, after such submission, the prime design professional shall furnish to both the public entity and the potential supplier written approval or denial of the product submitted. The burden of proof of the equality of the proposed substitute is upon the proposer and only that information formally submitted shall be used by the Designer in making its decision.
- 13.17 The decision of the Designer/Owner shall be given in good faith and shall be final.

#### 14.00 QUANTITIES OF ESTIMATE, CHANGES IN QUANTITIES, EXTRA WORK

- 14.01 Whenever the estimated quantities of Work to be done and materials to be furnished under this Contract are shown in any of the documents, including the Proposal, such are given for use in comparing Bids and the right is especially reserved, except as herein otherwise specifically limited, to increase or diminish same not to exceed twenty-five percent (25%) by the Owner to complete the Work contemplated by this Contract. Such increase or diminution shall in no way vitiate this Contract, nor shall such increase or diminution give cause for claims or liability for damages.
- 14.02 The Owner shall have the right to make alterations in the line, grade, plans, form or dimensions of the Work herein contemplated, provided such alterations do not change the total cost of the Project, based on the originally estimated quantities, and the unit prices bid by more than twenty-five percent (25%) and provided further that such alterations do not change the total cost of any major item, based on the originally estimated quantities and the unit price bid by more than twenty-five (25%). (A major item shall be construed to be any item, the total cost of which is equal to or greater than ten percent (10%) of the total Contract Price, computed on the basis of the Proposal quantity and the Contract unity price). Should it become necessary, for the best interest of the Owner, to make changes in excess of that herein specified, the same shall be covered by supplemental agreement either before or after the commencement of the Work and without notice to the sureties. If such alterations diminish the quantity of Work to be done, such shall not constitute a claim for

damages for anticipated profits for the Work dispensed with, but when the reduction in amount is a material part of the Work contemplated, the Contractor shall be entitled to only reasonable compensation as determined by the Owner for overhead and equipment charges which it may have incurred in expectation of the quantity of Work originally estimated, unless specifically otherwise provided herein; if the alterations increase the amount of Work, the increase shall be paid according to the quantity of Work actually done and at the price established for such Work under this Contract except where, in the opinion of the Owner, the Contractor is clearly entitled to extra compensation.

- 14.03 Without invalidating the Contract, the Owner may order Extra Work or make changes by altering, adding to, or deducting from the Work, the Contract sum being adjusted accordingly. The consent of the surety must first be obtained when necessary or desirable, all at the exclusive discretion of the Owner. All the Work of the kind bid upon shall be paid for at the price stipulated in the Proposal, and no claims for any Extra Work or material shall be allowed unless the Work is ordered in writing by the Owner.
- 14.04 Extra Work for which there is no price or quantity included in the Contract shall be paid for at a unit price or lump sum to be agreed upon in advance in writing by the Owner and Contractor. Where such price and sum cannot be agreed upon by both parties, or where this method of payment is impracticable, the Owner may, at its exclusive and unilateral discretion, order the Contractor to do such Work on a Force Account Basis.
- 14.05 In computing the price of Extra Work on a Force Account Basis, the Contractor shall be paid for all foremen and labor actually engaged on the specific Work at the current local rate of wage for each and every hour that said foremen and labor are engaged in such Work, plus ten percent (10%) of the total for superintendence, use of tools, overhead, direct & indirect costs/expenses, pro-rata applicable payroll taxes, pro-rata applicable workman compensation benefits, pro-rata insurance premiums and pro-rata reasonable profit. The Contractor shall furnish satisfactory evidence of the rate or rates of such insurance and tax. The Contractor will not be able to collect any contribution to any retirement plans or programs.
- 14.06 For all material used, the Contractor shall receive the actual cost of such material delivered at the site of the Work, as shown by original receipted bill, to which shall be added five percent (5%). There will be absolutely no additional surcharges or additional fees attached hereto with respect to this subsection.
- 14.07 For any equipment used that is owned by the Contractor, the Contractor shall be allowed a rental based upon the latest prevailing rental price, but not to exceed a rental price as determined by the Associated Equipment Distributors (A.E.D. Green Book).
- 14.08 The Contractor shall also be paid the actual costs of transportation for any equipment which it owns and which it has to transport to the Project for the Extra Work. There will be absolutely no additional surcharges or additional fees attached hereto with respect to this subsection.

- 14.09 If the Contractor is required to rent equipment for Extra Work, but not required for Contract items, it will be paid the actual cost of rental and transportation of such equipment to which no percent shall be added. The basis upon which rental cost are to be charged shall be agreed upon in writing before the Work is started. Actual rental and transportation costs shall be obtained from receipted invoices and freight bills.
- 14.10 No compensation for expenses, fees or costs incurred in executing Extra Work, other than herein specifically mentioned herein above, will be allowed.
- 14.11 A record of Extra Work on Force Account basis shall be submitted to the Owner on the day following the execution of the Work, and no less than three copies of such record shall be made on suitable forms and signed by both the Owner or his representative on the Project and the Contractor. All bids for materials used on extra Work shall be submitted to the Owner by the Contractor upon certified statements to which will be attached original bills covering the costs of such materials.
- 14.12 Payment for Extra Work of any kind will not be allowed unless the same has been ordered in writing by the Owner.

15.00 STATUS OF THE ENGINEER (NOT APPLICABLE)

16.00 INJURIES TO PERSONS AND PROPERTY

- 16.01 The Contractor shall be held solely and exclusively responsible for all injuries to persons and for all damages to the property of the Owner or others caused by or resulting from the negligence of itself, its employees or its agents, during the progress of or in connection with the Work, whether within the limits of the Work or elsewhere under the Contract proper or as Extra Work. This requirement will apply continuously and not be limited to normal working hours or days. The Owner's construction review is for the purpose of checking the Work product produced and does not include review of the methods employed by the Contractor or to the Contractor's compliance with safety measures of any nature whatsoever. The Contractor agrees to pay a reasonable attorney fee and other reasonable attendant costs of the Owner in the event it becomes necessary for the Owner to employ an attorney to enforce this section or to protect itself against suit over the Contractor's responsibilities. Attorney fees shall be at the prevailing hourly rate of the private sector. The attorney fee hourly rate shall not be less than \$175.00 per hour. All attorney fees collected shall be paid to the operating budget of the Office of the Parish President.
- 16.02 The Contractor must protect and support all utility infrastructures or other properties which are liable to be damaged during the execution of its Work. It shall take all reasonable and proper precautions to protect persons, animals and vehicles or the public from the injury, and wherever necessary, shall erect and maintain a fence or railing around any excavation, and place a sufficient number of lights about the Work and keep same burning from twilight until sunrise, and shall employ one or more watchmen as an additional security whenever needed. The Contractor understands and agrees that the Owner may request that security

be placed on the premises to ensure and secure same. The Owner shall have exclusive authority to request placement of such security. Contractor agrees to retain and place security as requested, all at the sole expense of Contractor. Additional security shall not be considered a change order or reason for additional payment by the Owner. The Contractor must, as far as practicable and consistent with good construction, permit access to private and public property and leave fire hydrants, catch basins, streets, etc., free from encumbrances. The Contractor must restore at its own expense all injured or damaged property caused by any negligent act of omission or commission on its part or on the part of its employees or subcontractors, including, but not limited to, sidewalks, curbing, sodding, pipes conduits, sewers, buildings, fences, bridges, retaining walls, tanks, power lines, levees or any other building or property whatsoever to a like condition as existed prior to such damage or injury.

- 16.03 In case of failure on the part of the Contractor to restore such property or make good such damage, the Owner may upon forty-eight (48) hours' notice proceed to repair or otherwise restore such property as may be deemed necessary, and the cost thereof will be deducted from any monies due or which may become due under its Contract.
- 16.04 Contractor agrees to protect, defend, indemnify, save, and hold harmless St. Tammany Parish Government, its elected and appointed officials, departments, agencies, boards and commissions, their officers, agents servants, employees, including volunteers, from and against any and all claims, demands, expense and liability arising out of injury or death to any person or the damage, loss or destruction of any property to the extent caused by any negligent act or omission or willful misconduct of Contractor, its agents, servants, employees, and subcontractors, or any and all costs, expense and/or attorney fees incurred by St. Tammany Parish Government as a result of any claim, demands, and/or causes of action that results from the negligent performance or non-performance by Contractor, its agents, servants, employees, and subcontractors of this contract. Contractor agrees to investigate, handle, respond to, provide defense for and defend any such claims, demand, or suit at its sole expense and agrees to bear all other costs and expenses related thereto caused by any negligent act or omission or willful misconduct of Contractor, its agents, servants, employees, and subcontractors.
- 16.05 As to any and all claims against Owner, its agents, assigns, representatives or employees by any employee of Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts as may be liable, the indemnification obligation under Paragraph 16.04 shall not be limited in any way or by any limitation on the amount or type of damages, compensation or benefits payable by or for Contractor or any Subcontractor under workmen's compensation acts, disability benefit acts or other employee benefit acts.
- 16.06 No road shall be closed by the Contractor to the public except by written permission of the Owner. If so closed, the Contractor shall maintain traffic over, through and around the Work included in his Contract, with the maximum practical convenience, for the full twenty-four hours of each day of the Contract, whether or not Work has ceased temporarily. The Contractor shall notify the Owner at the earliest possible date after the Contract has



been executed and, in any case, before commencement of any construction that might in any way inconvenience or endanger traffic, in order that necessary and suitable arrangements may be determined. Any and all security, maintenance, labor or costs associated with traffic control herein shall be at the sole expense of Contractor. This expense shall be paid directly by the Contractor. This expense shall not be considered as a change order nor shall it allow the Contractor any additional cost reimbursement whatsoever. All traffic deviations herein shall be coordinated with the appropriate law enforcement officials of this Parish.

- 16.07 The convenience of the general public and residents along the Works shall be provided for in a reasonable, adequate and satisfactory manner. Where existing roads are not available as detours, and unless otherwise provided, all traffic shall be permitted to pass through the Work. In all such cases, the public shall have precedence over Contractor's vehicles insofar as the traveling public's vehicles shall not be unduly delayed for the convenience of the Contractor. In order that all unnecessary delay to the traveling public may be avoided, the Contractor shall provide and station competent flagmen whose sole duties shall consist of directing and controlling the movement of public traffic either through or around the Work. Any and all security, maintenance, labor or costs associated with traffic control herein shall be at the sole expense of Contractor. This expense shall be paid directly by the Contractor. This expense shall not be considered as a change order nor shall it allow the Contractor any additional cost reimbursement whatsoever. All traffic deviations herein shall be coordinated with the appropriate law enforcement officials of this Parish.
- 16.08 The Contractor shall arrange its Work so that no undue or prolonged blocking of business establishments will occur.
- 16.09 Material and equipment stored on the right of way or work site shall be so placed and the Work at times shall be so conducted as to ensure minimum danger and obstruction to the traveling public.
- 16.10 During grading operations when traffic is being permitted to pass through construction, the Contractor shall provide a smooth, even surface that will provide a satisfactory passageway for use of traffic. The road bed shall be sprinkled with water if necessary to prevent a dust nuisance, provided the dust nuisance is a result of the Work.
- 16.11 Fire hydrants shall be accessible at all times to the Fire Department. No material or other obstructions shall be placed closer to a fire hydrant than permitted by ordinances, rules or regulations or within fifteen (15) feet of a fire hydrant, in the absence of such ordinance, rules or regulations.
- 16.12 The Contractor shall not, without the written permission of the Owner, do Work for a resident or property owner abutting the Work at the time that this Work is in progress.
- 16.13 No Work of any character shall be commenced on railroad right-of-way until the Railroad Company has issued a permit to the Owner and has been duly notified by the Contractor in writing (with a copy forwarded to the Owner) of the date it proposes to begin Work, and

until an authorized representative of the Railroad Company is present, unless the Railroad Company waives such requirements. All Work performed by the Contractor within the right-of-way limits of the railroad shall be subject to the inspection and approval of the chief engineer of the Railroad Company or its authorized representative. Any precautions considered necessary by said chief engineer to safeguard the property, equipment, employees and passengers of the Railroad Company shall be taken by the Contractor without extra compensation. The Contractor shall, without extra compensation, take such precautions and erect and maintain such tell-tale or warning devices as the Railroad Company considers necessary to safeguard the operation of its trains. The temporary vertical and horizontal clearance specified by the chief engineer of the Railroad Company in approving these shall be maintained at all times. No steel, brick, pipe or any loose material shall be left on the ground in the immediate vicinity of the railway track. Before any Work is done within Railroad right of way, the Contractor shall provide and pay all costs of any special insurance requirements of the Railroad.

- 16.14 The Contractor, shall, without extra compensation, provide, erect, paint and maintain all necessary barricades. Also, without extra compensation, the Contractor shall provide suitable and sufficient lights, torches, reflectors or other warning or danger signals and signs, provide a sufficient number of watchmen and flagmen and take all the necessary precautions for the protection of the Work and safety of the Public.
- 16.15 The Contractor shall erect warning signs beyond the limits of the Project, in advance of any place on the Project where operations interfere with the use of the road by traffic, including all intermediate points where the new Work crosses or coincides with the existing road. All barricades and obstructions shall be kept well painted and suitable warning signs shall be placed thereon. All barricades and obstructions shall be illuminated at night and all lights or devices for this purpose shall be kept burning from sunset to sunrise.
- 16.16 Whenever traffic is maintained through or over any part of the Project, the Contractor shall clearly mark all traffic hazards. No direct payment will be made for barricades, signs and illumination therefore or for watchmen or flagmen.
- 16.17 The Contractor will be solely and completely responsible for conditions on the job site, including safety of all persons and property during performance of the Work. This requirement will apply continuously and not be limited to normal working hours. The duty of the Owner to conduct construction review of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures, in, or near the construction site.

#### 17.00 SANITARY PROVISIONS

- 17.01 The Contractor shall provide and maintain in a neat, sanitary condition such accommodations for the use of its employees as may be necessary to comply with the rules

and regulations of the State Health Agency or of the other authorities having jurisdiction and shall permit no public nuisance.

#### 18.00 RIGHTS OF WAY

18.01 The Owner will furnish the Contractor with all necessary rights-of-way for the prosecution of the Work. The rights of way herein referred to shall be taken to mean only permission to use or pass through the locations or space in any street, highway, public or private property in which the Contractor is to prosecute the Work.

18.02 It is possible that all lands and rights of way may not be obtained as herein contemplated before construction begins, in which event the Contractor shall begin its Work upon such land and rights of way as the Owner may have previously acquired. Any delay in furnishing these lands by the Owner can be deemed proper cause for adjustment in the Contract amount and/or in the time of completion.

#### 19.00 PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE

19.01 The Contractor shall not enter upon private property for any purpose without first obtaining permission from the Owner, as well as the private property owner and/or and private property Lessees. The Contractor shall use every precaution necessary for the preservation of all public and private property, monuments, highway signs, telephone lines, other utilities, etc., along and adjacent to the Work; the Contractor shall use every precaution necessary to prevent damage to pipes, conduits, and other underground structures; and shall protect carefully from disturbance or damage all land monuments and property marks until an authorized agent has witnessed or otherwise referenced their location and shall not remove them until directed. The street and highway signs and markers that are to be affected by the Work shall be carefully removed when the Work begins and stored in a manner to keep them clean and dry. The Contractor must obtain all necessary information in regard to existing utilities and shall give notice in writing to the owners or the proper authorities in charge of streets, gas, water, pipes, electric, sewers and other underground structures, including conduits, railways, poles and pole lines, manholes, catch basins, fixtures, appurtenances, and all other property that may be affected by the Contractor's operations, at least forty-eight (48) hours before its operations will affect such property. The Contractor shall not hinder or interfere with any person in the protection of such Work or with the operation of utilities at any time. When property, the operation of railways, or other public utilities are endangered, the Contractor shall at its own expense, maintain flagmen or watchmen and any other necessary precautions to avoid interruption of service or damage to life or property, and it shall promptly repair, restore, or make good any injury or damage caused by its negligent operations in an acceptable manner. The Contractor must also obtain all necessary information in regard to the installation of new cables, conduits, and transformers, and make proper provisions and give proper notifications, in order that same can be installed at the proper time without delay to the Contractor or unnecessary inconvenience to the Owner.

19.02 The Contractor shall not remove, cut or destroy trees, shrubs, plants, or grass that are to remain in the streets or those which are privately owned, without the proper authority. Unless otherwise provided in the Special Provisions or the Proposal, the Contractor shall replace and replant all plants, shrubs, grass and restore the grounds back to its original good condition to the satisfaction of the Owner and/or the property owner. The Contractor shall assume the responsibility of replanting and guarantees that plants, shrubs, grass will be watered, fertilized and cultivated until they are in a growing condition. No direct payment will be made for removing and replanting of trees, shrubs, plants or grass unless such items are set forth in the Proposal.

19.03 When or where direct damage or injury is done to public or private property by or on account of any negligent act, omission, neglect or otherwise of the Contractor, it shall make good such damage or injury in an acceptable manner.

## 20.00 CONTRACTORS RESPONSIBILITY FOR WORK

20.01 Until final acceptance of the Work by the Owner as evidence by approval of the final estimate, the Work shall be in the custody and under the charge and care of the Contractor and it shall take every necessary precaution against injury or damage to any part thereof by the action of the elements or from the non-execution of the Work; unless otherwise provided for elsewhere in the Specifications or Contract. The Contractor shall rebuild, repair, restore and make good, without extra compensation, all injuries or damages to any portion of the Work occasioned by any of the above causes before its completion and acceptance, and shall bear the expenses thereof. In case of suspension of the Work from any cause whatever, the Contractor shall be responsible for all materials and shall properly and securely store same, and if necessary, shall provide suitable shelter from damage and shall erect temporary structures where necessary. If in the exclusive discretion of the Owner, any Work or materials shall have been damaged or injured by reason of failure on the part of the Contractor or any of its Subcontractors to so protect the Work, such materials shall be removed and replaced at the sole expense of the Contractor. Such amount shall be deducted from any sum due or to be due Contractor.

20.02 The Contractor shall give all notice and comply with all Federal, State, and local laws, ordinances, and regulations in any manner affecting the conduct of the Work, and all such orders and decrees as exist, or may be enacted by bodies or tribunals having any jurisdiction or authority over the Work, and shall indemnify and hold harmless the Owner against any claim or liability arising from, or based on, the violation of any such law, ordinance, regulation, order or decree, whether by itself, its employees or Subcontractors.

## 21.00 TESTS AND INSPECTIONS CORRECTION & REMOVAL OF DEFECTIVE WORK

21.01 Contractor warrants and guarantees to Owner that all materials and equipment will be new unless otherwise specified and that all Work will be of good quality and free from faults or

defects and in accordance with the requirements of the Contract Documents. All unsatisfactory Work, all faulty or Defective Work and all Work not conforming to the requirements of the Contract Documents at the time of acceptance shall be considered Defective. Prompt and reasonable notice of all defects shall be given to the Contractor.

- 21.02 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 some public body, Contractor shall assume full responsibility therefor, pay all costs in connection therewith and furnish Owner the required certificates of inspection, testing or approval. All other inspections, tests and approval required by the Contract Documents shall be performed by organizations acceptable to Owner and Contractor and the costs thereof shall be borne by the Contractor unless otherwise specified.
- 21.03 Contractor shall give Owner timely notice of readiness of the Work for all inspections, tests or approvals. If any such Work required to be inspected, tested or approved is covered without written approval of Owner, it must, if requested by Owner, be uncovered for observation, and such uncovering shall be at Contractor's expense unless Contractor has given Owner timely notice of its intention to cover such Work and Owner has not acted with reasonable promptness in response to such notice.
- 21.04 Neither observations by Owner nor inspections, tests or approvals shall relieve Contractor from its obligations to perform the Work in accordance with the requirements of the Contract Document.
- 21.05 Owner and its representatives will at reasonable times have access to the Work. Contractor shall provide proper and safe facilities for such access and observation of the Work and also for any inspection or testing thereof by others.
- 21.06 If any Work is covered contrary to the written request of Owner, it must, be uncovered for Owner's observation and replaced at Contractor's expense. If any Work has been covered which Owner has not specifically requested to observe prior to its being covered, or if Owner considers it necessary or advisable that covered Work be inspected or tested by others, the Contractor, at Owner's request, shall uncover, expose or otherwise make available for observations, inspections or testing as Owner may require, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is Defective, Contractor shall bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, including compensation for additional professional services, and an appropriate deductive Change Order shall be issued. If, however, such Work is not found to be Defective, Contractor shall 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.
- 21.07 If the Work is Defective, or Contractor fails to supply sufficient skilled workmen or suitable materials or equipment, or if the Contractor fails to make prompt payments to Subcontractors or for labor, materials or equipment, Owner may order Contractor to stop

the Work, or any portion thereof, until the cause of such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor or any other party.

- 21.08 Prior to approval of final payment, Contractor shall promptly, without cost to Owner and as specified by Owner, either correct any Defective Work, whether or not fabricated, installed or completed, or if the Work has been rejected by Owner, remove it from the site and replace it with non-defective Work. If Contractor does not correct such Defective Work or remove and replace such rejected Work within a reasonable time, all as specified in a written notice from Owner, Owner may have the deficiency corrected or the rejected Work removed and replaced. All direct or indirect costs of such correction or removal and replacement including compensation for additional professional services shall be paid by Contractor, and an appropriate deductive Change Order shall be issued. Contractor shall also bear the expense of making good all Work of others destroyed or damaged by its correction, removal or replacement of its Defective Work.
- 21.09 If, after the approval of final payment and prior to the expiration of one year after the date of Substantial Completion or such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents, any Work is found to be Defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions, either correct such Defective Work or if it has been rejected by Owner, remove it from the site and replace it with non-defective Work. If Contractor does not promptly comply with the terms of such instructions, Owner may have the Defective Work corrected or the rejected Work removed and replaced, and all direct and indirect costs of such removal and replacement, including compensation for additional professional services, shall be paid by Contractor. The Contractor agrees to pay a reasonable attorney fee and other reasonable attendant costs of the Owner in the event it becomes necessary for the Owner to employ an attorney to enforce this section or to protect itself against suit over the Contractor's responsibilities. Attorney fees shall be at the prevailing hourly rate of the private sector. The attorney fee hourly rate shall not be less than \$175.00 per hour. All attorney fees collected shall be paid to the operating budget of the Office of the Parish President.
- 21.10 If, instead of requiring correction or removal and replacement of Defective Work, Owner (and prior to approval of final payment) prefers to accept it, the Owner may do so. In such case, if acceptance occurs prior to approval of final payment, a Change Order shall be issued incorporating the necessary revisions in the Contract Documents, including appropriate reduction in the Contract Price, or, if the acceptance occurs after approval of final payment, an appropriate amount shall be paid by Contractor to Owner.
- 21.11 If Contractor should fail to progress the Work in accordance with the Contract Documents, including any requirements of the Progress Schedule, Owner, after seven (7) days written Notice to Contractor, may, without prejudice to any other remedy Owner may have, make good such deficiencies and the cost thereof including compensation for additional professional services shall be charged against Contractor. In such cases, a Change Order shall be issued incorporating the necessary revisions in the Contract Documents including

an appropriate reduction in the Contract Price. If the payments then or thereafter due Contractor are not sufficient to cover such amount, Contractor shall pay the difference to Owner.

- 21.12 The Owner may appoint representatives to make periodic visits to the site and observe the progress and quality of the executed Work. These representatives shall be governed by the same restrictions placed on the Owner by these Specifications. The governing body of the Federal, State or local government exercising authority in the area of the Work may appoint representatives to observe the progress and quality of the Work. Contractor shall cooperate with and assist these representatives in the performance of their duties.
- 21.13 The Contractor shall be responsible for the faithful execution of its Contract and the presence or absence of the Owner's or Government's Representative is in no way or manner to be presumed or assumed to relieve in any degree the responsibility or obligation of the Contractor.
- 21.14 The Contractor shall notify the Owner and the Governmental Agency having jurisdiction as to the exact time at which it is proposed to begin Work so the Owner may provide for inspection of all materials, foundations, excavations, equipment, etc., and all or any part of the Work and to the preparation or manufacture of materials to be used whether within the limits of the Work or at any other place.
- 21.15 The Owner or its representatives shall have free access to all parts of the Work and to all places where any part of the materials to be used are procured, manufactured or prepared. The Contractor shall furnish the Owner all information relating to the Work and the material therefor, which may be deemed necessary or pertinent, and with such samples of materials as may be required. The Contractor, at its own expense, shall supply such labor and assistance as may be necessary in the handling of materials for proper inspection or for inspection of any Work done by it.
- 21.16 No verbal instructions given to the Contractor by the Owner, Project Representative or any of their agents shall change or modify the written Contract. Contractors shall make no claims for additional payments or time based upon verbal instructions.

## 22.00 SUBSURFACE CONDITIONS

- 22.01 It is understood and agreed that the Contractor is familiar with the subsurface conditions that will be encountered and its price bid for the Work includes all of the costs involved for Work in these conditions and it is furthermore agreed that it has taken into consideration, prior to its Bid and acceptance by Owner, all of the subsurface conditions normal or unusual that might be encountered in the location of the Work.
- 22.02 Should the Contractor encounter during the progress of the Work subsurface conditions at the site materially differing from those shown on the Drawings or indicated in the Specifications, the attention of the Owner shall be directed to such conditions before the

conditions are disturbed. If the Owner finds that the conditions materially differ from those shown on the Drawings or indicated in the Specifications, it shall at once make such changes in the Drawings or Specifications as it may find necessary, and any increase or decrease in cost or extension of time resulting from such changes shall be adjusted in the same manner as provided for changes for Extra Work. The Contractor shall submit breakdowns of all costs in a manner as instructed and approved by the Owner.

## 23.00 REMOVAL AND DISPOSAL OF STRUCTURES AND OBSTRUCTIONS

23.01 Bidder shall thoroughly examine the site of the Work and shall include in its Bid the cost of removing all structures and obstructions in the way of the Work.

23.02 The Contractor shall remove any existing structures or part of structures, fence, building or other encumbrances or obstructions that interfere in any way with the Work. Compensations for the removal of any structure shall be made only if the item(s) to be removed was/were listed as pay item(s) on the Proposal.

23.03 If called for in the Special Conditions, all privately and publicly owned materials and structures removed shall be salvaged without damage and shall be piled neatly and in an acceptable manner upon the premises if it belongs to an abutting property owner, otherwise at accessible points along the improvements. Materials in structures which is the property of the Owner or property of any public body, private body or individual which is fit for use elsewhere, shall remain property of the original Owner. It shall be carefully removed without damage, in sections which may be readily transported; same shall be stored on or beyond the right of way. The Contractor will be held responsible for the care and preservation for a period of ten (10) days following the day the last or final portion of the materials stored at a particular location are placed thereon. When privately owned materials are stored beyond the right of way, the Contractor will be held responsible for such care and preservation for a period of ten (10) days responsibility period for care and preservation of the materials begins. The Contractor must furnish the Owner with evidence satisfactory that the proper owner of the materials has been duly notified by the Contractor that the said owner must assume responsibility for its materials on the date following the Contractor's ten (10) day responsibility.

## 24.00 INSURANCE

24.01 Contractor shall secure and maintain at its expense such insurance that will protect it and the Parish from claims for injuries to persons or damages to property which may arise from or in connection with the performance of Services or Work hereunder by the Contractor, his agents, representatives, employees, and/or subcontractors. The cost of such insurance shall be included in Contractor's bid.

24.02 The Contractor shall not commence work until it has obtained all insurance as required for the Parish Project. If the Contractor fails to furnish the Parish with the insurance protection



required and begins work without first furnishing Parish with a currently dated certificate of insurance, the Parish has the right to obtain the insurance protection required and deduct the cost of insurance from the first payment due the Contractor. Further deductions are permitted from future payments as are needed to protect the interests of the Parish including, but not limited to, renewals of all policies.

- 24.03 Payment of Premiums: The insurance companies issuing the policy or policies shall have no recourse against the Parish of St. Tammany for payment of any premiums or for assessments under any form of policy.
- 24.04 Deductibles: Any and all deductibles in the described insurance policies shall be assumed by and be at the sole risk of the Contractor.
- 24.05 Authorization of Insurance Company(ies) and Rating: All insurance companies must be authorized to do business in the State of Louisiana and shall have an A.M. Best rating of no less than A-, Category VII.
- 24.06 Policy coverages and limits must be evidenced by Certificates of Insurance issued by Contractor's carrier to the Parish and shall reflect:

Date of Issue: Certificate must have current date.

Named Insured: The legal name of Contractor under contract with the Parish and its principal place of business shall be shown as the named insured on all Certificates of Liability Insurance.

Name of Certificate Holder: St. Tammany Parish Government, Office of Risk Management, P. O. Box 628, Covington, LA 70434

Project Description: A brief project description, including Project Name, Project Number and/or Contract Number, and Location.

Endorsements and Certificate Reference: All policies must be endorsed to provide, and certificates of insurance must evidence the following:

Waiver of Subrogation: The Contractor's insurers will have no right of recovery or subrogation against the Parish of St. Tammany, it being the intention of the parties that all insurance policy(ies) so affected shall protect both parties and be the primary coverage for any and all losses covered by the below described insurance. *Policy endorsements required for all coverages.*

Additional Insured: The Parish of St. Tammany shall be named as additional named insured with respect to general liability, marine liability, pollution/environmental liability, automobile liability and excess liability coverages. *Policy endorsements required.*

Hold Harmless: Contractor's liability insurers shall evidence their cognizance of the Hold Harmless and Indemnification in favor of St. Tammany Parish Government by referencing same on the face of the Certificate(s) of Insurance.

Cancellation Notice: Producer shall provide thirty (30) days prior written notice to the Parish of policy cancellation or substantive policy change.

24.07 The types of insurance coverage the Contractor is required to obtain and maintain throughout the duration of the Contract, include, but is not limited to:

1. Commercial General Liability insurance with a Combined Single Limit for bodily injury and property damage of at least \$2,000,000 per Occurrence/\$4,000,000 General Aggregate/Products-Completed Operations Per Project. The insurance shall provide for and the certificate(s) of insurance shall indicate the following coverages:
  - a) Premises - operations;
  - b) Broad form contractual liability;
  - c) Products and completed operations;
  - d) Personal Injury;
  - e) Broad form property damage;
  - f) Explosion and collapse.
2. Marine Liability/Protection and Indemnity insurance is required for any and all vessel and/or marine operations in the minimum limits of \$1,000,000 per occurrence/\$2,000,000 per project general aggregate. The coverage shall include, but is not limited to, the basic coverages found in the Commercial General Liability insurance and coverage for third party liability.
3. Contractors' Pollution Liability and Environmental Liability insurance in the minimum amount of \$1,000,000 per occurrence, \$2,000,000 general aggregate and include coverage for full contractual liability and for all such environmental and/or hazardous waste exposures affected by this project.
4. Business Automobile Liability insurance with a Combined Single Limit of \$1,000,000 per Occurrence for bodily injury and property damage, and shall include coverage for the following:
  - a) Any automobiles;
  - b) Owned automobiles;
  - c) Hired automobiles;
  - d) Non-owned automobiles;
  - e) Uninsured motorist.

5. Workers' Compensation/Employers Liability insurance: worker's compensation insurance coverage and limits as statutorily required; Employers' Liability Coverage shall be not less than \$1,000,000 each accident, \$1,000,000 each disease, \$1,000,000 disease policy aggregate, except when projects include exposures covered under the United States Longshoremen and Harbor Workers Act, Maritime and/or Jones Act and/or Maritime Employers Liability (MEL) limits shall be not less than \$1,000,000/\$1,000,000/\$1,000,000. *Coverage for owners, officers and/or partners shall be included in the policy and a statement of such shall be made by the insuring producer on the face of the certificate.*
  6. Owners Protective Liability (OPL) (formerly Owners and Contractors Protective Liability (OCP) Insurance) shall be furnished by the Contractor naming St. Tammany Parish Government as the Named Insured and shall provide coverage in the minimum amount of \$3,000,000 combined single limit (CSL) each occurrence, \$3,000,000 aggregate. Any project valued in excess of \$3,000,000 shall be set by the Office of Risk Management. The policy and all endorsements shall be addressed to St. Tammany Parish Government, Office of Risk Management, P. O. Box 628, Covington, LA 70434.
  7. Builder's Risk Insurance shall be required on buildings, sewage treatment plants and drainage pumping stations, and shall be written on an "all-risk" or equivalent policy form in the amount of the full value of the initial Contract sum, plus value of subsequent Contract modifications and cost of materials supplied or installed by others, comprising 100% total value for the entire project including foundations. Deductibles should not exceed \$5,000 and Contractor shall be responsible for any and all policy deductibles. This insurance shall cover portions of the work stored off the site, and also portions of the work in transit. In addition, Installation Floater Insurance, on an "all-risk" form, will be carried on all pumps, motors, machinery and equipment on the site or installed. Both the Builder's Risk Insurance and the Installation Floater Insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors and shall terminate only when the Project has been accepted. St. Tammany Parish Government, P. O. Box 628, Covington, LA 70434 shall be the first named insured on the Builder's Risk and Installation Floater Insurance.
  8. Professional Liability (errors and omissions) insurance in the sum of at least One Million Dollars (\$1,000,000) per claim with Two Million Dollars (\$2,000,000) annual aggregate.
  9. An umbrella policy or excess policy may be required and/or allowed to meet minimum coverage limits, subject to the review and approval by St. Tammany Parish Government, Office of Risk Management.
- 24.08 All policies of insurance shall meet the requirements of the Parish of St. Tammany prior to the commencing of any work. The Parish of St. Tammany has the right, but not the duty, to approve all insurance policies prior to commencing of any work. If at any time, it

becomes known that any of the said policies shall be or becomes unsatisfactory to the Parish of St. Tammany as to form or substance; or if a company issuing any such policy shall be or become unsatisfactory to the Parish of St. Tammany, the Contractor shall promptly obtain a new policy, timely submit same to the Parish of St. Tammany for approval and submit a certificate thereof as provided above. The Parish agrees to not unreasonably withhold approval of any insurance carrier selected by Contractor. In the event that Parish cannot agree or otherwise authorize said carrier, Contractor shall have the option of selecting and submitting new insurance carrier within 30 days of said notice by the Parish. In the event that the second submission is insufficient or is not approved, then the Parish shall have the unilateral opportunity to thereafter select a responsive and responsible insurance carrier all at the cost of Contractor and thereafter deduct from Contractor's fee the cost of such insurance.

- 24.09 Upon failure of Contractor to furnish, deliver and/or maintain such insurance as above provided, the contract, at the election of the Parish of St. Tammany, may be forthwith declared suspended, discontinued or terminated. Failure of the Contractor to maintain insurance shall not relieve the Contractor from any liability under the contract, nor shall the insurance requirements be construed to conflict with the obligation of the Contractor concerning indemnification.
- 24.10 Contractor shall maintain a current copy of all annual insurance policies and provide same to the Parish of St. Tammany as may be reasonably requested.
- 24.11 It shall be the responsibility of Contractor to require that these insurance requirements are met by all contractors and sub-contractors performing work for and on behalf of Contractor. Contractor shall further ensure the Parish is named as additional insured on all insurance policies provided by said contractor and/or sub-contractor throughout the duration of the project, and that renewal certificates for any policies expiring prior to the Parish's final acceptance of the project shall be furnished to St. Tammany Parish Government, Department of Legal, Office of Risk Management, without prompting.

**NOTICE:**

*These are only an indication of the coverages that are generally required. Additional coverages and/or limits may be required for projects identified as having additional risks or exposures. Please note that some requirements listed may not necessarily apply to your specific services. St. Tammany Parish Government reserves the right to remove, replace, make additions to and/or modify any and all of the insurance requirement language upon review of the final scope of services presented to Office of Risk Management prior to execution of a contract for services.*

**For inquiries regarding insurance requirements, please contact:**

**St. Tammany Parish Government  
Office of Risk Management  
P. O. Box 628  
Covington, LA 70434  
Telephone: 985-898-5226  
Email: [riskman@stpgov.org](mailto:riskman@stpgov.org)**

24.12 Nothing contained in these insurance requirements is to be construed as limiting the extent of the Contractor's Responsibility for payment of damages resulting from its operations under this Contract.

**25.00 OWNER'S RIGHT TO OCCUPANCY**

25.01 The Owner shall have the right to use, at any time, any and all portions of the Work that have reached such a stage of completion as to permit such occupancy, provided such occupancy does not hamper the Contractor or prevent its efficient completion of the Contract or be construed as constituting an acceptance of any part of the Work.

25.02 The Owner shall have the right to start the construction of houses, structures or any other building concurrent with the Contractor's Work.

**26.00 SURVEY HORIZONTAL AND VERTICAL CONTROL**

26.01 The Owner shall provide surveys for construction to establish reference points which in its judgment are necessary to enable Contractor to layout and proceed with its Work. Contractor shall be responsible for surveying and laying out the Work and shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of the Owner. Contractor shall report to Owner whenever any reference point is lost or destroyed and the Owner shall decide if the reference point shall be replaced by its or the Contractor's forces.

- 26.02 The Contractor shall establish lines and grades with its own forces in sufficient number and location for the proper execution of the Work.
- 26.03 If the Contractor, during the construction, damages the established property corners and/or other markers and thereafter requests the Owner to re-stake same in order to complete the project, this expense will be borne solely by the Contractor.
- 27.00 TERMINATION OF THE CONTRACT, OWNER'S AND CONTRACTORS RIGHT TO STOP WORK.
- 27.01 If the Contractor should be adjudged bankrupt (voluntarily or involuntarily) or if it should make a general assignment for the benefit of its creditors, or if a receiver should be appointed on account of its insolvency, or if it should persistently or repeatedly refuse or should fail (except in cases for which extension of time is provided) to supply enough properly skilled workmen or proper materials, or if it should fail to make prompt payment to Subcontractors or for material or labor, or persistently disregard laws, ordinances or the instructions of the Owner, or otherwise be guilty of a substantial violation of any provision of the Contract, then the Owner, upon the certificate of the Owner that, in its unilateral discretion and judgment, believes sufficient cause exists to justify such action, may, without prejudice to any other right or remedy and after giving the Contractor ten (10) calendar days written notice, terminate the employment of the Contractor and take possession of the premises and of all materials, tools and appliances thereon and finish the Work by whatever method the Owner may deem expedient.
- 27.02 Failure of the Contractor to start the Work within the time limit specified herein or substantial evidence that the progress being made by the Contractor is sufficient to complete the Work within the specified time shall be grounds for termination of the Contract by the Owner.
- 27.03 Before the Contract is terminated, the Contractor and its surety will first be notified in writing by the Owner of the conditions which make termination of the Contract imminent. When after ten (10) calendar days' notice is given and if satisfactory effort has not been made by the Contractor or its surety to correct the conditions, the Owner may declare, in its exclusive discretion, that the Contract is terminated and so notify the Contractor and its surety accordingly.
- 27.04 Upon receipt of notice from the Owner that the Contract has been terminated, the Contractor shall immediately discontinue all operations. The Owner may then proceed with the Work in any lawful manner that it may elect until Work is finally completed.
- 27.05 The exclusive right is reserved to the Owner to take possession of any machinery, implements, tools or materials of any description that shall be found upon the Work, to account for said equipment and materials, and to use same to complete the Project. When the Work is finally completed, the total cost of same will be computed. If the total cost is less than the Contract Price, the difference will not be paid to the Contractor or its surety.

- 27.06 In case of termination, all expenses incident to ascertaining and collecting losses under the Bond, including legal services, shall be assessed against the Bond.
- 27.07 If the Work should be stopped under any order of any court or public authority for period of sixty (60) calendar days, through no act or fault of the Contractor or anyone employed by it, or if the Owner shall fail to pay the Contractor within a reasonable time any sum certified by the Owner, then the Contractor may, upon ten (10) calendar days written notice to the Owner, stop Work or terminate this Contract and recover from the Owner payment for all Work properly and professionally executed in a workmanlike manner. This loss specifically includes actual cost of materials and equipment, together with all wages inclusive of all federal, state, and local tax obligations. This loss specifically includes reimbursement of all insurances on a pro-rata basis from the date of termination to date of policy period. This loss excludes and specifically does not include recovery by the Contractor for lost profit, indirect & direct expenses, overhead, and the like.

#### 28.00 PAYMENTS TO THE CONTRACTOR

- 28.01 Monthly certificates for partial payment, in a form approved by the Owner, shall be transmitted to the Owner upon receipt from the Contractor and acceptance by the Owner. In accordance with LSA-R.S. 38:2248(A), when the Contract Price is less than five hundred thousand dollars, these certificates shall be equal to ninety percent (90%) of both the Work performed and materials stored at the site; and when the Contract Price is five hundred thousand dollars or more, these certificates shall be equal to ninety-five percent (95%) of both the Work performed and materials stored at the site. Partial payment certificates shall include only Work, materials and equipment that are included in official Work Order and which meet the requirements of plans, Specifications and Contract Documents. These monthly estimates shall show the amount of the original estimate for each item, the amount due on each item, the gross total, the retained percentage, the amount previously paid and the net amount of payment due.
- 28.02 After final completion and acceptance by the Owner of the entire Work, and when the Contract Price is less than five hundred thousand dollars, the Owner shall issue to the Contractor Certificate of Payment in sum sufficient to increase total payments to ninety percent (90%) of the Contract Price. After final completion and acceptance by the Owner of the entire Work, and when the Contract Price is five hundred thousand dollars or more, the Owner shall issue to the Contractor Certificate of Payment in sum sufficient to increase total payments to ninety-five percent (95%) of the Contract Price.
- 28.03 When the Contract Price is less than five hundred thousand dollars, the final payment certificate of the remaining ten percent (10%) of the Contract Price, minus any deduction for deficient or Defective Work or other applicable deductions, will be issued by the Owner forty-five (45) days after filing acceptance in the Mortgage Office of the Parish and a Clear Liens and Privilege Certificate has been secured. When the Contract Price is five hundred thousand dollars or more, the final payment certificate of the remaining five percent (5%)

of the Contract Price, minus any deduction for deficient or Defective Work or other applicable deductions, will be issued by the Owner forty-five (45) days after filing acceptance in the Mortgage Office of the Parish and a Clear Liens and Privilege Certificate has been secured. Before issuance of the final payment certificate, the Contractor shall deposit with the Owner a certificate from the Clerk of Court and Ex-Officio Recorder of Mortgages from the Parish in which the Work is performed to the effect that no liens have been registered against Contract Work.

- 28.04 When, in the opinion of the Contractor, the Work provided for and contemplated by the Contract Documents has been substantially completed, the Contractor shall notify the Owner in writing that the Work is substantially complete and request a final inspection. The Owner shall proceed to perform such final inspection accompanied by the Contractor. Any and all Work found by this inspection to be Defective or otherwise not in accordance with the plans and Specifications shall be corrected to the entire satisfaction of the Owner and at the sole expense of the Contractor. If the Contract is found to be incomplete in any of its details, the Contractor shall at once remedy such defects, and payments shall be withheld and formal acceptance delayed until such Work has been satisfactorily completed.
- 28.05 If payment is requested on the basis of materials and equipment not incorporated in the Work, but delivered and suitably stored and protected from damage and theft at the site, the Request for Payment shall also be accompanied by such data, satisfactory to the Owner, as will establish Owner's title to the material and equipment and protect its interest therein, including applicable insurance.
- 28.06 Each subsequent Request for Payment shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied to discharge in full all of Contractor's obligations reflected in prior Request for Payment.
- 28.07 Each subsequent request for payment shall include an affidavit by Contractor that Contractor, all subcontractors, agents, material suppliers and all other persons supplying material to the project upon which State of Louisiana and/or St. Tammany sales taxes are lawfully due have paid these taxes and that all supplies and materials purchased for this project and for which Contractor has been paid have had all lawfully due State and/or St. Tammany sales taxes paid.
- 28.08 The Bid Proposal, unless otherwise modified in writing, and the Contract constitute the complete Project. The Contract Prices constitute the total compensation payable to Contractor and the cost of all of the Work and materials, taxes, permits and incidentals must be included into the Bid submitted by the Contractor and included into those items listed on the Proposal.
- 28.09 Any additional supporting data required by the Owner in order to substantiate Contractor's request for payment shall be furnished by Contractor at no cost to the Owner.
- 28.10 Owner may withhold from payment to Contractor as may be necessary to protect itself from loss on account of:



- (1) Defective and/or inferior work;
- (2) Damage to the property of Owner or others caused by Contractor;
- (3) Failure by Contractor to make payments properly to sub-contractors or to pay for labor, materials or equipment used on this project;
- (4) Failure by Contractor to pay taxes due on materials used on this project;
- (5) Damage by Contractor to another Contractor;
- (6) Insolvency;
- (7) Bankruptcy, voluntary or involuntary;
- (8) Revocation of corporate status;
- (9) Failure to follow corporate formalities;
- (10) Unprofessional activities;
- (11) Unworkmanlike performance;
- (12) Fraud and/or misrepresentation of any kind.

#### 29.00 ACCEPTANCE AND FINAL PAYMENT(S)

- 29.01 Upon receipt of written notice from Contractor that the work is substantially complete and usable by Owner or the Public in suitable manner, the Owner and the Contractor shall jointly inspect the work.
- 29.02 If the Owner by inspection determines that the work is not substantially complete in a suitable manner for use by the Owner or the Public, then the Owner shall so notify the Contractor in writing stating such reason. All reasons need not be disclosed unless actually known. The Owner is afforded an opportunity to amend said notices as are reasonably possible.
- 29.03 If the Owner by its inspection determines that the work is substantially complete, it shall prepare a list of all items not satisfactorily completed and shall notify the Contractor and Owner in writing that the work is substantially complete and subject to satisfactory resolution of those items on the list (punch list). Punch lists may be amended from time to time by Owner in the event that additional deficiencies are discovered. In accordance with LSA-R.S. 38:2248(B), any punch list generated during a construction project shall include the cost estimates for the particular items of work the design professional has developed based on the mobilization, labor, material, and equipment costs of correcting each punch list item. The design professional shall retain his working papers used to determine the punch list items cost estimates should the matter be disputed later. The contract agency shall not withhold from payment more than the value of the punch list. Punch list items completed shall be paid upon the expiration of the forty-five (45) day lien period. The provisions of this Section shall not be subject to waiver.
- 29.04 Upon determination of substantial completeness with the punch list, the Contract Time is interrupted and the Contractor is given a reasonable time not to exceed thirty (30) consecutive calendar days to effect final completion by correcting or completing all of those items listed on the punch list. If the items on the punch list are not completed in a satisfactory manner within the thirty day period, then the Contract Time will begin to run

again and will include for purposes of determining liquidated damages the thirty day period the grace period being withdrawn.

- 29.05 Upon receipt by Owner of written determination that all work embraced by the contract has been completed in a satisfactory manner, the Owner shall provide a written acceptance to Contractor who shall record Owner's written acceptance with the recorder of Mortgages, St. Tammany Parish. The Contractor shall properly prepare, submit and pay for all costs associated with said Acceptance. The Contractor is also responsible for preparation, re-submission and payment of any and all updated certificates.
- 29.06 Retainage monies, minus those funds deducted in accordance to the requirements of this agreement including but not limited to Paragraph 28.10, shall be due Contractor not earlier than forty-six (46) calendar days after recordation of certificate of Owner's acceptance provided the following:
- (1) Contractor shall prepare, secure, pay for and submit clear lien and privilege certificate, signed and sealed by Clerk of Court or Recorder of Mortgages, Parish of St. Tammany and dated at least forty-six (46) days after recordation of certificate of acceptance;
  - (2) Ensure that the official representative of the Owner has accepted as per LSA-R.S. 38:2241.1, *et seq.* and that all following sub-sections have been properly satisfied as per law;
  - (3) Ensure that all signatures are affixed and that there exists the requisite authority for all signatures;
  - (4) Ensure accurate and proper legal descriptions;
  - (5) Properly identify all parties and/or signatories;
  - (6) Properly identify all mailing addresses;
  - (7) Correctly set for the amount of the contract, together with all change orders;
  - (8) Set out a brief description of the work performed;
  - (9) Reference to any previously recorded contract, lien or judgment inscription that may affect the property;
  - (10) Certification that substantial completion has occurred, together with any applicable date(s);
  - (11) Certification that no party is in default and/or that the project has been abandoned.

29.07 After securing the clear lien and privilege certificate the Contractor shall prepare its final application for payment and submit to Owner. The Owner shall approve application for payment, or state its objections in writing and forward to Contractor for resolution.

### 30.00 NOTICE AND SERVICE THEREOF

30.01 Any Notice to Contractor from the Owner relative to any part of this Contract shall be in writing and shall be considered delivered and the service thereof completed when said notice is posted; by certified mail, return receipt requested to the said Contractor at its last given address, or delivered in person to said Contractor or its authorized representative on the Work.

### 31.00 INTENTION OF THESE GENERAL CONDITIONS

31.01 These General Conditions shall be applicable to all contracts entered into by and between the Owner and Contractors, except as may be altered or amended with the consent of the Owner, and/or provided for in the Special Conditions of each contract. Contractor shall be presumed to have full knowledge of these General Conditions which shall be applicable to all contracts containing these General Conditions, whether Contractor has obtained a copy thereof or not.

### 32.00 SEVERABILITY

32.01 If any one or more or part of any of the provisions contained herein and/or in the Specifications and Contract for the Work shall for any reason be held invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provisions of this Agreement or attachment, but it shall be construed as if such invalid, illegal, or unenforceable provision or part of a provision had never been contained herein.

32.02 CHANGING THESE CONDITIONS: Owner reserves the right to change or modify these General Conditions as it deems best, or as required by law. The General Conditions may also be modified for a particular project by the use of Special Conditions prior to the issuance of the Advertisement for Bid. However, once an advertisement for bid is made for any specific project, any changes to the General Conditions as they affect that specific project must be made in writing and issued via an addendum in accordance with State Law.

### 33.00 LAW OF THE STATE OF LOUISIANA

33.01 The Contract Documents shall be governed by the Law of the State of Louisiana.

33.02 The Contractor agrees to pay reasonable attorney's fees and other reasonable attendant

costs, in the event that it becomes necessary for the Owner to employ an attorney in order to enforce compliance with or any remedy relating to any covenants, obligations, or conditions imposed upon the Contractor by this Agreement. Attorney fees shall be based upon the prevailing hourly rate of attorney rates in the private sector. In no case shall the hourly rate be less than \$175.00 per hour. All attorney fees collected shall be paid the operating budget of the Office of the Parish President.

- 33.03 The jurisdiction and venue provisions shall apply to all contractors, sureties, and subcontractors. The 22nd Judicial District for the Parish of St. Tammany shall be the court of exclusive jurisdiction and venue for any dispute arising from these General Conditions and/or any contract executed in conjunction with these General Conditions. All parties specifically waive any rights they have or may have for removal of any disputes to Federal Court, or transfers to different State District Court.
- 33.04 Contractor warrants that it has and/or had received a copy of these General Conditions at all times material hereto; Contractor further agrees that it has read and fully and completely understands each and every condition herein.
- 33.05 The property description will be more fully set out by an attached exhibit.
- 33.06 The Contractor warrants that it has the requisite authority to sign and enter this agreement.
- 33.07 It is specifically understood and agreed that in the event Contractor seeks contribution from the Parish or pursues its legal remedies for any alleged breach of this agreement by the Parish, then the following list of damages SHALL NOT BE RECOVERABLE BY CONTRACTOR. This list includes, but is not limited to:
1. indirect costs and/or expenses;
  2. direct costs and/or expenses;
  3. time-related costs and/or expenses;
  4. award of extra days;
  5. costs of salaries or other compensation of Contractor's personnel at Contractor's principal office and branch offices;
  6. expenses of Contractor's principal, branch and/or field offices;
  7. any part of Contractor's capital expenses, including any interest on Contractor's capital employed for the work;
  8. any other charges related to change orders;
  9. overhead and general expenses of any kind or the cost of any item not specifically and expressly included in Cost of Work.

33.08 DEFAULT AND WAIVERS

It is understood that time is of the essence. It is specifically understood between the parties that Contractor waives any and all notice to be placed in default by the Owner. This subsection shall supersede and prime any other subsection herein above that is in conflict. The Owner specifically reserves its right and specifically does not waive the requirement

to be placed in default by the Contractor as per law.

33.09 St. Tammany Parish Government contracts to be awarded are dependent on the available funding and/or approval by members designated and/or acknowledged by St. Tammany Parish Government. At any time St. Tammany Parish Government reserves the right to cancel the award of a contract if either or both of these factors is deficient.

33.10 It is the Parish's policy to provide a method to protest exclusion from a competition or from the award of a contract, or to challenge an alleged solicitation irregularity. It is always better to seek a resolution within the Parish system before resorting to outside agencies and/or litigation to resolve differences. All protests must be made in writing, and shall be concise and logically presented to facilitate review by the Parish. The written protest shall include:

1. The protester's name, address, and fax and telephone numbers and the solicitation, bid, or contract number;
2. A detailed statement of its legal and factual grounds, including a description of the resulting prejudice to the protester;
3. Copies of relevant documents;
4. All information establishing that the protester is an interested party and that the protest is timely; and
5. A request for a ruling by the agency; and a statement of the form of relief requested.

The protest shall be addressed to Director of Procurement, St. Tammany Parish Government, P.O. Box 628, Covington, LA 70434.

The protest review shall be conducted by the Parish Procurement Department.

Only protests from interested parties will be allowed. Protests based on alleged solicitation improprieties that are apparent before bid opening, or the time set for receipt of initial proposals must be filed with and received by the Procurement Department BEFORE those deadlines.

Any other protest shall be filed no later than ten (10) calendar days after the basis of the protest is known, or should have been known (whichever is earlier).

The Parish will use its best efforts to resolve the protest within thirty (30) days of the date that it is received by the Parish. The written response will be sent to the protestor via mail and, fax, if a fax number has been provided by the protestor. The protester can request additional methods of notification.

Last day to submit questions and/or verification on comparable products will be no later

than 2:00 pm CST, seven (7) working days prior to the opening date of the bid/proposal due date. Further any questions or inquires must be submitted via fax to 985-898-5227, or via email to [Procurement@stpgov.org](mailto:Procurement@stpgov.org). Any questions or inquires received after the required deadline to submit questions or inquires will not be answered.

**Section 09**

**Sample Corporate Resolution**

# Section 09

## CORPORATE RESOLUTION

EXCERPT FROM MINUTES OF MEETING OF THE BOARD OF DIRECTORS OF INCORPORATED.

AT THE MEETING OF DIRECTORS OF \_\_\_\_\_ INCORPORATED, DULY NOTICED AND HELD ON \_\_\_\_\_, A QUORUM BEING THERE PRESENT, ON MOTION DULY MADE AND SECONDED. IT WAS:

RESOLVED THAT \_\_\_\_\_, BE AND IS HEREBY APPOINTED, CONSTITUTED AND DESIGNATED AS AGENT AND ATTORNEY-IN-FACT OF THE CORPORATION WITH FULL POWER AND AUTHORITY TO ACT ON BEHALF OF THIS CORPORATION IN ALL NEGOTIATIONS, BIDDING, CONCERNS AND TRANSACTIONS WITH THE PARISH OF ST. TAMMANY OR ANY OF ITS AGENCIES, DEPARTMENTS, EMPLOYEES OR AGENTS, INCLUDING BUT NOT LIMITED TO, THE EXECUTION OF ALL BIDS, PAPERS, DOCUMENTS, AFFIDAVITS, BONDS, SURETIES, CONTRACTS AND ACTS AND TO RECEIVE ALL PURCHASE ORDERS AND NOTICES ISSUED PURSUANT TO THE PROVISIONS OF ANY SUCH BID OR CONTRACT, THIS CORPORATION HEREBY RATIFYING, APPROVING, CONFIRMING, AND ACCEPTING EACH AND EVERY SUCH ACT PERFORMED BY SAID AGENT AND ATTORNEY-IN-FACT.

I HEREBY CERTIFY THE FOREGOING TO BE A TRUE AND CORRECT COPY OF AN EXCERPT OF THE MINUTES OF THE ABOVE DATED MEETING OF THE BOARD OF DIRECTORS OF SAID CORPORATION, AND THE SAME HAS NOT BEEN REVOKED OR RESCINDED.

SECRETARY-TREASURER

\_\_\_\_\_

DATE

\_\_\_\_\_



**Section 10**

**Sample Certificate of Insurance**

## Section 10

### Certificate of Insurance Instructions

The below information is intended to guide Contractors on what information is needed to be listed on the Certificate of Insurance. All Insurance limit requirements can be found in Attachment D.

- **Certificate Holder** – STPG must be listed as the certificate holder, and it must include our address of: P.O. Box 628, Covington, LA 70434
  - Reason: the certificate holder is where cancellations of coverage, or updated certificates are mailed. If a vendor terminates a policy, we will be notified.
- **Additional Insured** – We must be named as an additional insured so that if there is a lawsuit against the vendor for a project, their coverage will cover STPG as well if we are named in the lawsuit.
  - We must be named in the Description of Operations box – reason: there could be other additional insureds, and we want to have no doubt that we are one of the additional insureds.
  - We must be named as additional insured on the following coverages: General liability, Auto Liability, Umbrella/Excess Liability, Environmental/Pollution Liability.
  - Professional Liability policies do not allow for an additional insured by most carriers.
- **Project Name & Contract #** - We need this listed in the Description of Operations, again so that if there is a lawsuit, we have proof that coverage was active for that project.
- **Waiver of Subrogation** – This can either be listed in the Description of Operations or checked off in the appropriate columns.

From the Insurance Requirement form:

*Waiver of Subrogation: The Provider's insurers will have no right of recovery or subrogation against the Parish of St. Tammany, it being the intention of the parties that all insurance policy(ies) so affected shall protect both parties and be the primary coverage for any and all losses covered by the below described insurance.*

- **Owners Protective Liability (OPL) or (OCP)** – Certificate of Insurance for OCP names St. Tammany Parish Government as the Insured and the Certificate Holder.
- Sample of Certificate of Insurance (COI) can be found on page 2.
- Please refer to this section in the package labeled “Insurance Requirements” for limits required for this project

Any questions regarding insurance requirements please contact the Risk Department at 985-898-5226 or email [riskman@stpgov.org](mailto:riskman@stpgov.org)



# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

**IMPORTANT:** If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:		
	PHONE (A/C, No. Ext):	FAX (A/C, No):	
	E-MAIL ADDRESS:		
	INSURER(S) AFFORDING COVERAGE		NAIC #
INSURED	INSURER A :		
	INSURER B :		
	INSURER C :		
	INSURER D :		
	INSURER E :		
	INSURER F :		

**COVERAGES**

CERTIFICATE NUMBER:

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
	<b>GENERAL LIABILITY</b>						EACH OCCURRENCE \$
	<input type="checkbox"/> COMMERCIAL GENERAL LIABILITY						DAMAGE TO RENTED PREMISES (Ea occurrence) \$
	<input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> OCCUR						MED EXP (Any one person) \$
							PERSONAL & ADV INJURY \$
							GENERAL AGGREGATE \$
	GEN'L AGGREGATE LIMIT APPLIES PER:						PRODUCTS - COMP/OP AGG \$
	<input type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC						\$
	<b>AUTOMOBILE LIABILITY</b>						COMBINED SINGLE LIMIT (Ea accident) \$
	<input type="checkbox"/> ANY AUTO						BODILY INJURY (Per person) \$
	<input type="checkbox"/> ALL OWNED AUTOS	<input type="checkbox"/>	<input type="checkbox"/>				BODILY INJURY (Per accident) \$
	<input type="checkbox"/> HIRED AUTOS	<input type="checkbox"/>	<input type="checkbox"/>				PROPERTY DAMAGE (Per accident) \$
							\$
	<b>UMBRELLA LIAB</b>						EACH OCCURRENCE \$
	<input type="checkbox"/> OCCUR						AGGREGATE \$
	<b>EXCESS LIAB</b>						\$
	<input type="checkbox"/> CLAIMS-MADE						
	DED						
	RETENTION \$						
	<b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b>						WC STATUTORY LIMITS
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH)						OTHER
	If yes, describe under DESCRIPTION OF OPERATIONS below	<input type="checkbox"/> Y / <input type="checkbox"/> N	<input type="checkbox"/> N / <input type="checkbox"/> A				E.L. EACH ACCIDENT \$
							E.L. DISEASE - EA EMPLOYEE \$
							E.L. DISEASE - POLICY LIMIT \$

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

Project Name:  
Contract #:

(Name St. Tammany Parish Government as an additional insured).

**CERTIFICATE HOLDER****CANCELLATION**St. Tammany Parish Government  
P.O. Box 628  
Covington, LA 70434

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

**Section 11**  
**Federal Clauses**

# Section 11

## AMERICAN RESCUE PLAN ACT FEDERAL CONTRACT CLAUSES

Since the parties anticipate that federal funding will be applied to this Agreement, the following federal contract clauses must be complied with, where applicable, in addition to the clauses already mentioned.

### 1. EQUAL EMPLOYMENT OPPORTUNITY

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

(1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

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

(3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.

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

(5) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(6) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(8) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

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

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

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon

contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or

refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

**2. DAVIS-BACON ACT,** as amended (40 U.S.C. 3141-3148). When required by Federal program legislation, all prime construction contracts in excess of \$10,000,les000 awarded by non-Federal entities must include a provision for compliance with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, “Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction”). In accordance with the statute, contractors must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week. The non-Federal entity must place a copy of the current prevailing wage determination issued by the Department of Labor in each solicitation. The decision to award a contract or subcontract must be conditioned upon the acceptance of the wage determination. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency. The contracts must also include a provision for compliance with the Copeland “Anti-Kickback” Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, “Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States”). The Act provides that each contractor or subrecipient must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency.

### **3. COMPLIANCE WITH THE CONTRACT WORK HOURS AND SAFETY STANDARDS ACT.**

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

(2) *Violation; liability for unpaid wages; liquidated damages.* In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of \$27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

(3) *Withholding for unpaid wages and liquidated damages.* The Parish shall upon its own action or upon written request of an authorized representative of the Department of Labor or U.S. Treasury withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or

any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) *Subcontracts*. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

#### **4. RIGHTS TO INVENTIONS MADE UNDER A CONTRACT OR AGREEMENT**

If the Federal award meets the definition of “funding agreement” under 37 CFR § 401.2 (a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that “funding agreement,” the recipient or subrecipient must comply with the requirements of 37 CFR Part 401, “Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements,” and any implementing regulations issued by the awarding agency.

#### **5. CLEAN AIR ACT**

(1) The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 *et seq.*

(2) The Contractor agrees to report each violation to the Parish and understands and agrees that the Parish will, in turn, report each violation as required to assure notification to the federal awarding agency, and the appropriate Environmental Protection Agency Regional Office.

(3) The Contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with Federal assistance provided by ARPA.

#### **6. FEDERAL WATER POLLUTION CONTROL ACT**

(1) The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 7401 *et seq.*

(2) The Contractor agrees to report each violation to the Parish and understands and agrees that the Parish will, in turn, report each violation as required to assure notification to the Federal awarding agency, and the appropriate Environmental Protection Agency Regional Office.

(3) The Contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with Federal assistance provided by ARPA.

#### **7. SUSPENSION AND DEBARMENT**

(1) This contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such, the contractor is required to verify that none of the contractor’s principals (defined at 2 C.F.R. § 180.995) or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).



(2) The contractor must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.

(3) This certification is a material representation of fact relied upon by the Parish. If it is later determined that the contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to the Parish, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

(4) The bidder or proposer agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

## **8. BYRD ANTI-LOBBYING ACT**

The Contractor will be expected to comply with Federal statutes required in the Anti-Lobbying Act.

Contractors who apply or bid for an award of more than \$100,000 shall file the required certification. Each tier certifies to the tier above that it will not and has not used federally appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the federal awarding agency.

## **9. PROCUREMENT OF RECOVERED MATERIALS**

In the performance of this Contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired—

- i. Competitively within a timeframe providing for compliance with the Contract performance schedule;
- ii. Meeting Contract performance requirements; or
- iii. At a reasonable price.

Information about this requirement, along with the list of EPA-designate items, is available at EPA's Comprehensive Procurement Guidelines web site, <https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>.

## **10. PROHIBITION ON CONTRACTING FOR COVERED TELECOMMUNICATIONS EQUIPMENT OR SERVICES.**

(a) *Definitions.* As used in this clause, the terms backhaul; covered foreign country; covered telecommunications equipment or services; interconnection arrangements; roaming; substantial or essential component; and telecommunications equipment or services have the meaning as defined in Public Law 115-232, section 889, Prohibitions on Expending ARPA Award Funds for Covered Telecommunications Equipment or Services (Interim), as used in this clause—

(b) *Prohibitions.*

(1) Section 889(b) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. No. 115-232, and 2 C.F.R. § 200.216 prohibit the head of an executive agency on or after Aug. 13, 2020, from obligating or expending grant, cooperative agreement, loan, or loan guarantee funds on certain telecommunications products or from certain entities for national security reasons.

(2) Unless an exception in paragraph (c) of this clause applies, the contractor and its subcontractors may not use grant, cooperative agreement, loan, or loan guarantee funds from a federal Agency to:

(i) Procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system;

(ii) Enter into, extend, or renew a contract to procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system;

(iii) Enter into, extend, or renew contracts with entities that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system as described in Public Law 115-232, section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities). (a) For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities). (bi) Telecommunications or video surveillance services provided by such entities or using such equipment. (c) Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country; or

(iv) Provide, as part of its performance of this contract, subcontract, or other contractual instrument, any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system.

(3) In implementing the prohibition under Public Law 115-232, section 889, subsection (f), paragraph (1), heads of executive agencies administering loan, grant, or subsidy programs shall prioritize available funding and technical support to assist affected businesses, institutions and organizations as is reasonably necessary for those affected entities to transition from covered communications equipment and services, to procure replacement equipment and services, and to ensure that communications service to users and customers is sustained.

(4) See Public Law 115-232, section 889 for additional information.

(5) See also § 200.471.

(c) *Exceptions.*

(1) This clause does not prohibit contractors from providing—

(i) A service that connects to the facilities of a third-party, such as backhaul, roaming, or interconnection arrangements; or

(ii) Telecommunications equipment that cannot route or redirect user data traffic or permit visibility into any user data or packets that such equipment transmits or otherwise handles.

(2) By necessary implication and regulation, the prohibitions also do not apply to:

(i) Covered telecommunications equipment or services that:

i. Are *not used* as a substantial or essential component of any system; *and*

ii. Are *not used* as critical technology of any system.

(ii) Other telecommunications equipment or services that are not considered covered telecommunications equipment or services.

(d) *Reporting requirement.*

(1) In the event the contractor identifies covered telecommunications equipment or services used as a substantial or essential component of any system, or as critical technology as part of any system, during contract performance, or the contractor is notified of such by a subcontractor at any tier or by any other source, the contractor shall report the information in paragraph (d)(2) of this clause to the recipient or subrecipient, unless elsewhere in this contract are established procedures for reporting the information.

(2) The Contractor shall report the following information pursuant to paragraph (d)(1) of this clause:

(i) Within one business day from the date of such identification or notification: The contract number; the order number(s), if applicable; supplier name; supplier unique entity identifier (if known); supplier Commercial and Government Entity (CAGE) code (if known); brand; model number (original equipment manufacturer number, manufacturer part number, or wholesaler number); item description; and any readily available information about mitigation actions undertaken or recommended.

(ii) Within 10 business days of submitting the information in paragraph (d)(2)(i) of this clause: Any further available information about mitigation actions undertaken or recommended. In addition, the contractor shall describe the efforts it undertook to prevent use or submission of covered telecommunications equipment or services, and any additional efforts that will be incorporated to prevent future use or submission of covered telecommunications equipment or services.

(e) *Subcontracts.* The Contractor shall insert the substance of this clause, including this paragraph (e), in all subcontracts and other contractual instruments.

## **11. DOMESTIC PREFERENCES FOR PROCUREMENTS.**

As appropriate, and to the extent consistent with law, the contractor should, to the greatest extent practicable, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States. This includes, but is not limited to iron, aluminum, steel, cement, and other manufactured products.

For purposes of this clause:

*Produced in the United States* means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

*Manufactured products* mean items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

## **12. COMPLIANCE WITH FEDERAL EXECUTIVE ORDERS**

This is an acknowledgement that American Rescue Plan Act will be used to fund the Contract only. The Contractor will comply with all applicable federal law, regulations, executive orders, policies, procedures, and directives.

## **13. NO OBLIGATION BY THE FEDERAL GOVERNMENT**

The Federal Government is not a party to this Contract and is not subject to any obligations or liabilities to the non-Federal entity, Contractor, or any other party pertaining to any matter resulting from the Contract.

## **14. PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS OR RELATED ACTS**

The Contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the Contractor's actions pertaining to this contract.

## **15. CONTRACTING WITH SMALL AND MINORITY BUSINESSES, WOMEN'S BUSINESS ENTERPRISES, AND LABOR SURPLUS AREA FIRMS.**

(a) Any party to this contract must take all necessary affirmative steps to assure that minority businesses, women's business enterprises, and labor surplus area firms are used when possible. These steps are also required for the hiring of any subcontractors under this contract.

(b) Affirmative steps must include:

(1) Placing qualified small and minority businesses and women's business enterprises on solicitation lists;

(2) Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;

(3) Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;

(4) Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises; and

(5) Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

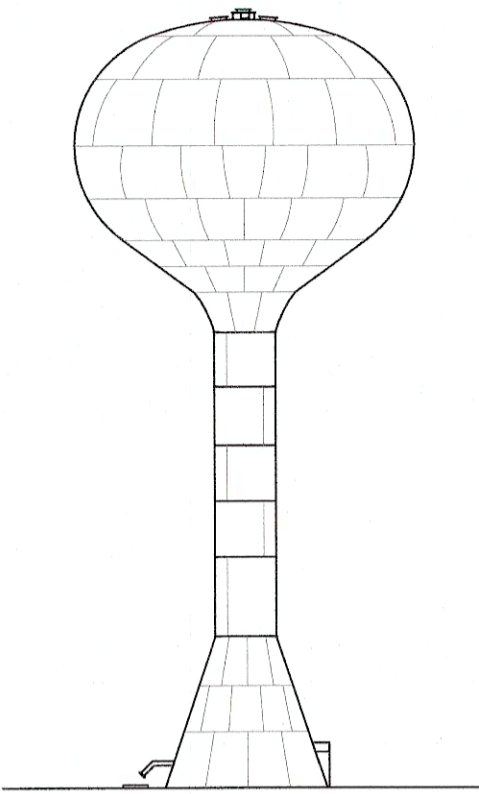
## **16. COPYRIGHT AND DATA RIGHTS**

The Contractor grants to the Parish, a paid-up, royalty-free, nonexclusive, irrevocable, worldwide license in data first produced in the performance of this contract to reproduce, publish, or otherwise use, including prepare derivative works, distribute copies to the public, and perform publicly and display publicly such data. For data required by the contract but not first produced in the performance of this

contract, the Contractor will identify such data and grant to the Parish or acquires on its behalf a license of the same scope as for data first produced in the performance of this contract. Data, as used herein, shall include any work subject to copyright under 17 U.S.C. § 102, for example, any written reports or literary works, software and/or source code, music, choreography, pictures or images, graphics, sculptures, videos, motion pictures or other audiovisual works, sound and/or video recordings, and architectural works. Upon or before the completion of this contract, the Contractor will deliver to the Parish data first produced in the performance of this contract and data required by the contract but not first produced in the performance of this contract in formats acceptable by the Parish.

## **Section 12**

### **Plans**



### INDEX TO SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	GENERAL NOTES, VICINITY MAPS, LEGEND, AND CONTACTS
3	WILLOW WOOD SITE PLAN (ELEVATED TANK)
4	WILLOW WOOD EROSION CONTROL PLAN (ELEVATED TANK)
5	OZONE PINES SITE PLAN (ELEVATED TANK)
6	OZONE PINES EROSION CONTROL PLAN (ELEVATED TANK)
7	OZONE PINES GRADING PLAN (ELEVATED TANK)
8-9	OZONE PINES CROSS SECTIONS
10-11	SITE DETAILS
12	ELEVATED TANK
13-14	TANK DETAILS
15	FOUNDATION PLAN
16-18	PROCESS SCHEMATIC & SCHEDULES
E1	ELECTRICAL RISER DIAGRAM (OZONE PINES)
E2	ELECTRICAL SITE PLAN (OZONE PINES)
E3	ENLARGED ELECTRICAL PLAN (OZONE PINES)
E4	ELECTRICAL RISER DIAGRAM (WILLOW WOOD)
E5	ELECTRICAL SITE PLAN (WILLOW WOOD)
E6	ENLARGED ELECTRICAL PLAN (WILLOW WOOD)

STANDARD PLANS	NO. OF SHEET(S)	REVISION DATE
EC-01	2 SHEETS	10.01.08
CB-01	1 SHEET	11.02.00

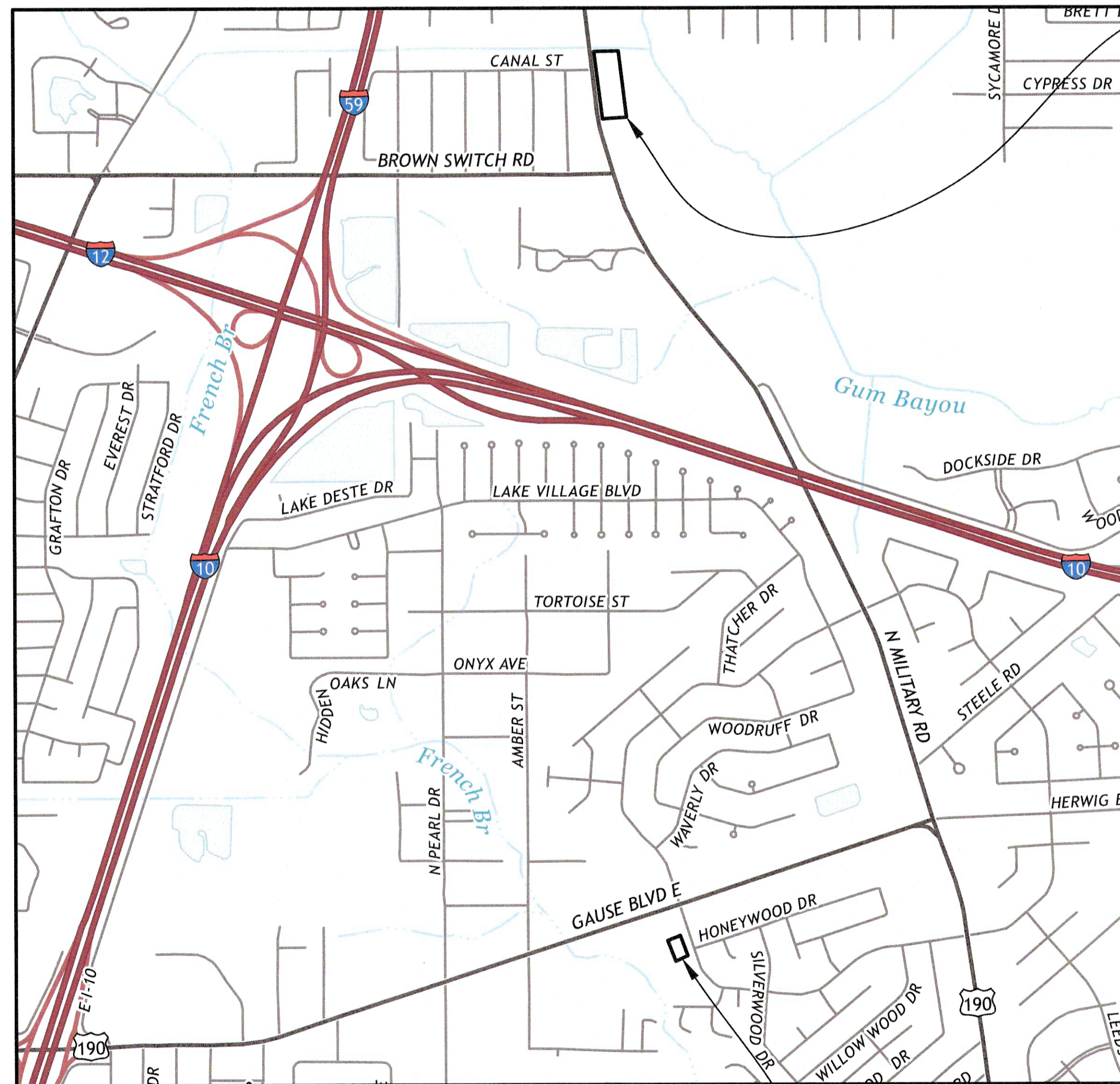
# ST TAMMANY PARISH GOVERNMENT DEPARTMENT OF UTILITIES CROSS GATES WATER SYSTEM NEW ELEVATED STORAGE TANKS

CROSS GATES WATER TOWER #1; TU22000204

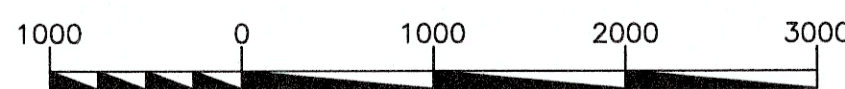
CROSS GATES WATER TOWER #2; TU22000209

AUGUST 2023

BID NO. 23-3-2



LOCATION MAP  
SCALE: 1 INCH = 1000 FEET



PROJECT LOCATION  
(OZONE PINES 400K TANK)

PLANS PREPARED BY AND  
RECOMMENDED FOR APPROVAL:

*Andre C. Monnot*

PRINCIPAL ENGINEERING, INC.  
FIRM LICENSE NO. 3168  
ANDRE C. MONNOT, P.E.  
VICE PRESIDENT



8/11/23  
DATE

ACCEPTED FOR CONSTRUCTION BY:

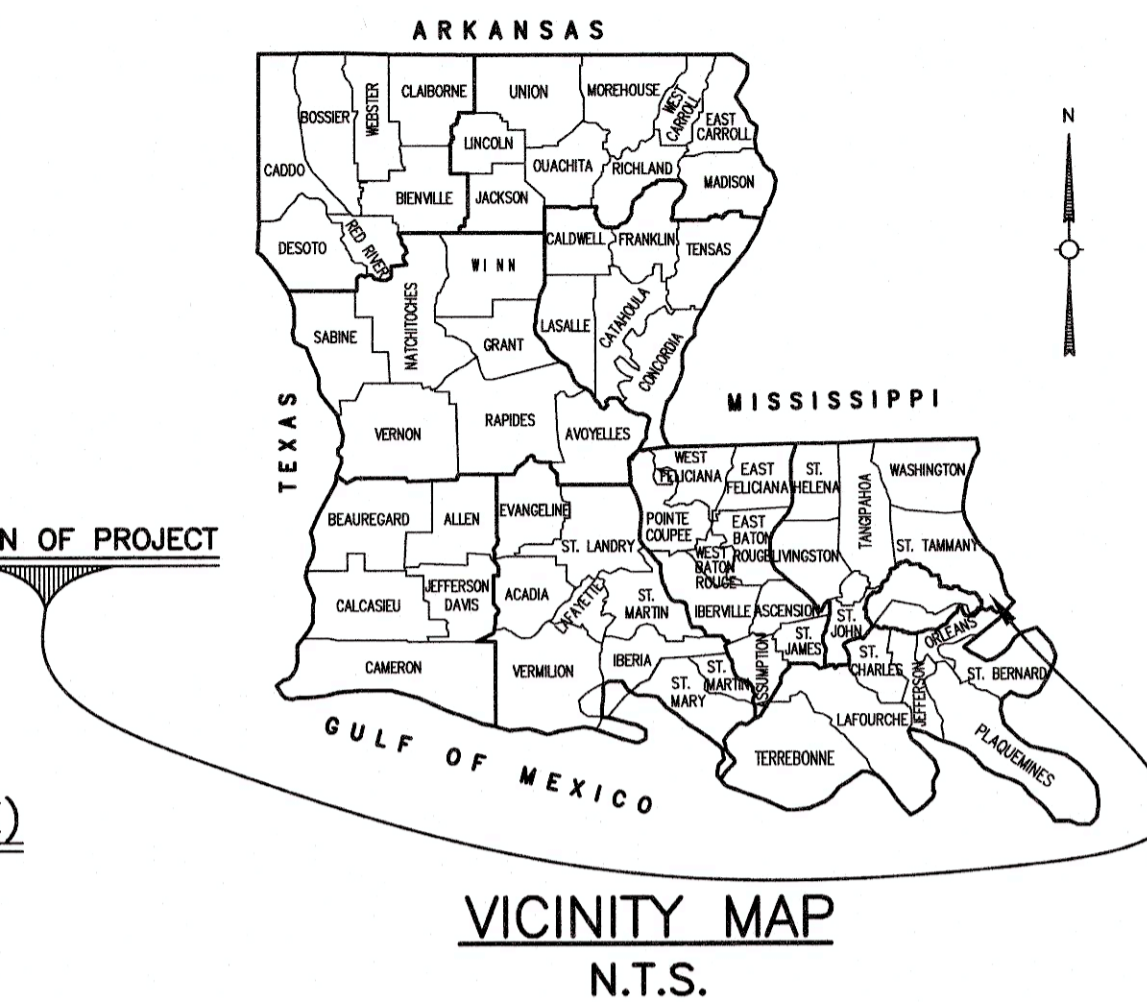
*Christopher P. Tissue*  
DEPARTMENT OF UTILITIES  
CHRISTOPHER P. TISSUE, P.E.  
DIRECTOR

8/11/23  
DATE

PARISH PRESIDENT  
HON. MIKE COOPER

COUNCIL MEMBERS

- |                      |                             |
|----------------------|-----------------------------|
| MARTY DEAN           | DISTRICT I                  |
| DAVID FITZGERALD     | DISTRICT II                 |
| MARTHA CAZAUBON      | DISTRICT III                |
| MICHAEL LORINO JR    | DISTRICT IV                 |
| RYKERT TOLEDANO JR   | DISTRICT V                  |
| CHERYL TANNER        | DISTRICT VI - VICE CHAIRMAN |
| JAMES J. DAVIS       | DISTRICT VII                |
| CHRIS CANULETTE      | DISTRICT VIII               |
| MIKE SMITH           | DISTRICT IX                 |
| MAUREEN "MO" O'BRIEN | DISTRICT X                  |
| ARTHUR LAUGHLIN      | DISTRICT XI                 |
| JERRY BINDER         | DISTRICT XII                |
| JAKE AIREY           | DISTRICT XIII - CHAIRMAN    |
| RONALD RANDOLPH      | DISTRICT XIV                |



VICINITY MAP  
N.T.S.



DEPT. OF UTILITIES  
ST. TAMMANY PARISH  
GOVERNMENT  
620 N. TYLER STREET  
COVINGTON, LA 70433

No.	DATE	DESCRIPTION OF REVISION

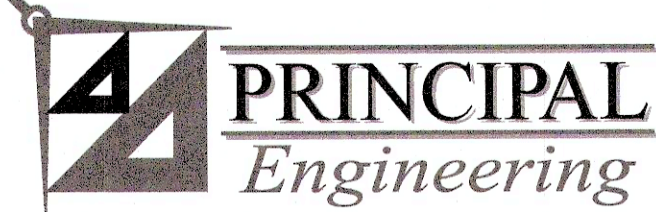
DESIGNED BY: ACM	
DRAWN BY: LMR	
CHECKED BY: TMS	
SUBMITTED BY: PRINCIPAL ENG	
PROJECT No.: TU22000204	
TU22000209	
ISSUE DATE: AUG 2023	
APPROVED BY: ---	
SHEET SIZE: ANSI D	
SCALE: ---	

CROSS GATES WATER SYSTEM  
NEW ELEVATED STORAGE TANK  
SLIDELL, LOUISIANA  
PROJECT No.: TU22000204  
TU22000209

TITLE SHEET

CROSS GATES WATER SYSTEM  
NEW ELEVATED STORAGE TANK  
SLIDELL, LOUISIANA  
PROJECT No.: TU22000204  
TU22000209

SHEET NO.  
1  
SHEET 1 OF 24



THE 2016 EDITION OF THE LOUISIANA DOTD STANDARD SPECIFICATION FOR ROADS AND BRIDGES, AS AMENDED BY THE PROJECT SPECIFICATIONS, SHALL GOVERN THIS PROJECT.

**GENERAL NOTES:**

- ALL ELEVATIONS SHOWN ON THE PLANS ARE NAVD(88).
- THE CONTRACTOR SHALL NOTIFY ALL RESIDENTS WHO MAY BE AFFECTED BY CONSTRUCTION ACTIVITIES AT THE COMMENCEMENT OF THE PROJECT. RESIDENTS MUST BE RE-NOTIFIED THREE DAYS PRIOR TO BEING INDIVIDUALLY IMPACTED BY THE PROJECT. NOTICE SHALL BE BY DOOR HANGER AND COORDINATED WITH THE OWNER. HANGERS WILL BE PROVIDED BY OWNER.
- NOISE CONTROL – CONTRACTOR SHALL TAKE REASONABLE MEASURES TO PREVENT UNNECESSARY NOISE APPROPRIATE FOR THE AMBIENT SOUND LEVELS IN THE AREA DURING WORKING HOURS. ALL CONSTRUCTION MACHINERY & VEHICLES SHALL BE EQUIPPED WITH PRACTICAL SOUND MUFFLING DEVICES, AND OPERATED IN A MANNER TO CAUSE THE LEAST NOISE.
- DUST CONTROL – CONTRACTOR SHALL TAKE REASONABLE MEASURES TO PREVENT UNNECESSARY DUST. EACH SURFACE SUBJECT TO DUSTING SHALL BE KEPT MOIST WITH WATER OR BY APPLICATION OF CHEMICAL DUST SUPPRESSANT AS OFTEN AS REQUIRED TO MINIMIZE DUST. DUSTY MATERIALS IN PILES OR IN TRANSIT SHALL BE COVERED TO PREVENT DUST.
- VIBRATION CONTROL – VIBRATIONS RESULTING FROM PILE DRIVING, CONSTRUCTION EQUIPMENT AND VEHICULAR TRAFFIC MAY AFFECT AND DAMAGE EXISTING STRUCTURES AND UTILITIES. VIBRATIONS SHALL BE MONITORED BY AN INDEPENDENT TESTING LAB AND LIMITED TO 0.25 INCH PER SECOND AT ALL STRUCTURES INCLUDING BUILDINGS AND POOLS. IF AT ANY TIME ANY MONITOR DIRECTION RECORDS A READING OF 0.20 INCHES PER SECOND, THE LABORATORY TECHNICIAN SHALL NOTIFY THE CONTRACTOR AND THE OWNER'S FIELD REPRESENTATIVE IMMEDIATELY. THE CONTRACTOR SHALL RECORD THE ACTIVITY AND LOCATION CAUSING THE READING.  
  
IF AT ANY TIME ANY MONITOR IN ANY DIRECTION RECORDS A READING OF 0.25 INCHES PER SECOND OR GREATER, THE LABORATORY TECHNICIAN SHALL NOTIFY THE CONTRACTOR AND THE OWNER'S FIELD REPRESENTATIVE IMMEDIATELY AND THE AFFECTING CONSTRUCTION ACTIVITY SHALL BE SUSPENDED. THE CONTRACTOR SHALL PROPOSE TO THE ENGINEER CORRECTIVE MEASURES FOR THE AFFECTING CONSTRUCTION ACTIVITY TO ENSURE THAT VIBRATION-MONITORING LIMITS WILL NOT BE EXCEEDED. UPON APPROVAL BY THE ENGINEER, THE MODIFIED CONSTRUCTION ACTIVITY MAY RESUME. REPAIR OF ANY DAMAGE CAUSED BY THE VIBRATIONS ABOVE SAFE LIMITS AS SPECIFIED HEREIN SHALL BE THE FULL RESPONSIBILITY OF THE CONTRACTOR.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYING OUT THE WORK AND VERIFYING ALL MEASUREMENTS AND GRADES PRIOR TO BEGINNING OF CONSTRUCTION. PROJECT VERTICAL AND HORIZONTAL CONTROLS HAVE BEEN INDICATED ON THE PLANS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH BASE LINE AND ADDITIONAL T.B.M.'S BEFORE DESTROYING REFERENCED MONUMENTS/NAILS/CROSS CUTS, ETC.
- ANY DISCREPANCIES DISCOVERED ON THE PLANS OR DRAWINGS, OR BETWEEN THE PLANS AND SPECIFICATIONS, SHALL BE REPORTED TO THE ENGINEER BEFORE ANY WORK BEGINS. FAILURE TO DO SO MAY RESULT IN THE REMOVAL OF RECENT WORK AT NO ADDITIONAL COST TO THE OWNER AND SUCH ERRORS SHALL NOT BE AUTOMATIC GROUNDS FOR CONTRACT MODIFICATION. UPON THE DISCOVERY OF DISCREPANCIES BETWEEN REQUIREMENTS WITHIN THE PROJECT PLANS AND SPECIFICATIONS, THE ENGINEER RESERVES THE RIGHT TO ENFORCE UP TO THE MOST STRINGENT REQUIREMENTS AS HE DEEMS NECESSARY FOR THE SUCCESS OF THE PROJECT.
- THE CONTRACTOR MUST VERIFY ELEVATION OF ALL EXISTING INVERTS THAT ARE A PART OF THIS PROJECT.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL OSHA STANDARDS FOR EXCAVATION AND TRENCHING SAFETY ARE IMPLEMENTED AT ALL TIMES DURING ANY AND ALL EXCAVATION AND TRENCHING OPERATIONS.
- LOCATION OF EXISTING UTILITIES SHOWN ON PLANS ARE APPROXIMATE ONLY. ADDITIONALLY, THERE MAY BE UTILITIES PRESENT NOT SHOWN ON THESE PLANS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE HORIZONTAL AND VERTICAL LOCATION AND DEPTH OF ALL EXISTING UTILITIES THAT WILL AFFECT THE PROPOSED WORK BEFORE CONSTRUCTION. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES.

- THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SHEETING, BRACING AND DEWATERING NECESSARY FOR THE INSTALLATION OF NEW DRAINAGE PIPE, UTILITIES, OR STRUCTURES FOR THE STABILITY SURROUNDING STRUCTURES AND THE EXCAVATION ITSELF (NO DIRECT PAY). EXCAVATION, BEDDING, PLANKING, AND BACKFILL FOR ALL DRAINAGE PIPES, UTILITIES, AND STRUCTURES SHALL BE AT NO COST TO THE OWNER.
- THE CONTRACTOR SHALL REPAIR OR REPLACE FENCES, YARD SURFACES, OR OTHER SURFACES AND/OR STRUCTURES WHICH ARE DAMAGED, REMOVED, OR OTHERWISE DISTURBED DURING CONSTRUCTION. REPAIRS SHALL BE TO ORIGINAL CONDITION OR BETTER AND SHALL BE TO THE COMPLETE SATISFACTION OF THE OWNER AND ENGINEER. SUCH REPAIRS AND/OR REPLACEMENTS NOT PAID FOR IN A SPECIFIC LINE ITEM SHALL BE AN ABSORBED COST ITEM.
- ANY SIGNS, CULVERTS, MAIL BOXES, ETC. DISTURBED BY CONSTRUCTION SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AT NO EXPENSE TO THE OWNER.
- THE CONTRACTOR SHALL PROTECT TREES, SHRUBBERY, SOD AND OTHER VEGETATION, NOT SPECIFIED FOR REMOVAL BY DRAWINGS OR SPECIFICATIONS, AND SHALL REPAIR OR REPLACE SUCH ITEMS AS ARE DAMAGED DURING CONSTRUCTION OF THE PROJECT WITH THE SAME TYPES AND QUALITY AS THOSE THAT ARE DAMAGED. SUCH REPAIR OR REPLACEMENT SHALL BE TO THE SATISFACTION OF THE ENGINEER AND THE OWNER OF THE PROPERTY INVOLVED, AND SHALL BE AT NO COST TO THE OWNER.
- THE CONTRACTOR SHALL CONTACT ALL PUBLIC AND PRIVATE UTILITIES AND LOUISIANA ONE CALL AT LEAST FOUR (4) WORKING DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION AROUND THEIR RESPECTIVE UTILITIES. UNDERGROUND UTILITIES ARE EXISTING AND WILL REMAIN IN THE CONSTRUCTION AREA. THE EXISTING UTILITY LOCATIONS ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY. BEFORE ANY EXCAVATION, THE CONTRACTOR SHALL CALL LOUISIANA ONE CALL FOR FURTHER LOCATION OF UTILITIES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE INTEGRITY OF THE SLOPES AND ADJOINING AREAS THAT ARE OUTSIDE THE LIMITS OF CONSTRUCTION.
- MATERIAL NOT DESIRED TO BE RETAINED BY ST. TAMMANY PARISH SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OFF SITE IN A LEGAL AND LAWFUL MANNER.
- CONTRACTOR SHALL MAINTAIN NORMAL HOURS OF OPERATION DUE TO PROXIMITY OF RESIDENCES. NORMAL HOURS OF OPERATION ARE FROM 7:00 AM TO 6:00 PM MONDAY THROUGH FRIDAY. SEE SECTION 01010 OF THE PROJECT SPECIFICATIONS.
- ALL TREE REMOVALS, BRANCH PRUNING, OR ROOT CUTTING, SHALL BE PERFORMED BY A CONTRACTOR PROVIDED LICENSED ARBORIST, TO BE APPROVED BY THE DEPARTMENT OF PUBLIC WORKS OF ST. TAMMANY PARISH.
- THE CONTRACTOR SHALL PROTECT THE EXISTING UTILITIES BY PROVIDING ADEQUATE SUPPORT AND BRACING DURING INSTALLATION OF NEW UTILITIES UNDER THOSE EXISTING LINES. CONTRACTOR WILL BE RESPONSIBLE FOR REPAIRING OR REPLACING THE EXISTING LINES IF DAMAGED AT NO COST TO THE OWNER.
- THE CONTRACTOR SHALL NOT RESTRICT DRAINAGE FLOW DURING RAIN EVENTS. CONTRACTOR TO ENSURE THAT CONSTRUCTION OPERATIONS OR THE TEMPORARY EROSION CONTROL AT THE OUTFALL STRUCTURES DOES NOT CAUSE A RESTRICTION IN FLOW WHICH COULD RESULT IN FLOODING.
- INSTALLATION, MEASUREMENT, AND PAYMENT FOR ALL QUANTITIES SHALL BE IN ACCORDANCE WITH CONTRACT SPECIFICATIONS.
- THE CONTRACTOR WILL BE RESPONSIBLE FOR REGULAR CLEANUP OF THE CONSTRUCTION AREA AND PROPER DISPOSAL OF ANY DEBRIS/MATERIAL REMOVED FROM THE SITE AT A MINIMUM, CLEAN UP WILL BE PERFORMED DAILY.
- ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION BY THE CONTRACTOR.
- BASIS OF BID: FOR THE PRICES BID, CONTRACTOR SHALL PROVIDE A COMPLETE AND USEABLE FACILITY IN THE INTENT OF CONTRACT DOCUMENTS, FURNISH, INSTALL, AND MAKE OPERATIONAL ALL EQUIPMENT, ACCESSORIES, COMPONENTS, AND SPECIALS REASONABLY INFERRABLE, WHETHER EXPLICITLY SHOWN ON THE DOCUMENTS OR NOT.

- THE CONTRACTOR SHALL PROVIDE FOR AND MAINTAIN BOTH THROUGH AND LOCAL TRAFFIC AT ALL TIMES AND CONDUCT THEIR OPERATIONS IN SUCH A MANNER TO CAUSE THE LEAST POSSIBLE DISRUPTION TO THE AREA RESIDENTS. THE CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL AND WARNING DEVICES IN ACCORDANCE WITH THE LATEST REVISIONS OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AS ADOPTED BY LADOTD.
- ANY TEMPORARY TRAFFIC CONTROL DEVICES NOT APPLYING TO AN APPROPRIATE SITUATION, OR WHICH ARE NO LONGER REQUIRED, SHALL BE COVERED OR REMOVED BY THE CONTRACTOR.
- CONTRACTOR SHALL SOD ALL DISTURBED, UNPAVED AREAS IN ACCORDANCE WITH SECTION 02920 OF THE SPECIFICATIONS.

**COORDINATION OF WORK:**

- CONTRACTOR SHALL COORDINATE AND COOPERATE WITH OTHER CONTRACTORS EMPLOYED BY THE OWNER. CONSTRUCTION OF ELEVATED WATER STORAGE TANKS AND CONSTRUCTION OF WELL, CONTROLS, AND BUILDING BY TWO SEPARATE CONTRACTS COMBINE TO COMPLETE TWO INTEGRATED, FUNCTIONING WATER PRODUCTION SITES. CONSTRUCTION OF OZONE PINES WATER DISTRIBUTION SYSTEM IS BY THIRD CONTRACTOR.
- ORDER OF OPERATIONS (CONTRACT CALENDAR DAYS FROM NTP)
  - DAY 0 – SIMULTANEOUS CONTRACT NOTICES TO PROCEED

WILLOW WOOD:  
TANK CONTRACTOR FIRST CONSTRUCTS WILLOW WOOD TANK AND TIE-IN PIPING. ELEVATED TANK IS DISINFECTED, CONNECTED TO SYSTEM, AND ENTERS SERVICE. SUBSTANTIAL COMPLETION DUE BY DAY 441.

WELL CONTRACTOR BEGINS WORK UPON COMPLETION OF WILLOW WOOD TANK. WELL AND HYDROPNEUMATIC TANK ARE REMOVED FROM SERVICE. ELEVATED TANK REMAINS IN SERVICE, CONNECTED TO DISTRIBUTION SYSTEM. AT CONCLUSION OF WELL CONTRACTOR WORK, WELL DISCHARGE TO ELEVATED TANK IS ESTABLISHED. WILLOW WOOD SUBSTANTIAL COMPLETION DUE BY DAY 714.

STARTUP AND COMMISSIONING AT WILLOW WOOD SHALL BE CONDUCTED WITH JOINT PARTICIPATION BY TANK AND WELL CONTRACTOR.

OZONE PINES:  
TANK CONTRACTOR SEQUENCES FOUNDATION CONSTRUCTION, STEEL ERECTION, ETC. FROM WILLOW WOOD TO OZONE PINES. TANK CONTRACT SUBSTANTIAL COMPLETION DUE BY DAY 553. TANK MAY REMAIN OUT OF SERVICE AT INITIAL COMPLETION, UNTIL DISTRIBUTION PIPING COMPLETION BY DISTRIBUTION CONTRACTOR.

WELL CONTRACTOR COMPLETES NEW WELL CONSTRUCTION, THEN COMPLETES REMAINING WORK. WELL CONTRACT SUBSTANTIAL COMPLETION IS DUE BY DAY 714.

TANK AND WELL CONTRACTORS SHALL OPERATE SIMULTANEOUSLY AT OZONE PINES SITE WITHIN LIMITS SHOWN ON THE DRAWINGS.

STARTUP AND COMMISSIONING AT OZONE PINES SHALL BE CONDUCTED WITH JOINT PARTICIPATION BY TANK AND WELL CONTRACTOR.

**CODE COMPLIANCE:**

- THIS IS A DRINKING WATER PROJECT. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LOUISIANA SANITARY CODE PROVISIONS (LAC TITLE 51, PART XII), REQUIREMENTS INCORPORATED BY REFERENCE THEREIN, AND THE PROJECT DOCUMENTS.
- ALL EQUIPMENT, COATINGS, LININGS, OR MATERIAL IN CONTACT WITH DRINKING WATER SHALL BE NSF 61 APPROVED.
- CONTRACTOR SHALL COMPLY WITH ALL ST. TAMMANY PARISH CODES AND ORDINANCES.
- AWWA STANDARDS:
  - ALL WORK SHALL CONFORM TO APPLICABLE AWWA STANDARDS.

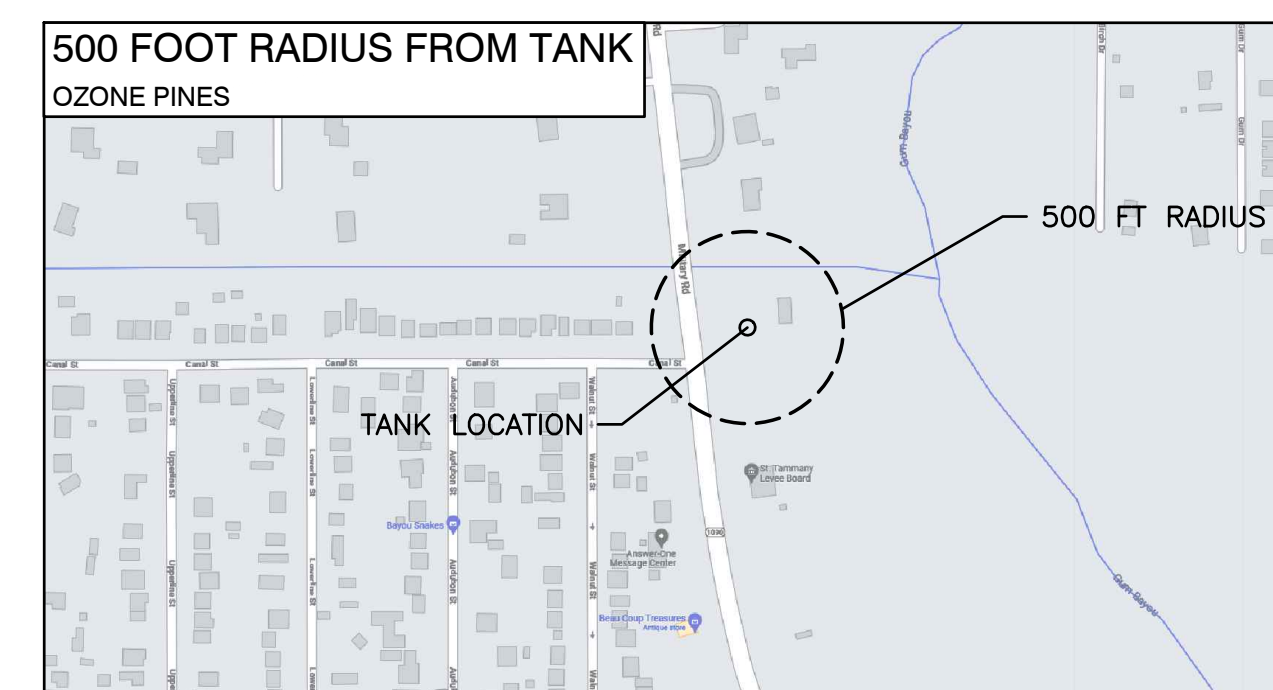
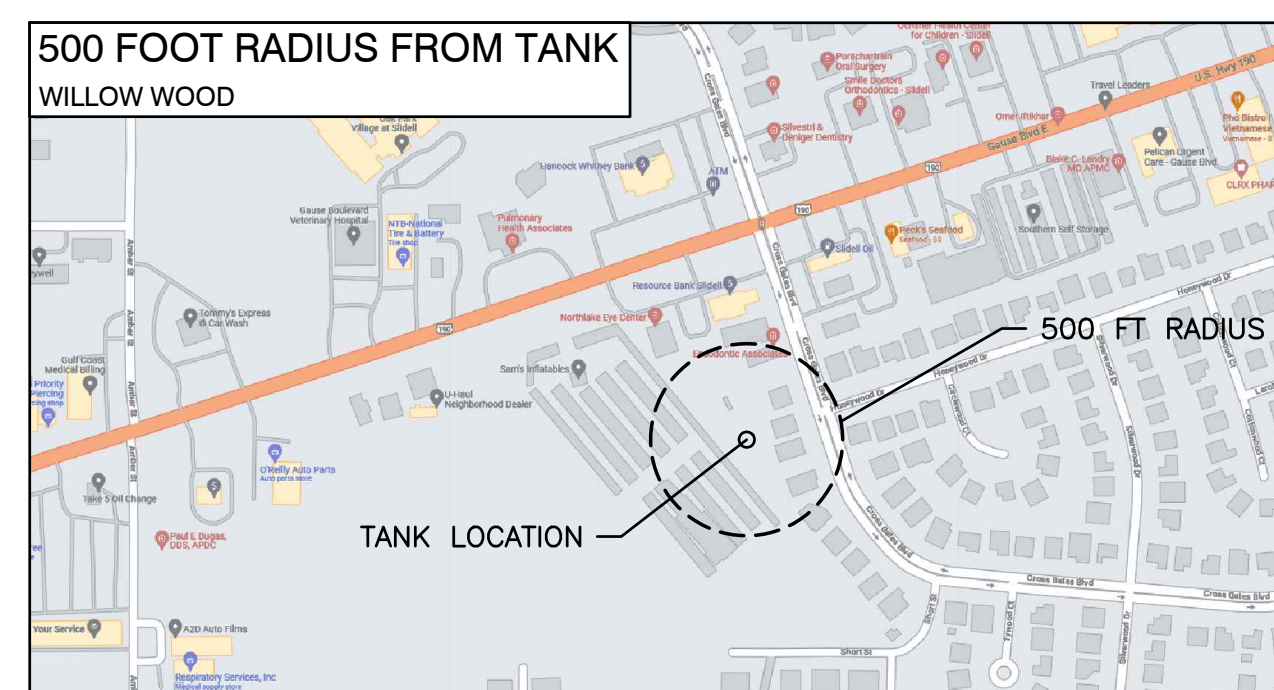
**LEGEND:**

- CATCH BASIN
- POWER POLE
- COLUMN/POST
- TREE
- IRON ROD SET
- UTILITY BOX
- FIRE HYDRANT
- WATER SYMBOL
- DRAIN LINE
- FENCE LINE
- OVERHEAD ELECTRIC
- SEWER LINE
- WATER LINE
- SERVITUDE
- RIGHT OF WAY/PROPERTY LINE
- EXIST. GRADE
- REQ'D GRADE
- SURFACE FLOW
- SWALE
- SEWER CLEANOUT
- TELEPHONE RISER

**ABBREVIATIONS**

- RCP REINFORCED CONCRETE PIPE
- CMP CORRUGATED METAL PIPE
- INV INVERT
- HDPE HIGH DENSITY POLYETHYLENE
- P/L PROPERTY LINE
- PVC POLYVINYL CHLORIDE PIPE
- CMPA CORRUGATED METAL ARCH PIPE
- RCPA REINFORCED CONCRETE ARCH PIPE
- W.L. WATER LINE
- G.V. GATE VALVE
- T.C. TOP OF CASTING
- U.E. UNDERGROUND ELECTRIC
- BFP BACK FLOW PREVENTER
- PCC PORTLAND CEMENT CONCRETE
- D.I. DUCTILE IRON

**MINIMUM COVERAGE AREA FOR SITE CONDITION SURVEY:**

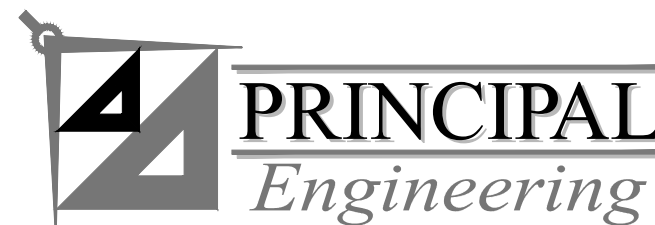


**LADOTD DISTRICT 62 CONTACT LIST**

DEPARTMENT	CONTACT	TELEPHONE
PERMITTING	ERNEST MATHERNE	(985) 375-0130

**UTILITY CONTACT LIST**

UTILITY	OWNER	CONTACT	TELEPHONE
WATER	ST TAMMANY PARISH	FIELD OPERATIONS SUPERVISOR	(985) 893-1717
SEWER	ST TAMMANY PARISH	FIELD OPERATIONS SUPERVISOR	(985) 893-1717
ELECTRIC	CLECO	TAYLOR CREECH	(985) 867-4635
ELECTRIC	WASHINGTON-ST. TAMMANY	HERB GORNOR	(985) 643-6612
GAS	ATMOS	JEFFREY RAIFORD	(985) 729-0993
STREET/DRAINAGE	ST. TAMMANY PARISH DPW		(985) 848-2557
COMMUNICATION	CHARTER	KEVIN DAVID	(985) 285-4702
COMMUNICATION	AT&T	STEVE BERGERON	(985) 327-6432



DEPT. OF UTILITIES  
ST. TAMMANY PARISH  
GOVERNMENT  
620 N. TYLER STREET  
COVINGTON, LA 70433

DATE:	DESCRIPTION OF REVISION	No.

DESIGNED BY: ACM	PROJECT No.: TU22000204
DRAWN BY: LMR	ISSUE DATE: AUG 2023
CHECKED BY: TMS	APPROVED BY: ---
SUBMITTED BY: PRINCIPAL ENG	SHEET SIZE: ANSI D
SCALE:	



CROSS GATES WATER SYSTEM  
NEW ELEVATED STORAGE TANK  
SLIDELL, LOUISIANA  
PROJECT No.: TU22000204  
TU22000209  
GENERAL NOTES & LEGEND



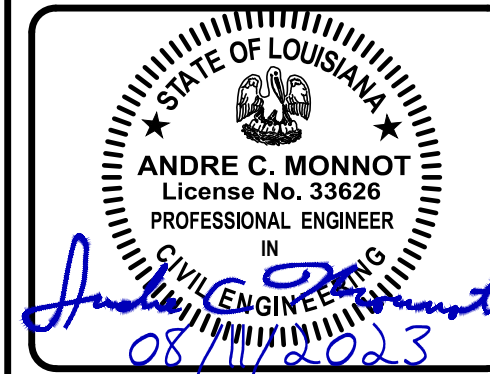




DEPT. OF UTILITIES  
ST. TAMMANY PARISH  
GOVERNMENT  
620 N. TYLER STREET  
COVINGTON, LA 70433

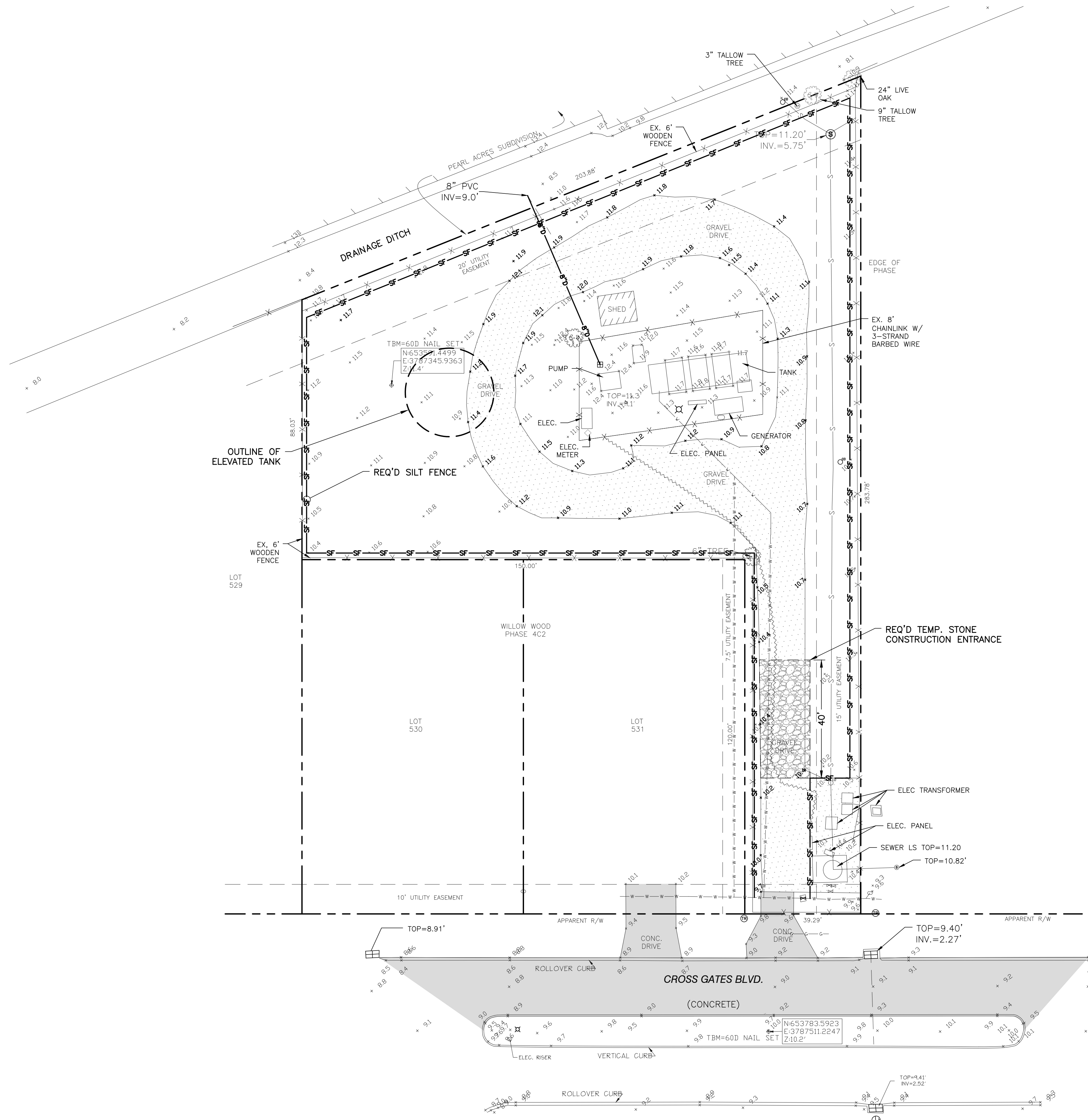
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CHECKED BY: TMS	SUBMITTED BY: PRINCIPAL ENG
PROJECT No.: TU22000204	ISSUE DATE: AUG 2023
APPROVED BY: ---	SHEET SIZE: ANSI D
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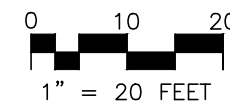
CROSS GATES WATER SYSTEM  
NEW ELEVATED STORAGE TANK  
SLIDELL, LOUISIANA  
PROJECT No.: TU22000204  
TU22000209  
WILLOW WOOD EROSION CONTROL  
PLAN (ELEVATED TANK)

SHEET NO.  
**4**  
SHEET 4 OF 24



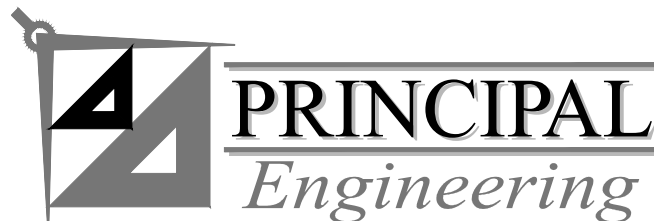
### EROSION CONTROL PLAN

SCALE: 1" = 20'-0"



**NOTES:**

- CONTRACTOR SHALL CONSTRUCT TEMPORARY STONE CONSTRUCTION ENTRANCE WHERE INDICATED ON THIS PLAN AND AS REQUIRED ON EC-01. STONE ENTRANCE AND SILT FENCE SHALL REMAIN AFTER PROJECT COMPLETION.
- REFER TO EC-01 STANDARD PLANS FOR EROSION CONTROL DETAILS.







DEPT. OF UTILITIES  
ST. TAMMANY PARISH  
GOVERNMENT  
620 N. TYLER STREET  
COVINGTON, LA 70433

DATE:	DESCRIPTION OF REVISION

DESIGNED BY: LACM	ANSI D
DRAWN BY: LMR	SCALE:
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PROJECT No.: TU22000204	
ISSUE DATE: AUG 2023	
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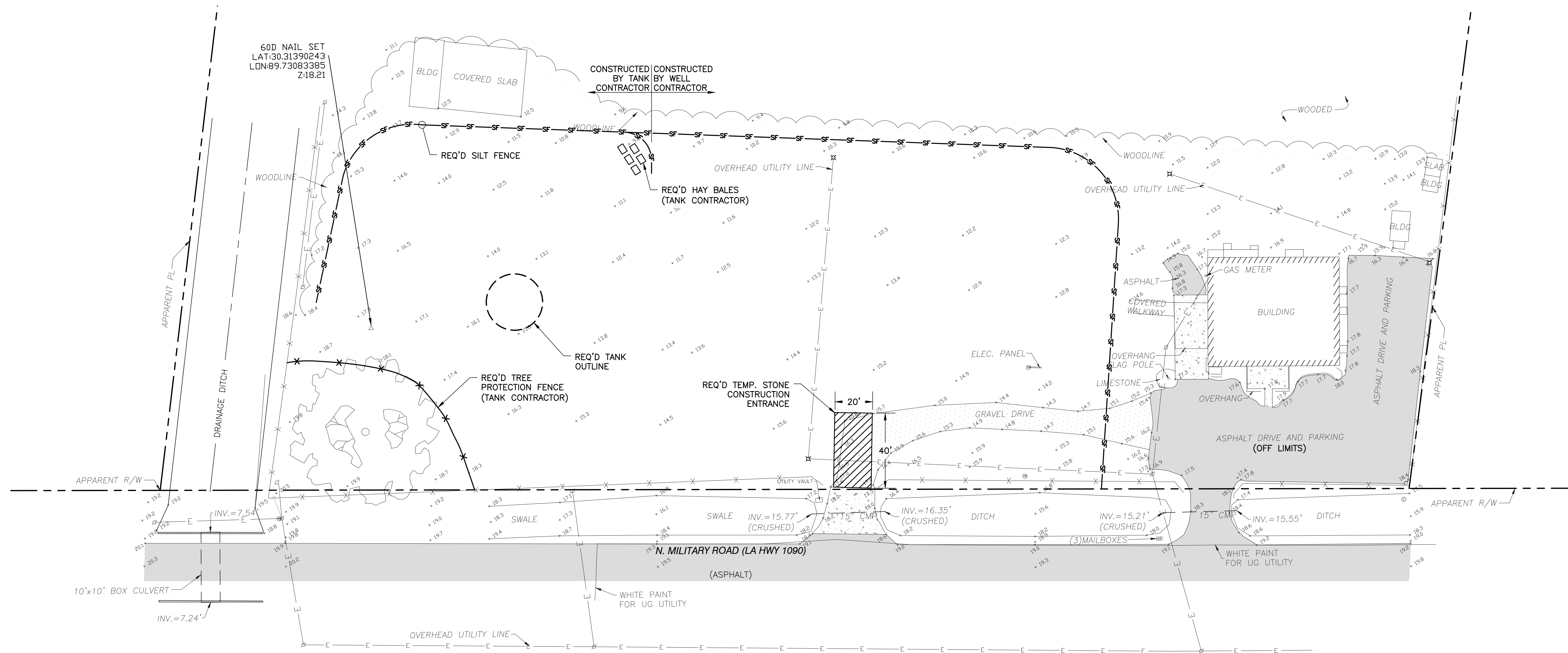
STATE OF LOUISIANA  
ANDRE C. MONNOT  
License No. 33626  
PROFESSIONAL ENGINEER  
IN  
CIVIL ENGINEERING  
*Andre C. Monnot*  
08/11/2023

CROSS GATES WATER SYSTEM  
NEW ELEVATED STORAGE TANK  
SLIDELL, LOUISIANA  
PROJECT No.: TU22000204  
TU22000209  
OZONE PINES EROSION CONTROL  
PLAN (ELEVATED TANK)

SHEET NO.

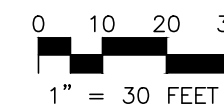
6

SHEET 6 OF 24



### EROSION CONTROL PLAN

SCALE: 1" = 30'-0"



- LEGEND:**
- SILT FENCE
  - HAY BALES
  - CONSTRUCTION ENTRANCE

**NOTES:**

1. TANK CONTRACTOR SHALL CONSTRUCT TEMPORARY STONE CONSTRUCTION ENTRANCE WHERE INDICATED ON THIS PLAN AND AS REQUIRED ON EC-01. STONE ENTRANCE SHALL REMAIN AFTER PROJECT COMPLETION.
2. WELL CONTRACTOR TO MAINTAIN SILT FENCE AND STONE CONSTRUCTION ENTRANCE ESTABLISHED BY TANK CONTRACTOR FOR PROJECT DURATION.
3. WELL CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF STONE CONSTRUCTION ENTRANCE AT PROJECT COMPLETION.
4. REFER TO EC-01 STANDARD PLANS FOR EROSION CONTROL DETAILS.





DEPT. OF UTILITIES  
ST. TAMMANY PARISH  
GOVERNMENT  
620 N. TYLER STREET  
COVINGTON, LA 70433

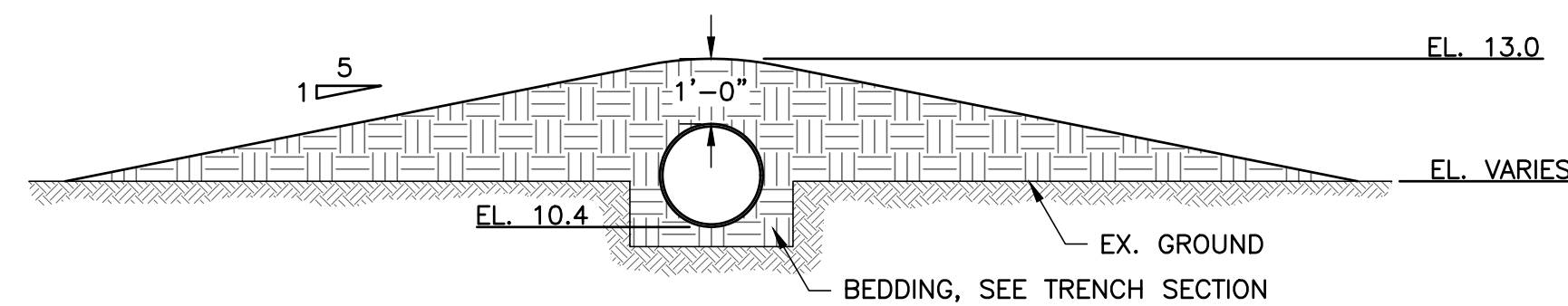
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DRAWN BY: TMS	LMR
CHECKED BY: TMS	TMS
SUBMITTED BY: PRINCIPAL ENG	TMS
PROJECT No.: TU22000204	TU22000204
ISSUE DATE: AUG 2023	TU22000209
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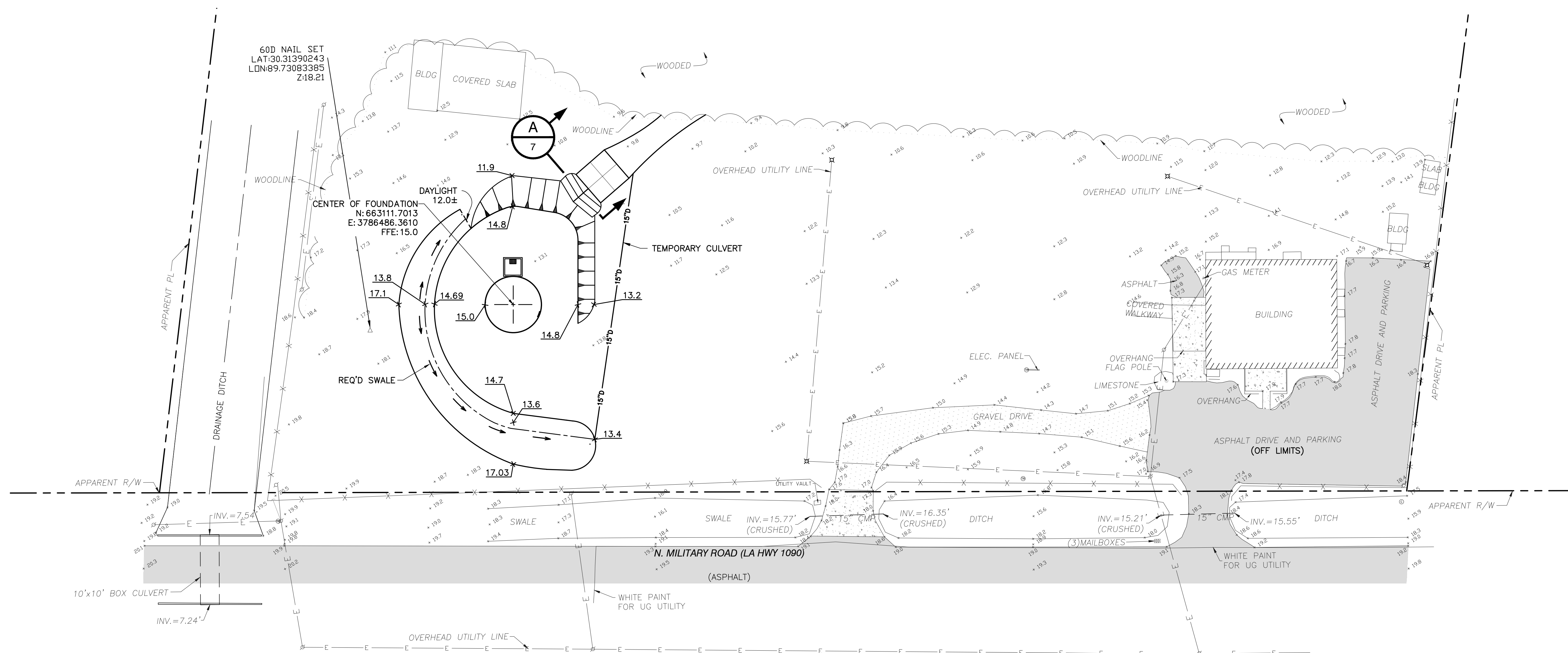


CROSS GATES WATER SYSTEM  
NEW ELEVATED STORAGE TANK  
SLIDELL, LOUISIANA  
PROJECT No.: TU22000204  
TU22000209  
OZONE PINES GRADING PLAN  
(ELEVATED TANK)

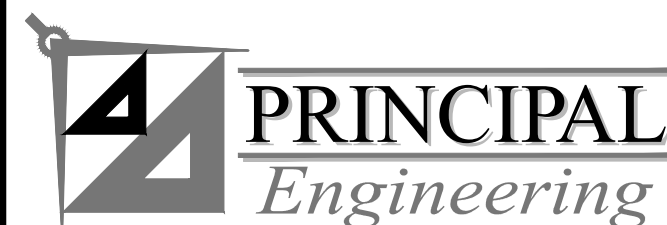
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**7**  
SHEET 7 OF 24

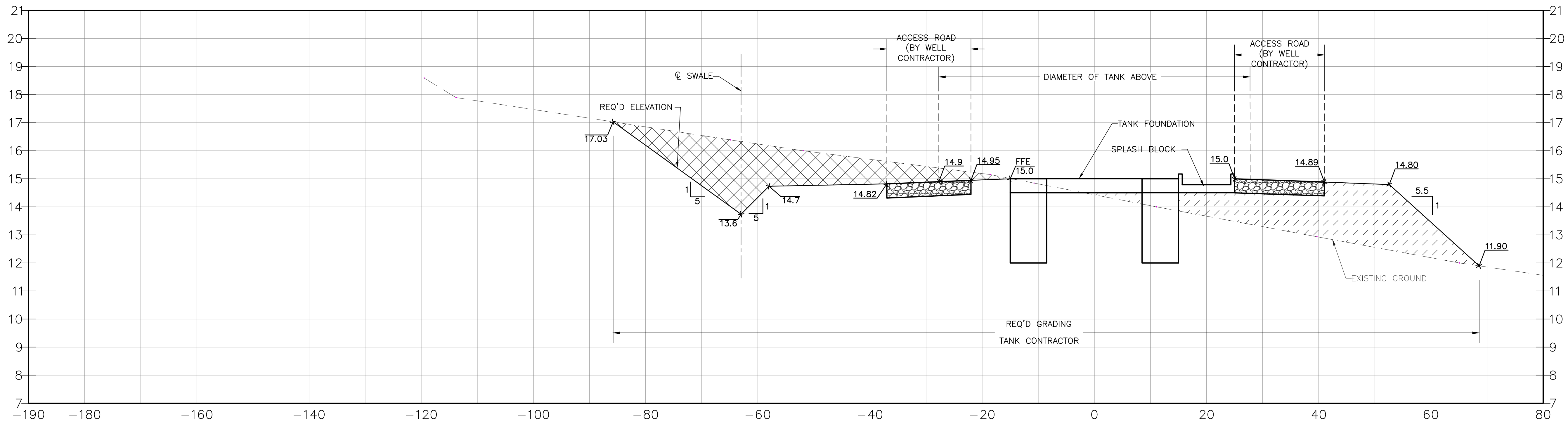


**A**  
**7**  
**BURIED DRAIN SECTION**  
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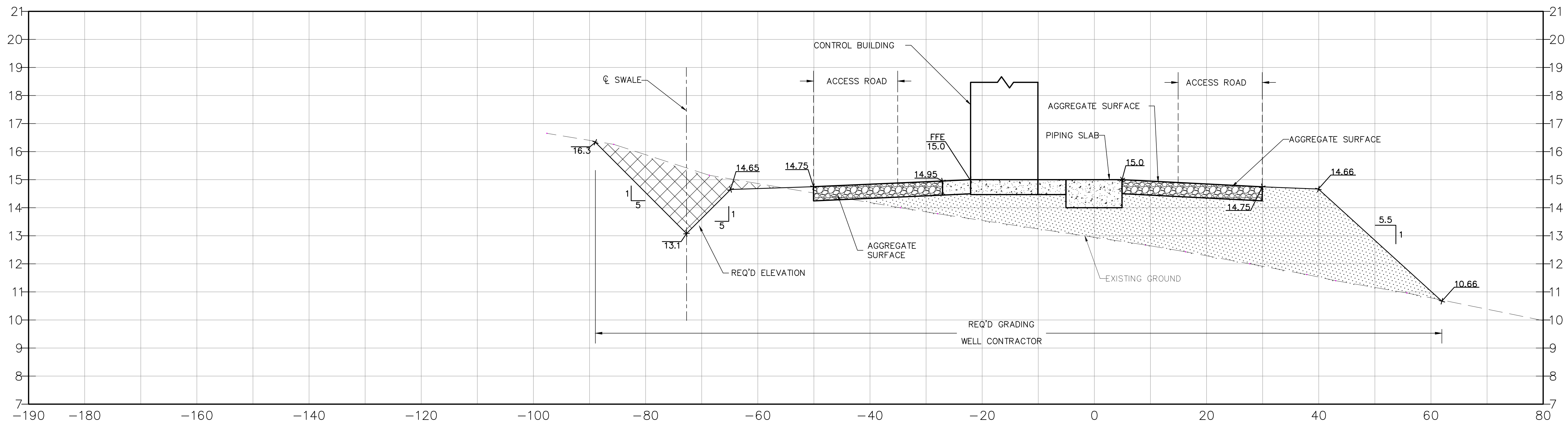


**GRADING PLAN**  
SCALE: 1" = 30'  
0 10 20 30  
1" = 30 FEET





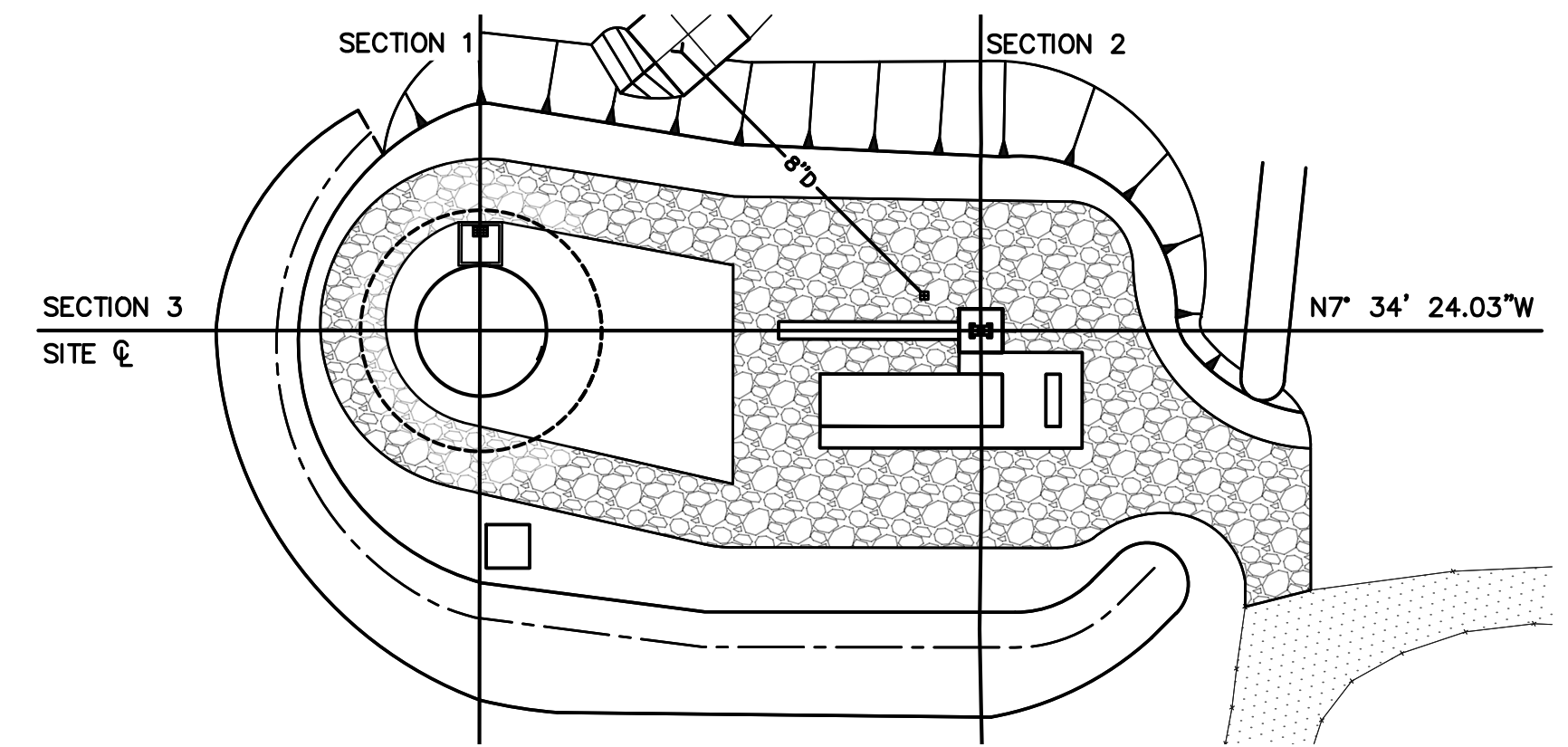
**SECTION 1**



**SECTION 2**

**LEGEND**

	FILL
	EXCAVATION



FT. (NAVD)

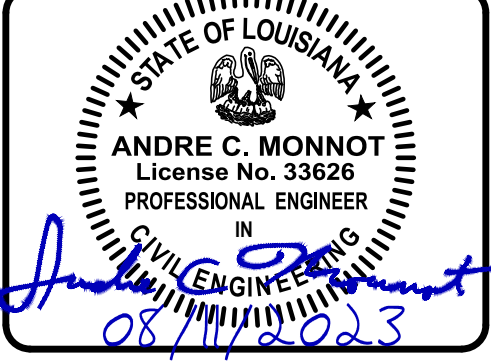
FT. (NAVD)



DEPT. OF UTILITIES  
ST. TAMMANY PARISH  
GOVERNMENT  
620 N. TYLER STREET  
COVINGTON, LA 70433

DATE:	DESCRIPTION OF REVISION	No.

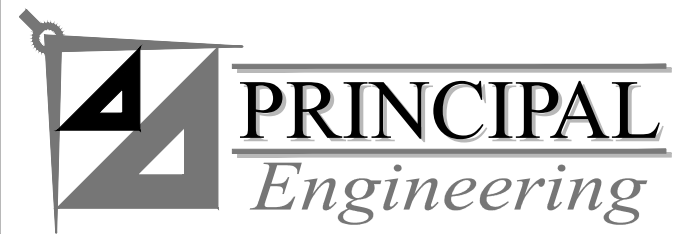
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CROSS GATES WATER SYSTEM  
NEW ELEVATED STORAGE TANK  
SLIDELL, LOUISIANA  
PROJECT No.: TU22000204  
TU22000209

OZONE PINES CROSS SECTIONS

SHEET NO.  
**8**  
SHEET 8 OF 24

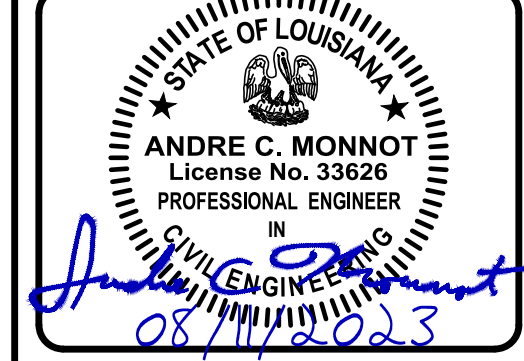




DEPT. OF UTILITIES  
ST. TAMMANY PARISH  
GOVERNMENT  
620 N. TYLER STREET  
COVINGTON, LA 70433

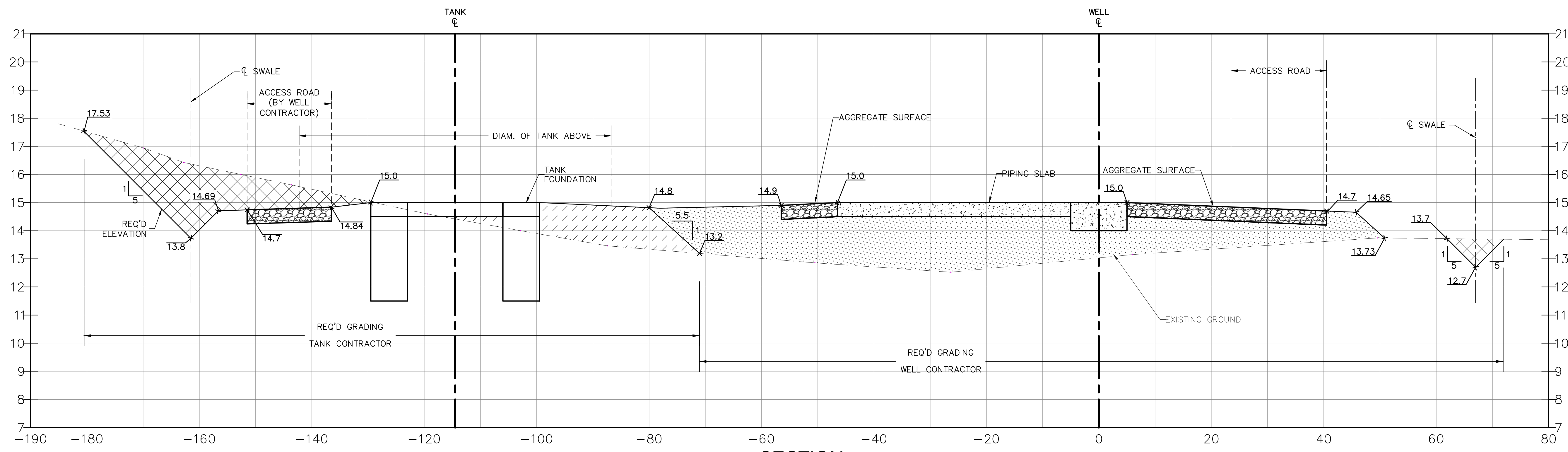
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ISSUE DATE:	AUG 2023
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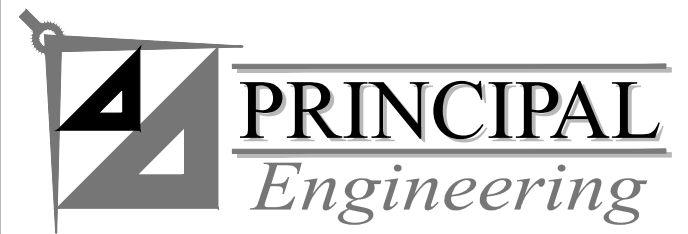
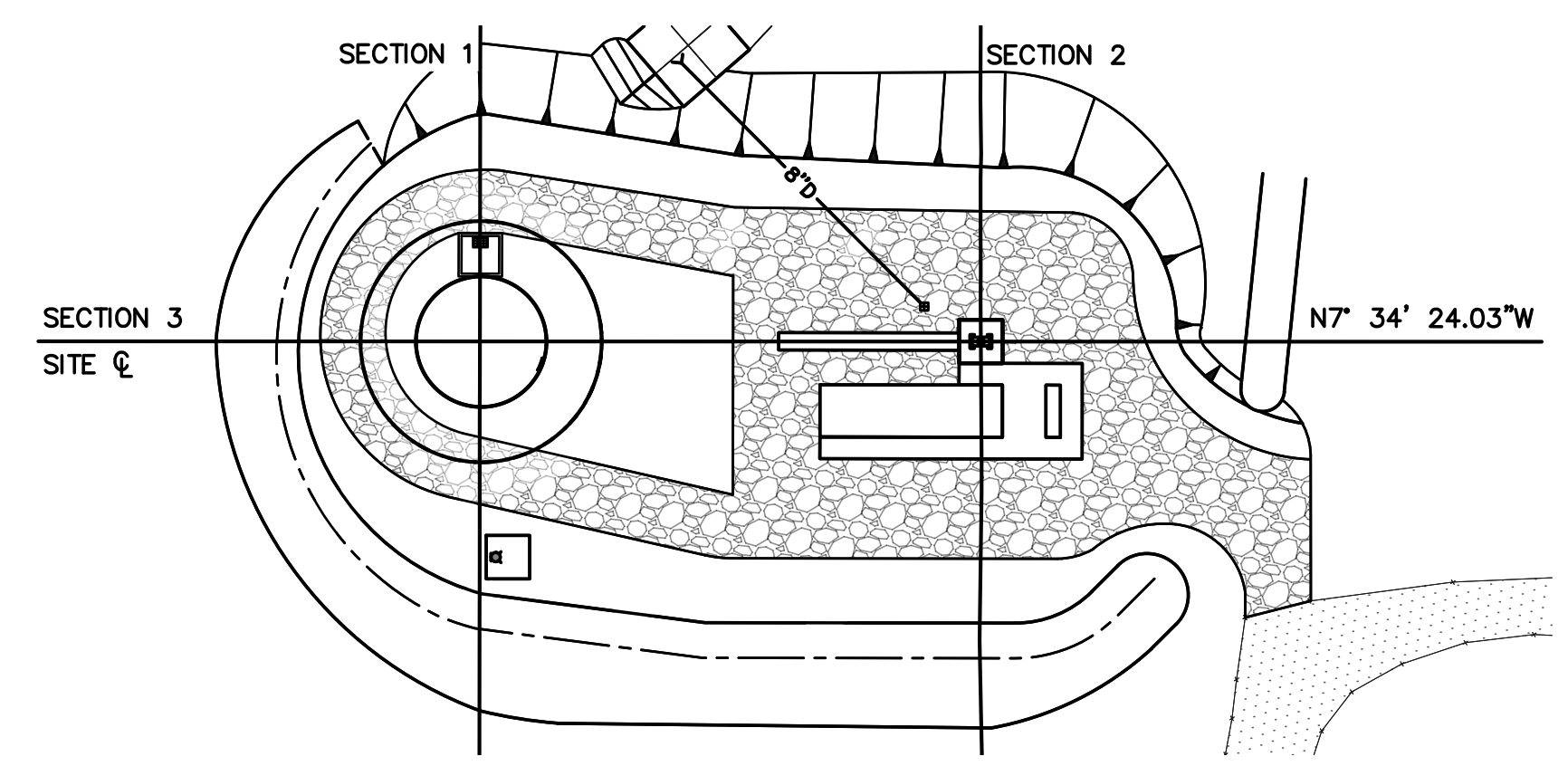
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NEW ELEVATED STORAGE TANK  
SLIDELL, LOUISIANA  
PROJECT No.: TU22000204  
TU22000209  
OZONE PINES CROSS SECTIONS

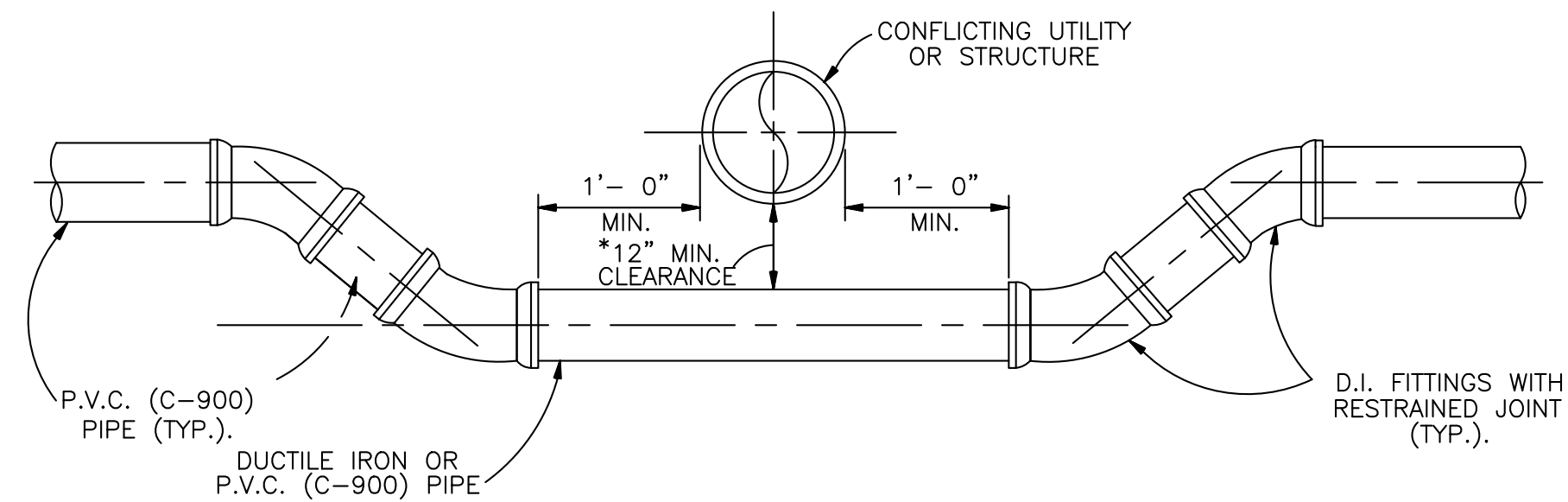
SHEET NO.  
**9**  
SHEET 9 OF 24



**SECTION 3**

- LEGEND**
- FILL (TANK CONTRACTOR)
  - FILL (WELL CONTRACTOR)
  - EXCAVATION

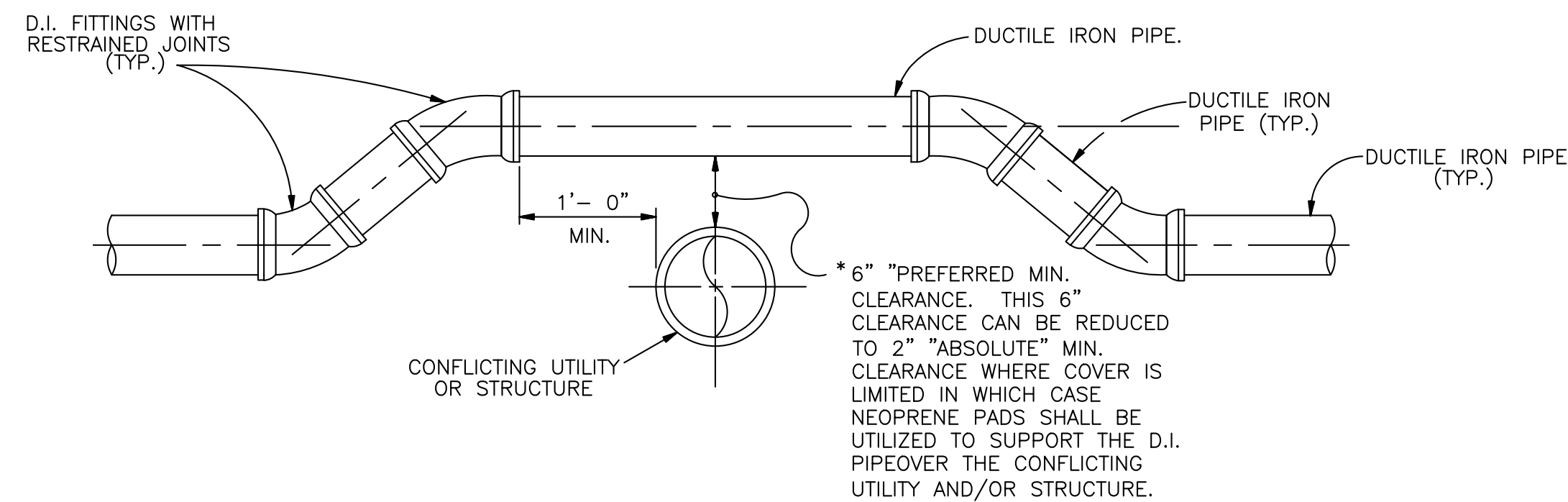




\*EXCEPTION. MINIMUM CLEARANCE SHALL BE 18" BETWEEN POTABLE WATER AND SANITARY SEWER LINES.

**TYPICAL VERTICAL (UNDER) OR HORIZONTAL OFFSET DETAILS FOR WATER AND SEWER FORCE MAINS**

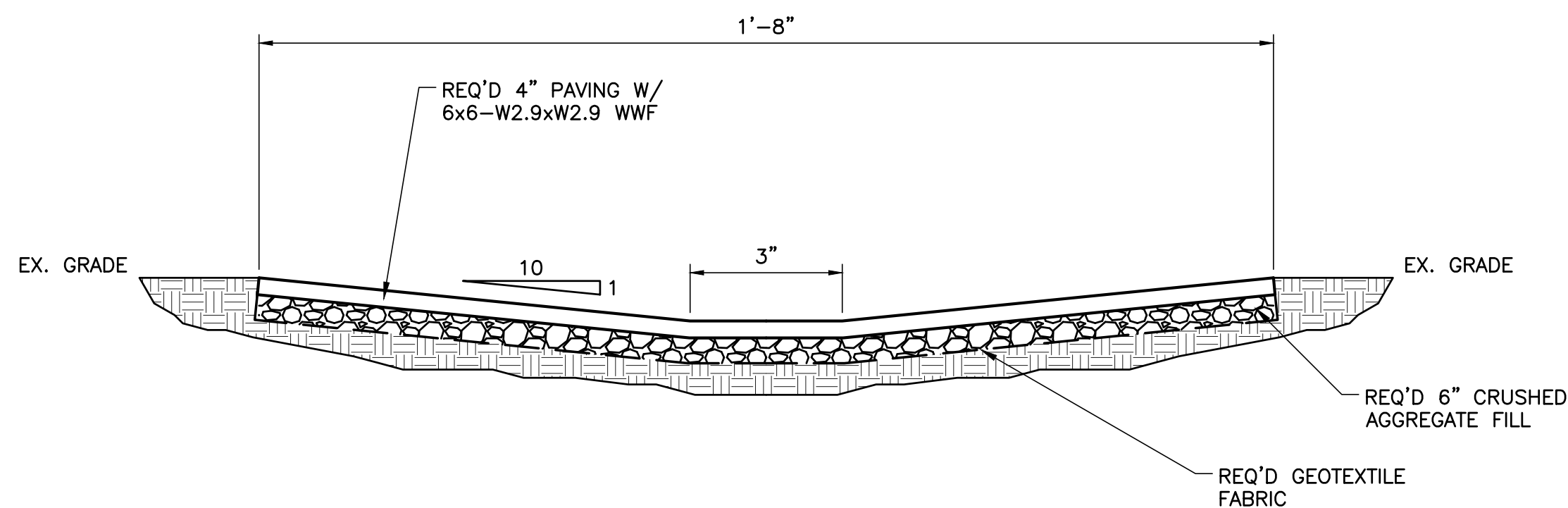
N.T.S.



\*EXCEPTION. MINIMUM CLEARANCE SHALL BE 18" BETWEEN POTABLE WATER AND SANITARY SEWER LINES.

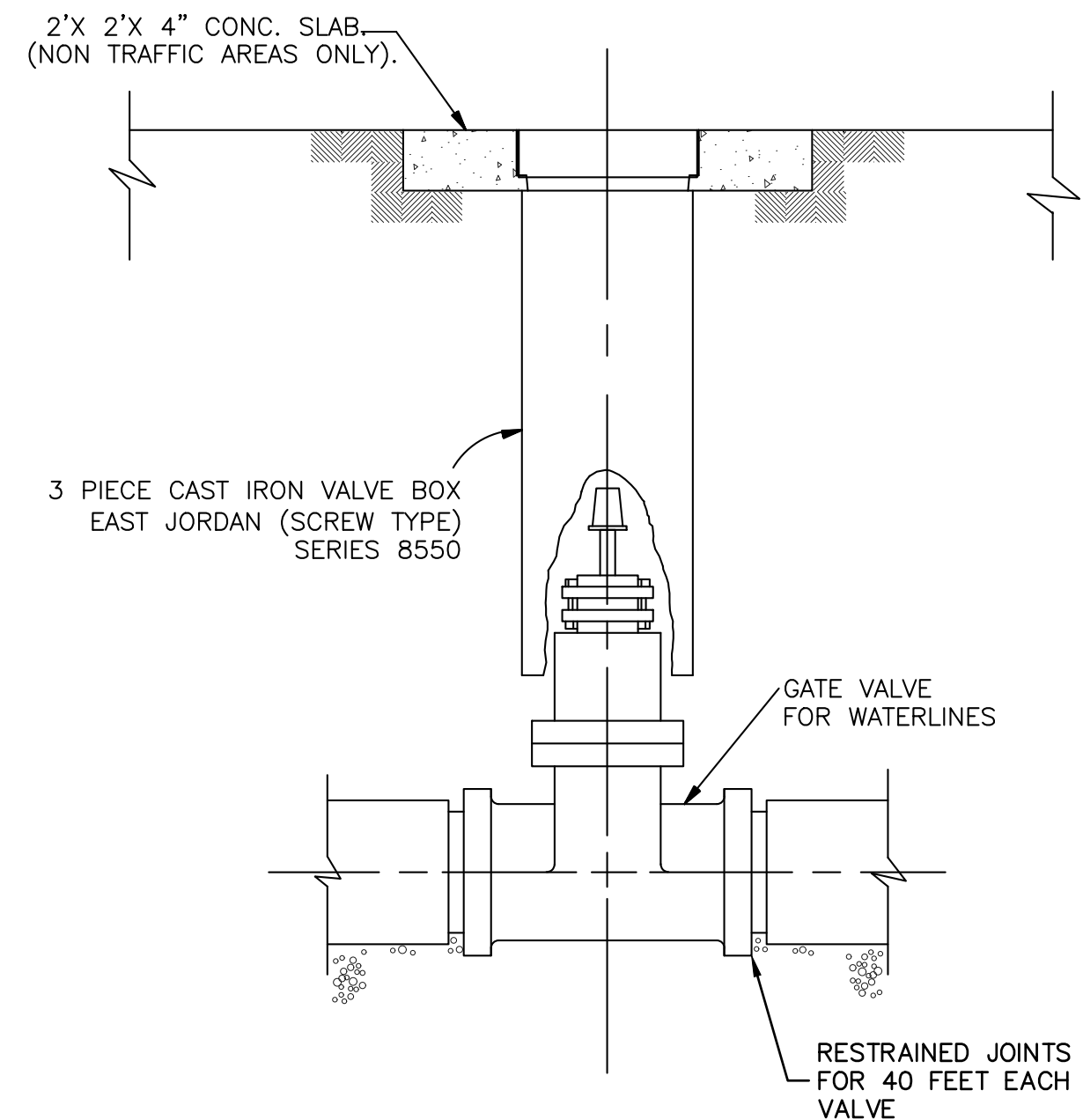
**TYPICAL VERTICAL (OVER) OR HORIZONTAL OFFSET DETAILS FOR WATER AND SEWER FORCE MAINS**

N.T.S.



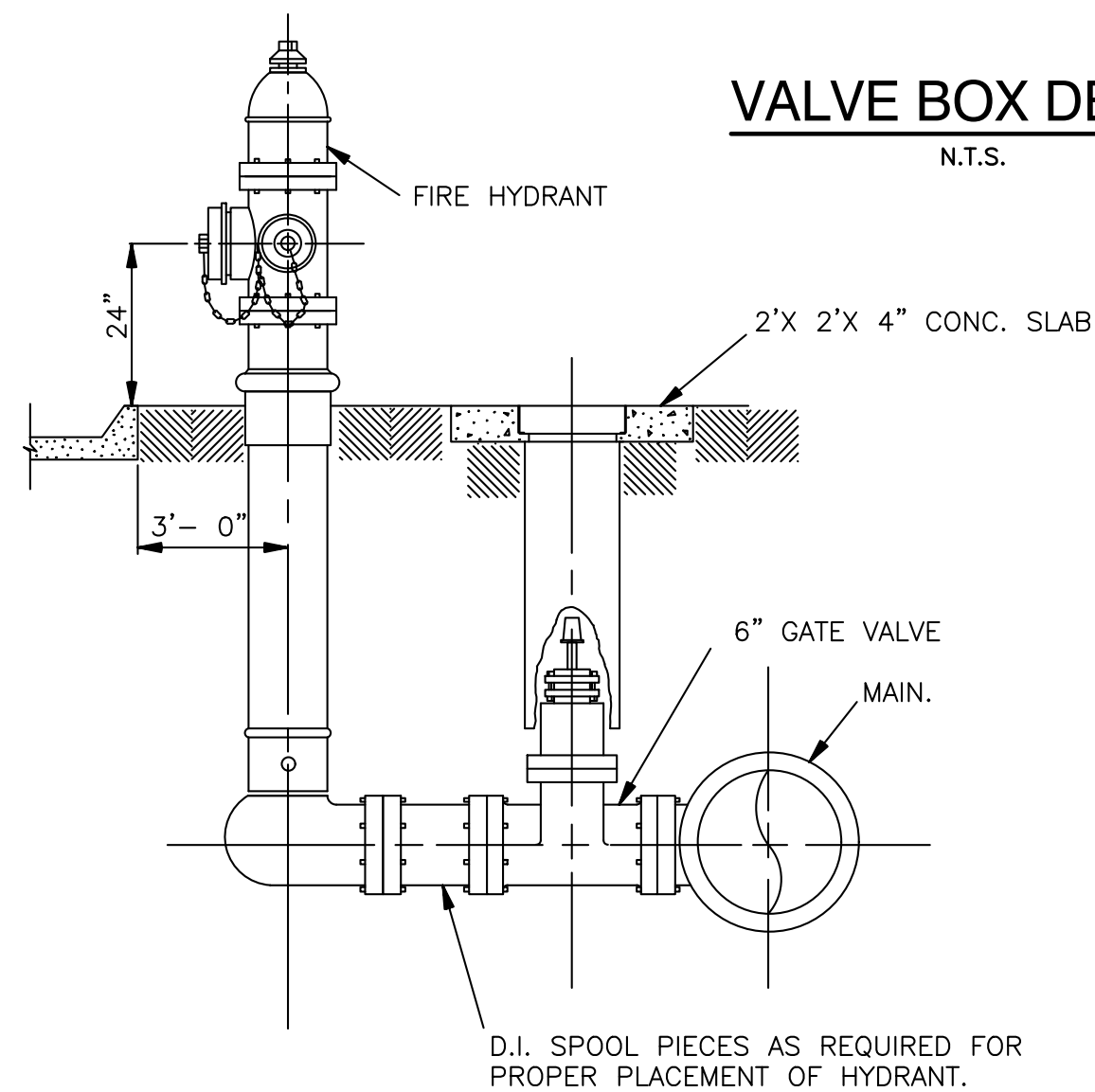
**OUTFALL SWALE DETAIL**

SCALE: 3/8" = 1'-0"



**VALVE BOX DETAIL**

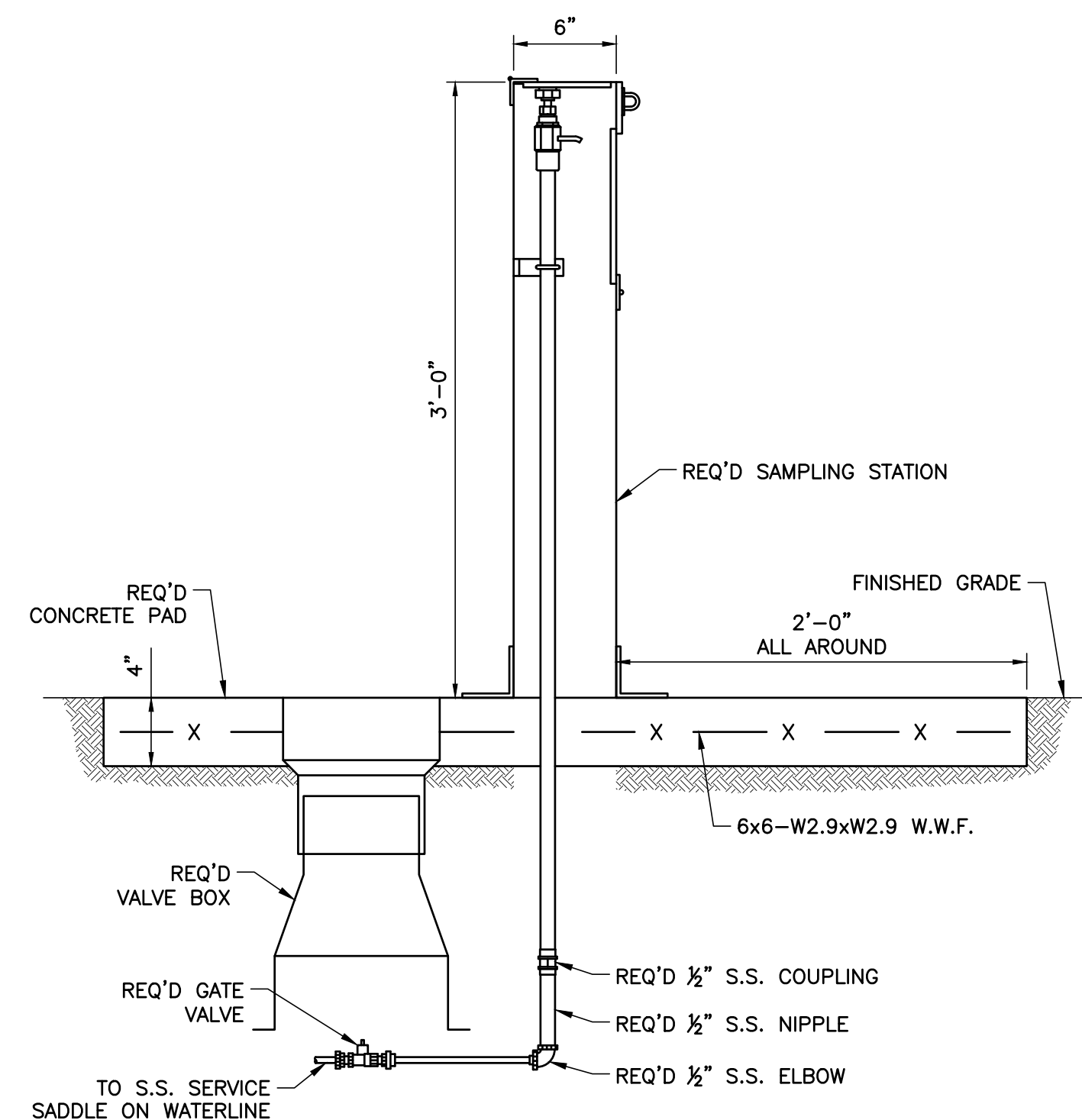
N.T.S.



**FIRE HYDRANT DETAIL**

N.T.S.

NOTE  
ALL JOINTS SHALL BE RESTRAINED BELOW GROUND AND FLANGED ABOVE GROUND.



**SAMPLING STATION DETAIL**

SCALE: 1-1/2" = 1'-0"

**WATER LINE AND SEWER LINE NOTES:**

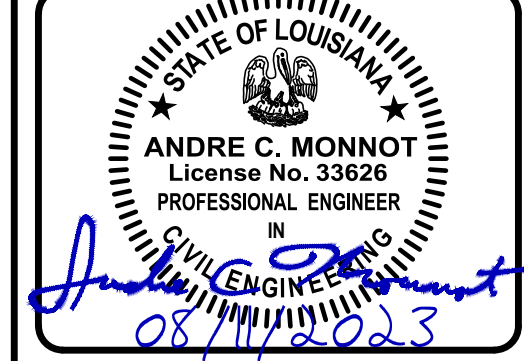
- BACKFILL WITH SELECT EXCAVATED MATERIAL FREE OF STUMPS, DEBRIS, AND VOIDS. BACKFILL MATERIAL BENEATH AND WITHIN 24 INCHES OF ROADWAY AND DRIVEWAY PAVING SHALL CONSIST OF GRANULAR MATERIAL COMPACTED TO 95% STANDARD PROCTOR (ASTM D698).
- PROVIDE BELL HOLES AT EACH JOINT.
- AFTER BACK FILLING, RESTORE SURFACE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
- WHEN EXCAVATING IN A PAVED AREA, SAW CUT THE EXISTING PAVEMENT WITH A NEAT VERTICAL CUT.
- WIRE TRACER REQUIRED ON ALL WATER MAINS.
- RESTRAINED JOINTS ARE REQUIRED AT ALL FITTINGS AND AT ALL BURIED JOINTS.
- FIRE HYDRANTS SHALL BE MUELLER SUPER CENTURION 250 HS.
- SAMPLING STATION SHALL BE MAIN GUARD #66 WC AS MANUFACTURED BY KUPFERLE WATER SOLUTIONS.



DEPT. OF UTILITIES  
ST. TAMMANY PARISH  
GOVERNMENT  
620 N. TYLER STREET  
COVINGTON, LA 70433

DATE:	DESCRIPTION OF REVISION	No.

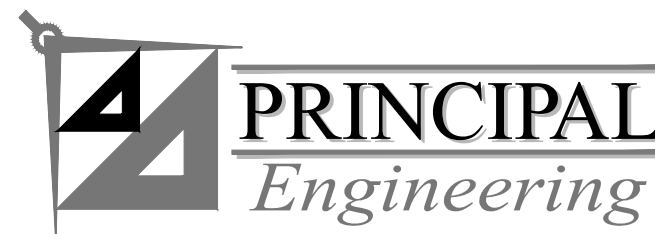
DESIGNED BY: ACM
DRAWN BY: LMR
CHECKED BY: TMS
SUBMITTED BY: PRINCIPAL ENG
PROJECT No.: TU22000204
ISSUE DATE: AUG 2023
APPROVED BY: TU22000209
SHEET SIZE: ANSI D
SCALE:



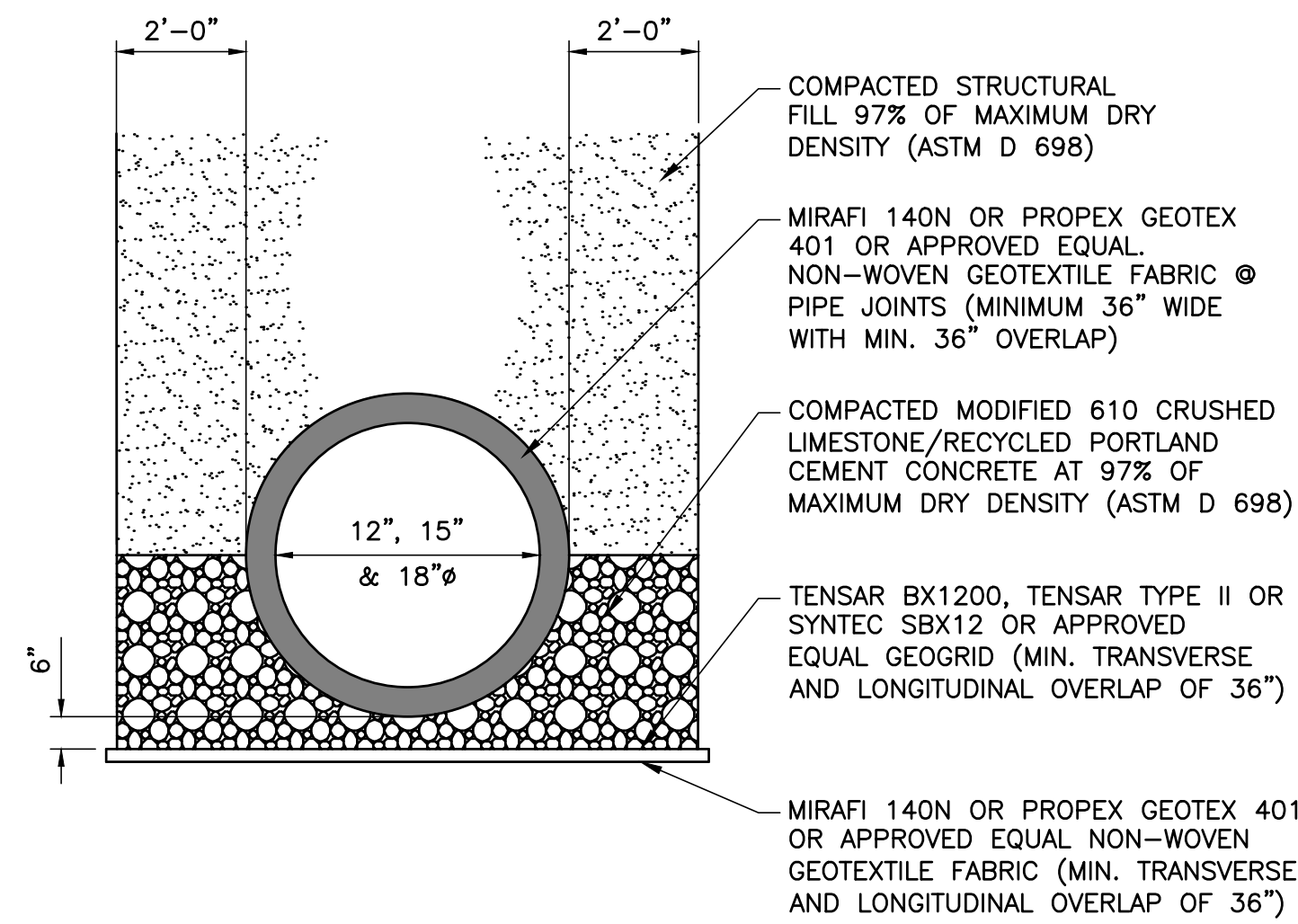
CROSS GATES WATER SYSTEM  
NEW ELEVATED STORAGE TANK  
SLIDELL, LOUISIANA  
PROJECT No.: TU22000204  
TU22000209

SITE DETAILS

SHEET NO.  
**10**  
SHEET 10 OF 24

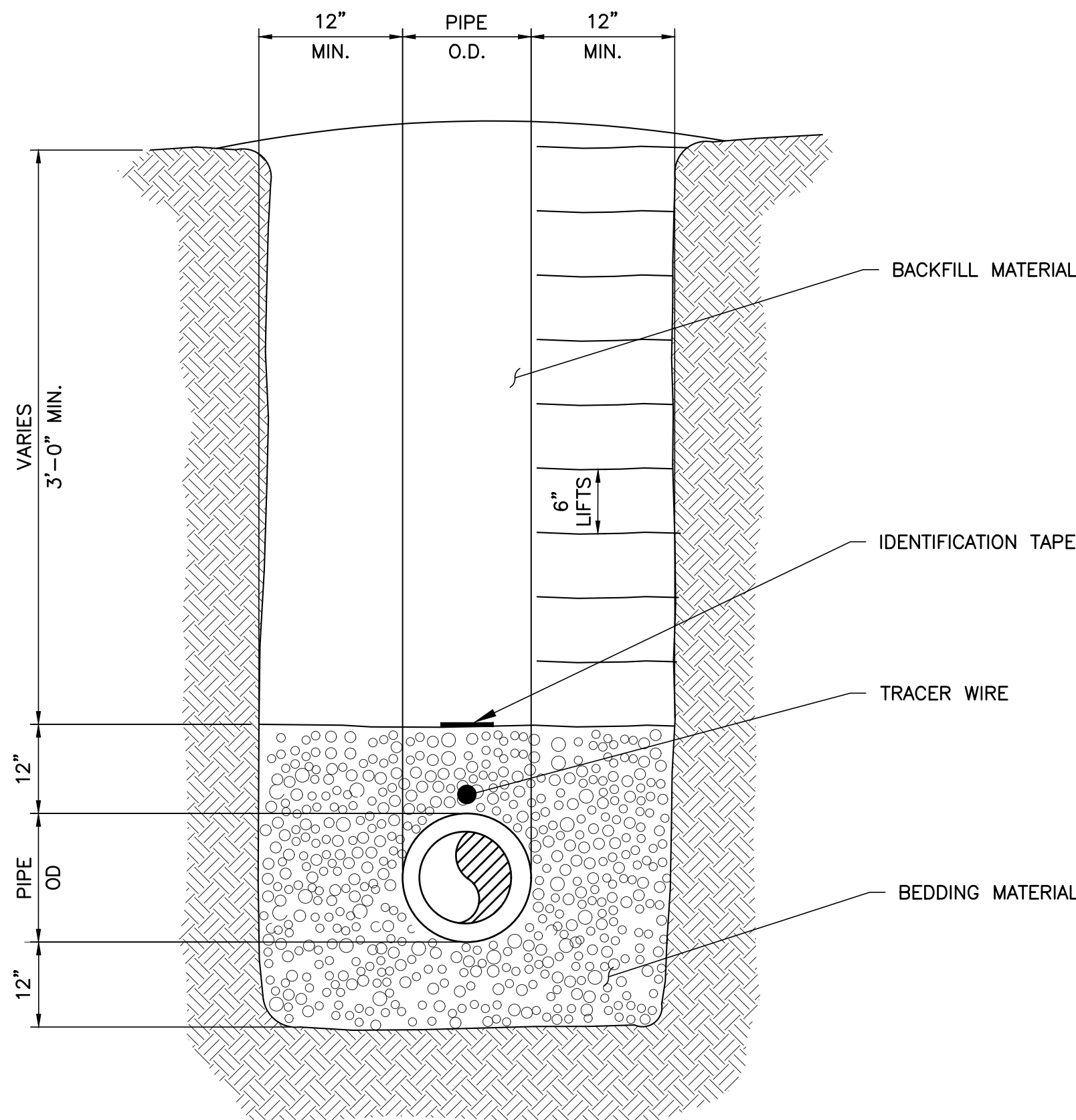






**DRAIN LINE TRENCH SECTION**

SCALE: N.T.S.

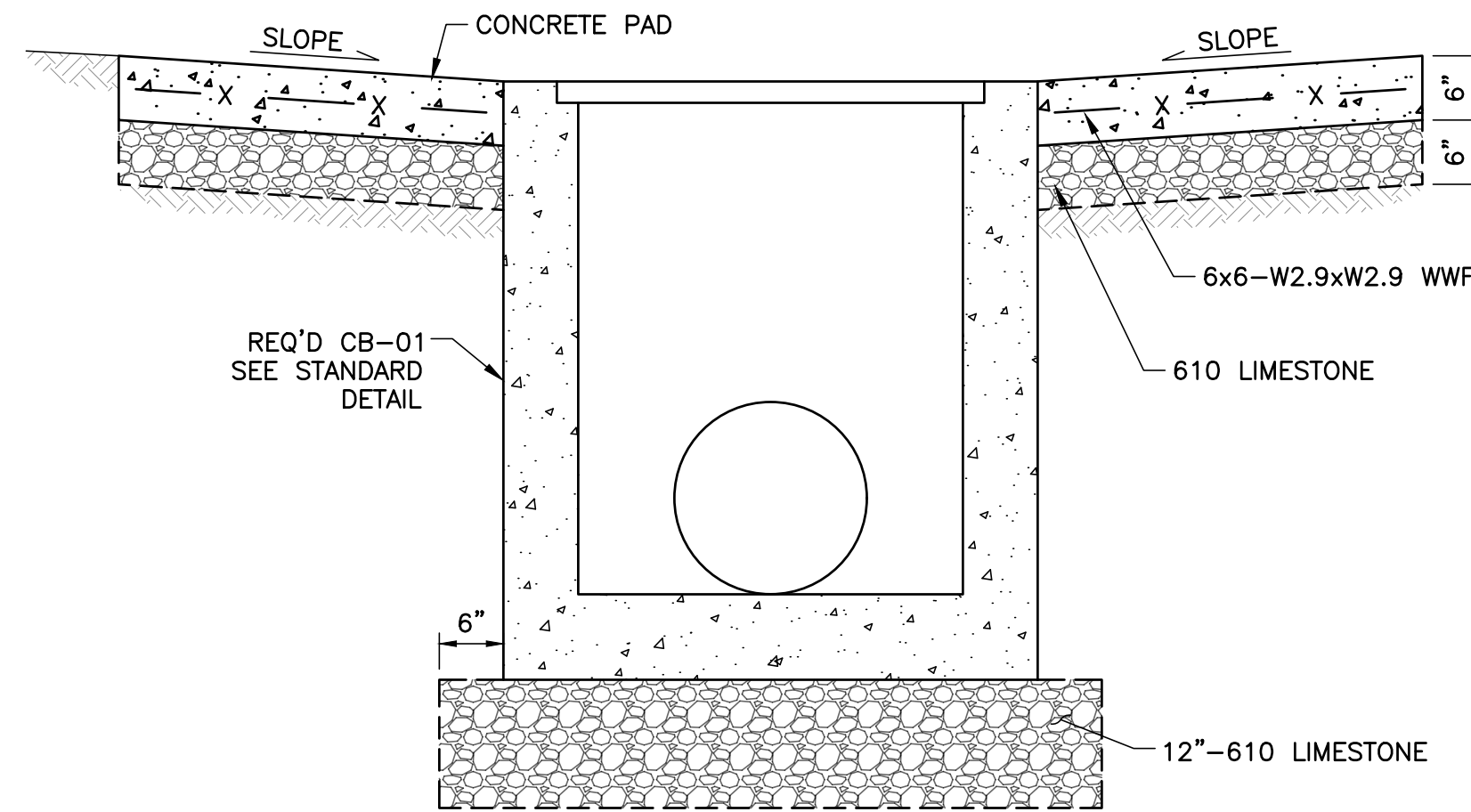


**WATER & SEWER LINE TRENCH DETAIL**

SCALE: N.T.S.

**NOTES:**

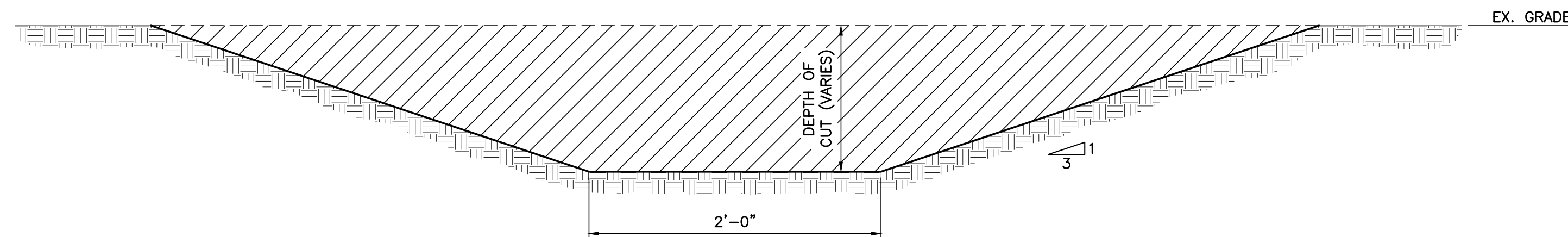
1. REQUIRED BEDDING MATERIAL SHALL BE COMPACTED GRANULAR MATERIAL MIN. DENSITY 95% STANDARD PROCTOR (ASTM D698) PLACED IN 6" MAX. LAYERS.
2. BELL HOLES SHALL BE PROVIDED AT EACH JOINT. WHERE GROUND WATER OR UNSTABLE TRENCH BOTTOM EXISTS, TRENCH BOTTOM SHALL BE STABILIZED (ASTM D2321) TO PROVIDE A WORKING PLATFORM.
3. REQUIRED BACKFILL MATERIAL MAY BE SELECT EXCAVATED MATERIAL FREE OF STUMPS, DEBRIS, AND VOIDS FOR NON-PAVED AREA WITHIN 24 INCHES OF THE ROADWAY AND DRIVEWAY. MATERIAL SHALL BE MOUNDED OVER TRENCH.
4. REQUIRED BACKFILL MATERIAL SHALL BE COMPACTED GRANULAR MATERIAL WITHIN THE ROADWAY AND DRIVEWAY, MIN. DENSITY 95% STANDARD PROCTOR (ASTM D698), PLACED IN 6" MAX. LAYERS.
5. TRENCH DETAIL SHOWN SHALL BE MINIMUM REQUIREMENTS TO SAFEGUARD THE INTEGRITY OF THE UTILITY LINE. THE CONTRACTOR SHALL PROVIDE SUFFICIENT SHEETING AND BRACING TO PROVIDE SAFE WORKING CONDITIONS FOR ALL WORKERS.



NOTE:  
LIMESTONE TO BE COMPACTED TO 97% OF MAXIMUM DRY DENSITY PER ASTM D698.

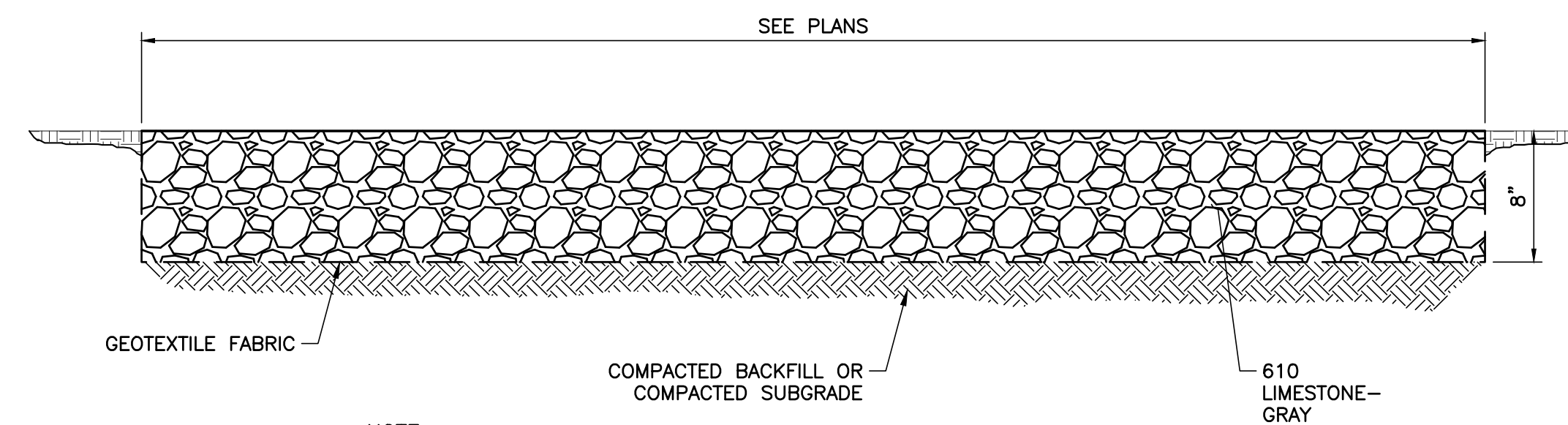
**CB-01 CONCRETE APRON**

SCALE: N.T.S.



**TYPICAL SWALE SECTION (OZONE PINES)**

SCALE: N.T.S.



NOTE:  
LIMESTONE TO BE COMPACTED TO 97% OF MAXIMUM DRY DENSITY PER ASTM D698.

**TYPICAL AGGREGATE SURFACE COURSE SECTION**

SCALE: N.T.S.



DEPT. OF UTILITIES  
ST. TAMMANY PARISH  
GOVERNMENT  
620 N. TYLER STREET  
COVINGTON, LA 70433

DATE:	DESCRIPTION OF REVISION

DESIGNED BY: ACM	ANSI D
DRAWN BY: LMR	SCALE:
CHECKED BY: TMS	
SUBMITTED BY: PRINCIPAL ENG	
PROJECT No.: TU22000204	
ISSUE DATE: AUG 2023	
APPROVED BY:	
SHEET No.: TU22000209	

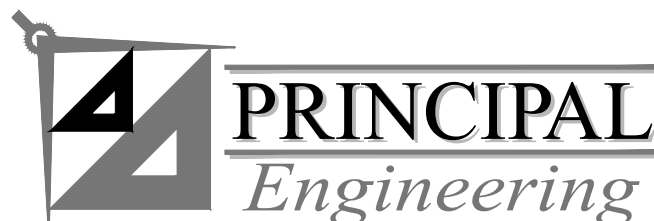
STATE OF LOUISIANA  
  
 ANDRE C. MONNOT  
 License No. 33626  
 PROFESSIONAL ENGINEER  
 IN  
 CIVIL ENGINEERING  
 08/17/2023

CROSS GATES WATER SYSTEM  
 NEW ELEVATED STORAGE TANK  
 SLIDELL, LOUISIANA  
 PROJECT No.: TU22000204  
 TU22000209  
 SITE DETAILS

SHEET NO.

11

SHEET 11 OF 24

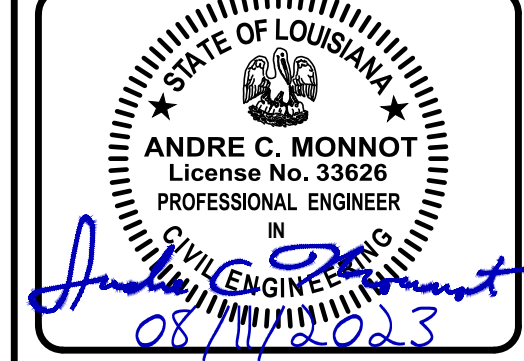




DEPT. OF UTILITIES  
ST. TAMMANY PARISH  
GOVERNMENT  
620 N. TYLER STREET  
COVINGTON, LA 70433

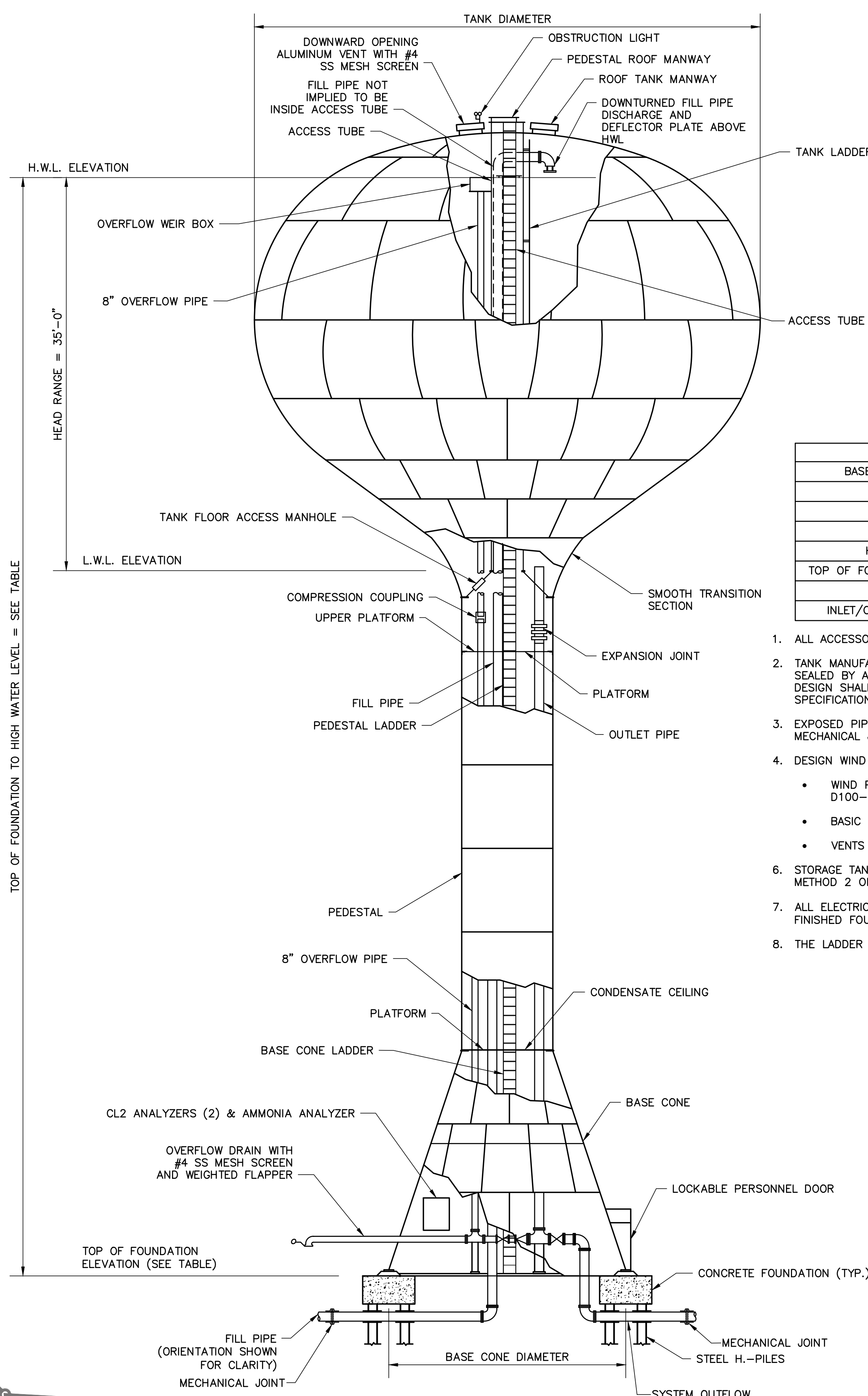
DATE:	DESCRIPTION OF REVISION	No.

DESIGNED BY: ACM	DRWN BY: LMR	CHECKED BY: TMS	SUBMITTED BY: PRINCIPAL ENG	PROJECT No.: TU22000204	ISSUE DATE: AUG 2023	APPROVED BY:	SHEET SIZE: ANSI D	SCALE:
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CROSS GATES WATER SYSTEM  
NEW ELEVATED STORAGE TANK  
SLIDELL, LOUISIANA  
PROJECT No.: TU22000204  
TU22000209  
ELEVATED TANK

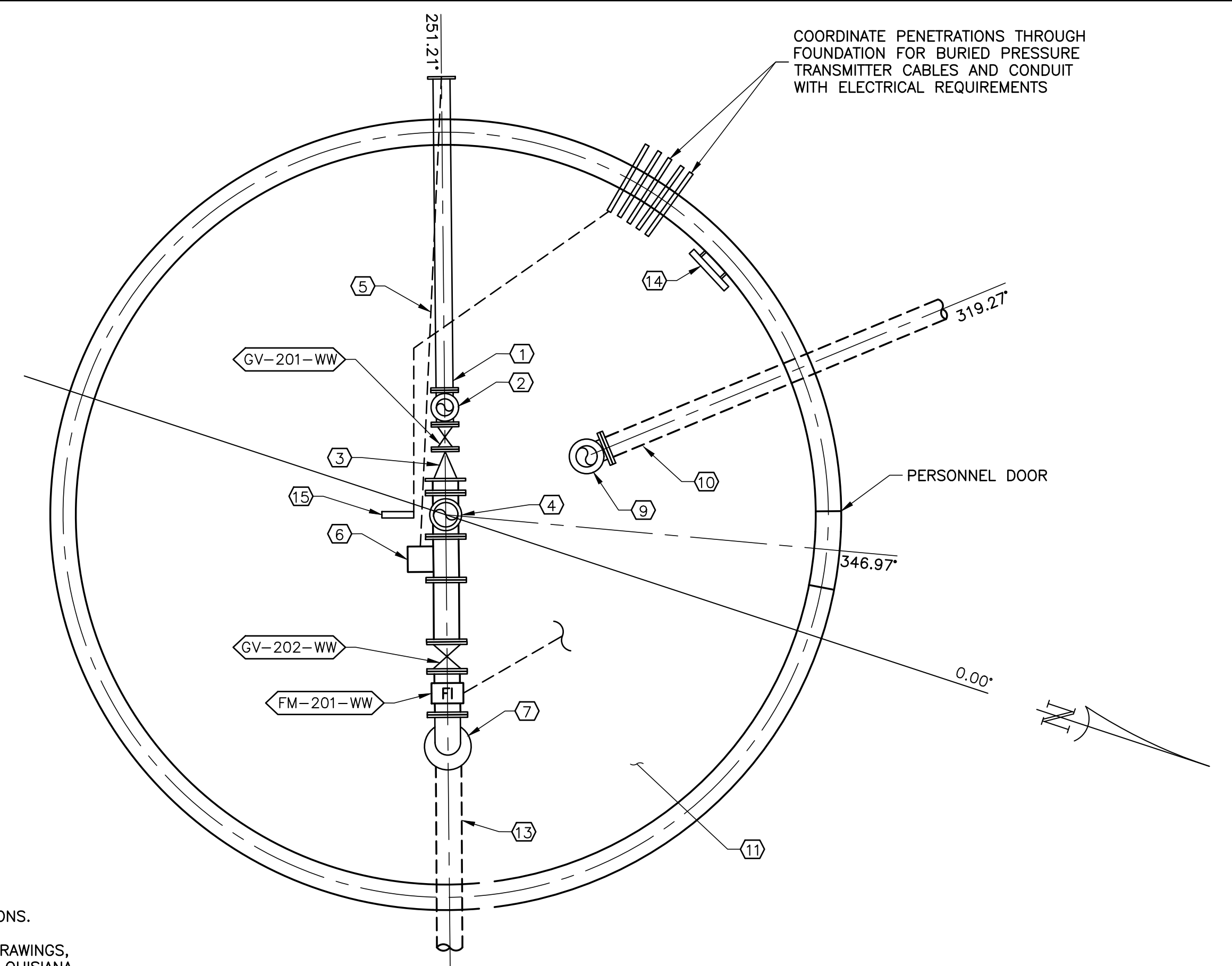
SHEET NO.  
12  
SHEET 12 OF 24



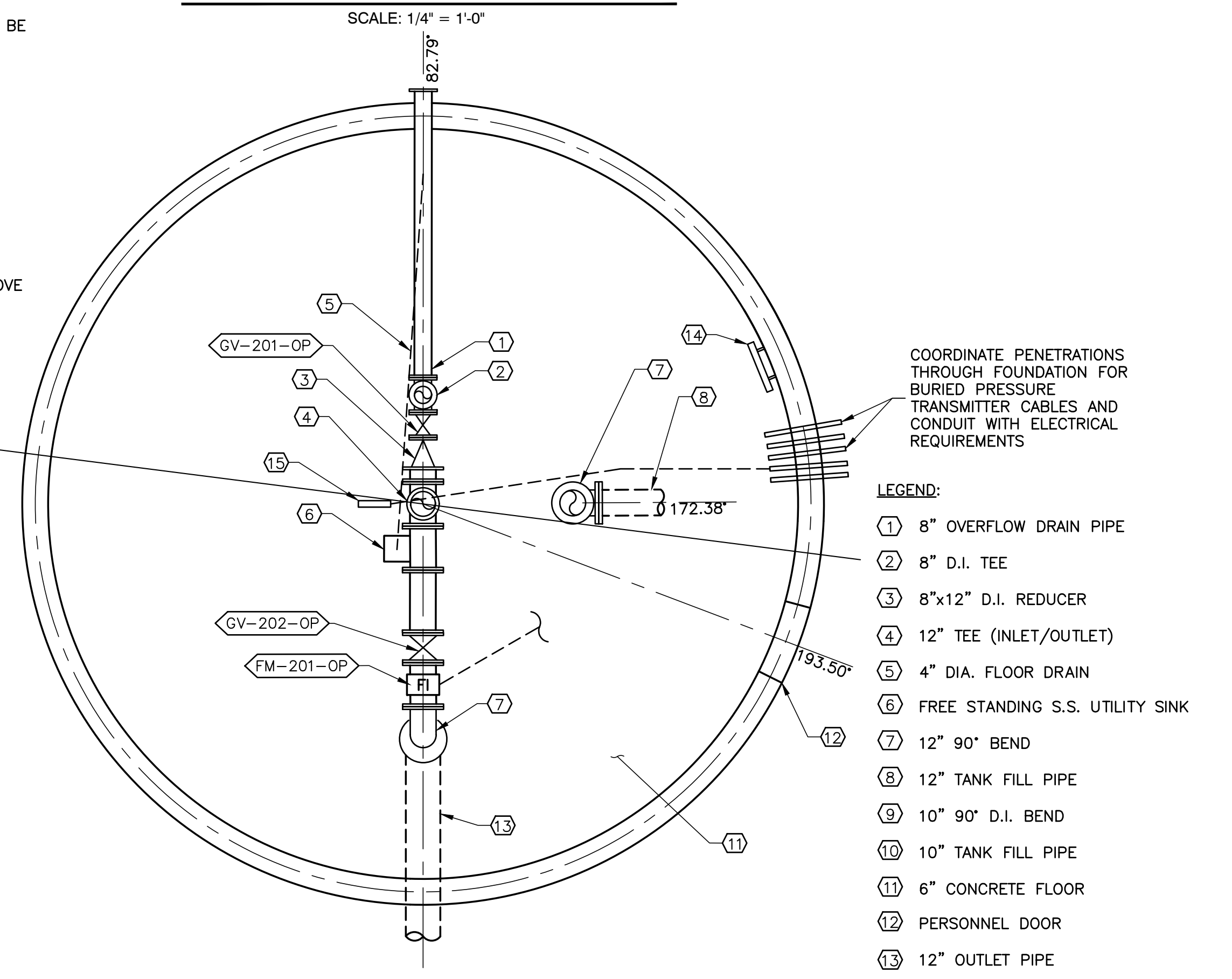
**ELEVATION**  
SCALE: N.T.S.

	WILLOW WOOD	OZONE PINES
BASE BID SIZE (GALLONS)	400,000	400,000
ALT. BID #1 SIZE	300,000	400,000
ALT. BID #2 SIZE	300,000	300,000
BASE DIA. (FT)	30	30
HIGH WATER LINE (FT)	170	168
TOP OF FOUNDATION (FT. NAVD)	13.0	15.0
FILL PIPE DIA. (IN.)	10	12
INLET/OUTLET PIPE DIA. (IN.)	12	12

- ALL ACCESSORIES TO BE INCLUDED AS SHOWN AND PER SPECIFICATIONS.
- TANK MANUFACTURER SHALL SUBMIT COMPREHENSIVE TANK DESIGN DRAWINGS, SEALED BY A PROFESSIONAL ENGINEER, LICENSED IN THE STATE OF LOUISIANA. DESIGN SHALL BE PER AWWA D100-21, THESE DRAWINGS, AND THE SPECIFICATIONS.
- EXPOSED PIPING SHALL BE FLANGED DUCTILE IRON. BURIED PIPING SHALL BE MECHANICAL JOINT DUCTILE IRON PIPING, RESTRAINED JOINT.
- DESIGN WIND LOAD:
  - WIND PRESSURE SHALL BE DETERMINED IN ACCORDANCE WITH AWWA D100-21, SECTION 3.1.4.
  - BASIC WIND SPEED SHALL BE 130 MPH.
  - VENTS SHALL OPEN DOWNWARD.
- STORAGE TANK SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA C652 METHOD 2 OR 3.
- ALL ELECTRIC EQUIPMENT AND PANELS SHALL BE A MINIMUM OF 2'-0" ABOVE FINISHED FOUNDATION.
- THE LADDER ARRANGEMENT SHALL BE ACCEPTABLE TO THE ENGINEER.



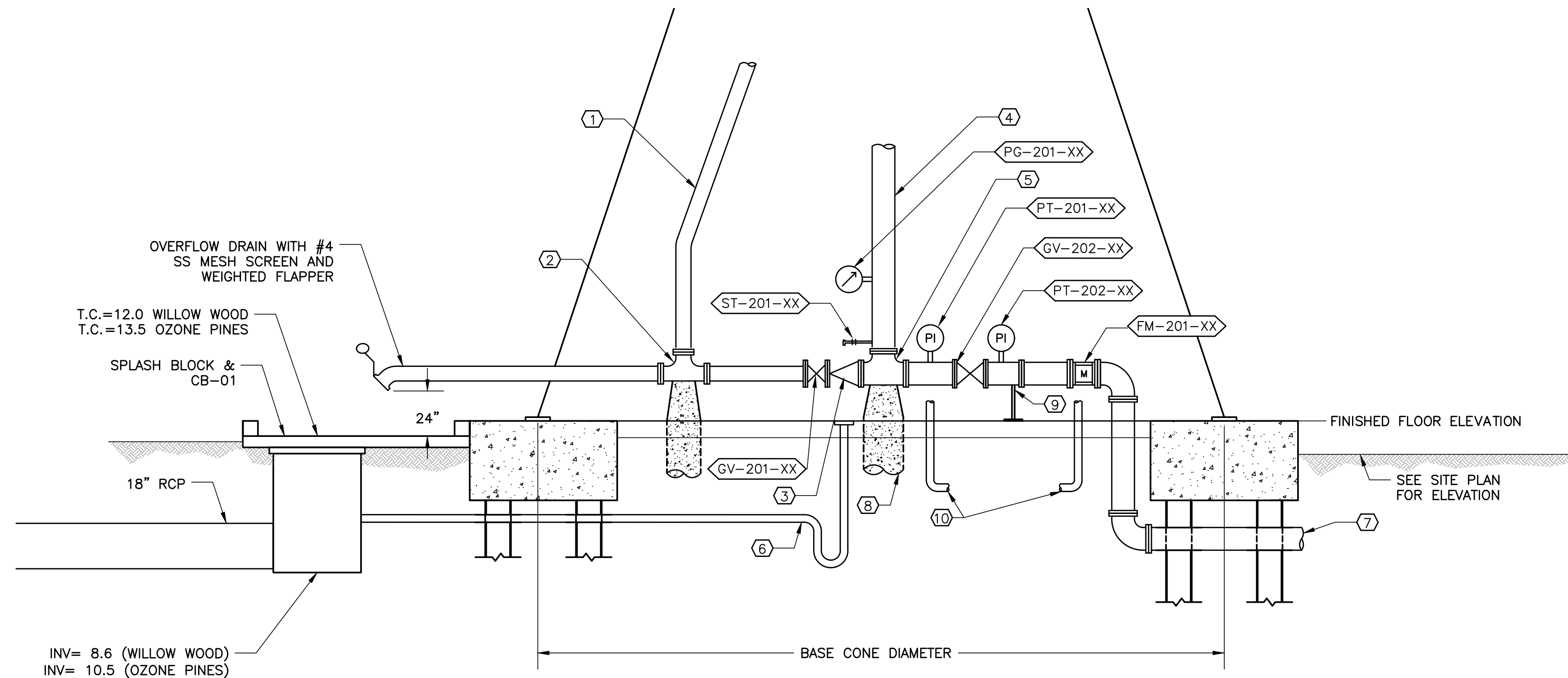
**WILLOW WOOD BASE PLAN**  
SCALE: 1/4" = 1'-0"



**OZONE PINES BASE PLAN**  
SCALE: 1/4" = 1'-0"

- LEGEND:
- 8" OVERFLOW DRAIN PIPE
  - 8" D.I. TEE
  - 8"x12" D.I. REDUCER
  - 12" TEE (INLET/OUTLET)
  - 4" DIA. FLOOR DRAIN
  - FREE STANDING S.S. UTILITY SINK
  - 12" 90° BEND
  - 12" TANK FILL PIPE
  - 10" 90° D.I. BEND
  - 10" TANK FILL PIPE
  - 6" CONCRETE FLOOR
  - PERSONNEL DOOR
  - 12" OUTLET PIPE
  - FABRICATED STEEL MOUNTING BOARD (EQUIPMENT AND ELECTRICAL PANEL)
  - ANALYZER BACKBOARD FREE STANDING, STEEL FABRICATED





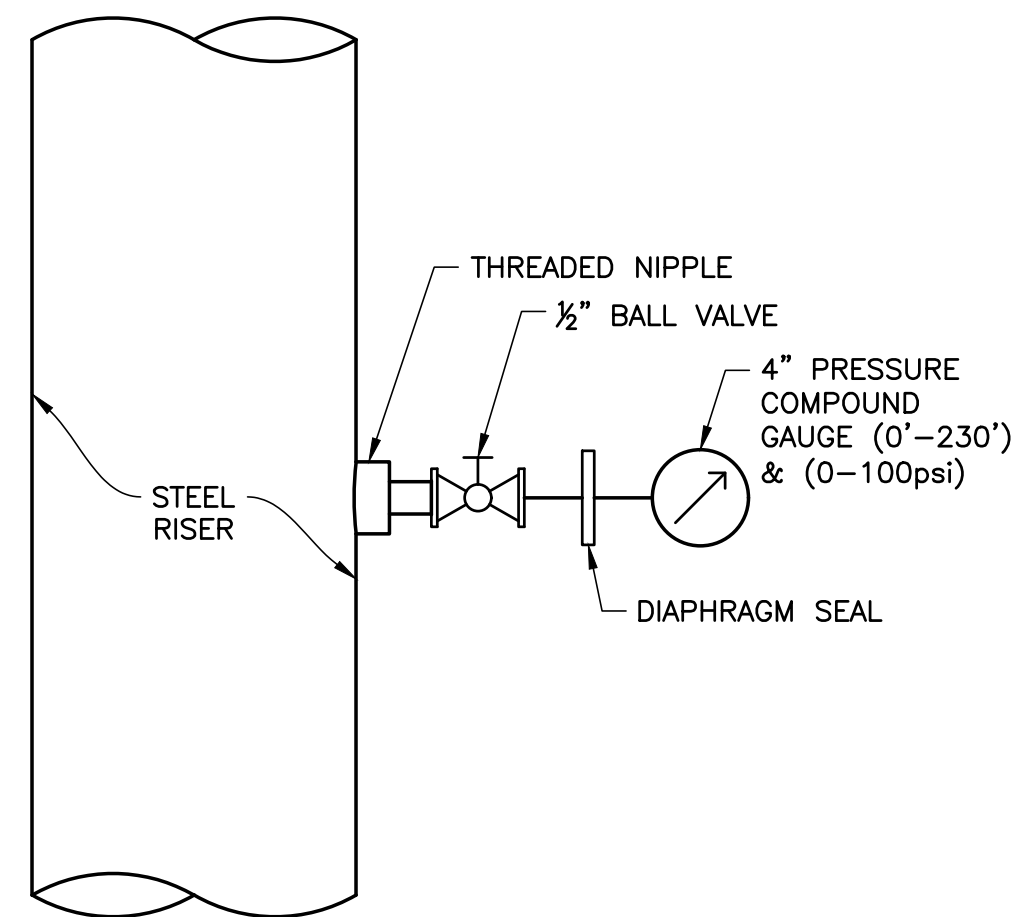
INV= 8.6 (WILLOW WOOD)  
INV= 10.5 (OZONE PINES)

- LEGEND:**
- ① 8" OVERFLOW
  - ② 8"x8"x8" TEE
  - ③ 8"x12" ECCENTRIC REDUCER
  - ④ 12" RISER
  - ⑤ 12"x12"x12" TEE
  - ⑥ 4" FLOOR DRAIN PIPE, SCH 80 PVC
  - ⑦ 12" SYSTEM INFLOW/OUTFLOW
  - ⑧ REINFORCED CONCRETE SADDLE
  - ⑨ S.S. PIPE SUPPORT
  - ⑩ CONTROL CONDUITS

**INFLOW/OUTFLOW RISER DETAILS**

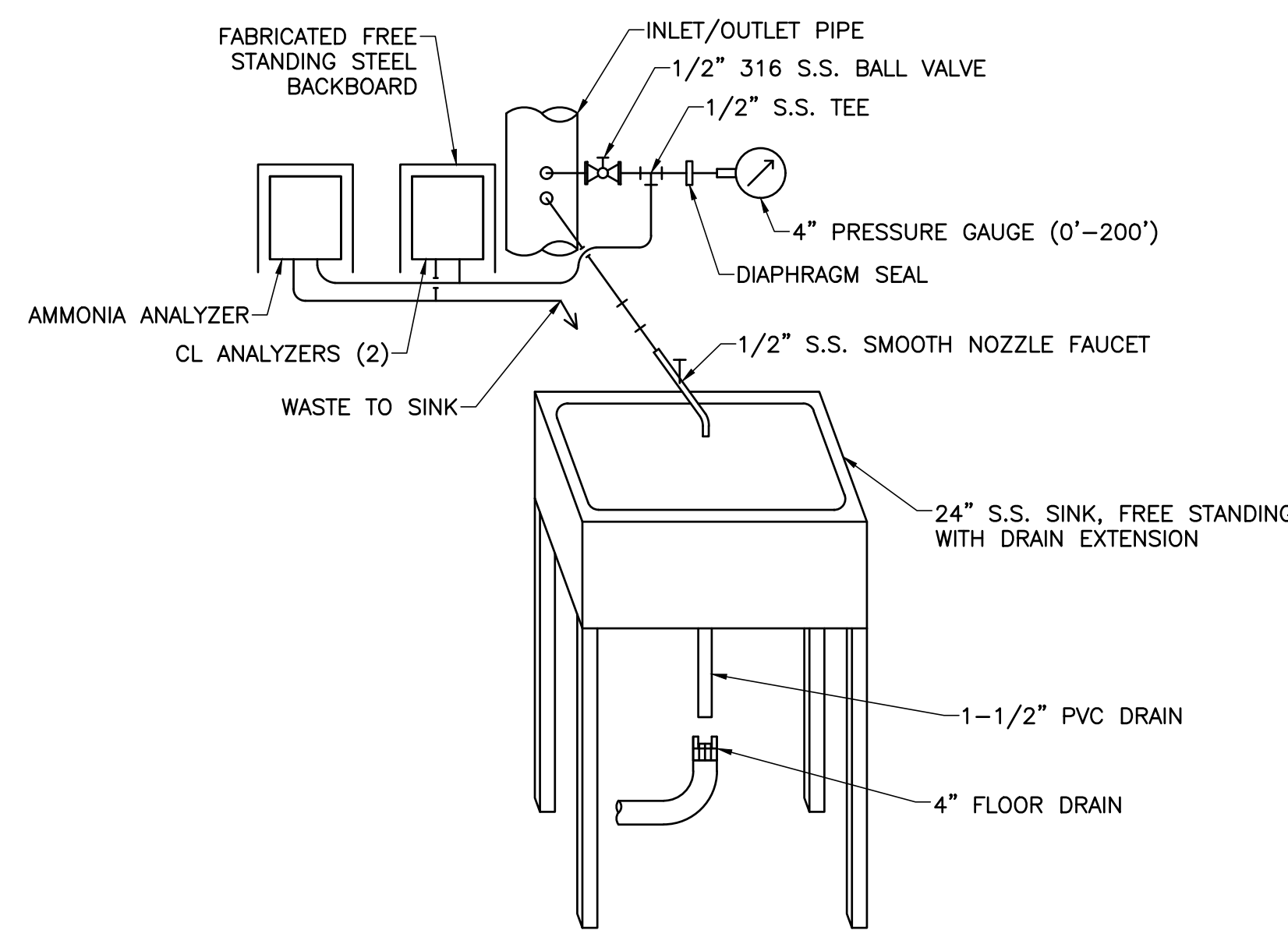
SCALE: N.T.S.

- NOTES:**
1. ABOVE GROUND PIPE JOINTS SHALL BE FLANGED D.I. BELOW GROUND PIPE JOINTS SHALL BE RESTRAINED MECHANICAL D.I.
  2. PRESSURE TRANSMITTER LOCATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
  3. PROVIDE THRU-FLOOR CONDUITS FOR INSTRUMENT CABLES FROM INFLOW/OUTFLOW PIPE TO PERIMETER.
  4. SLOPE 4" DRAIN TO A MINIMUM SLOPE OF 0.01 FT/FT.



**TYPICAL PRESSURE GAUGE DETAIL**

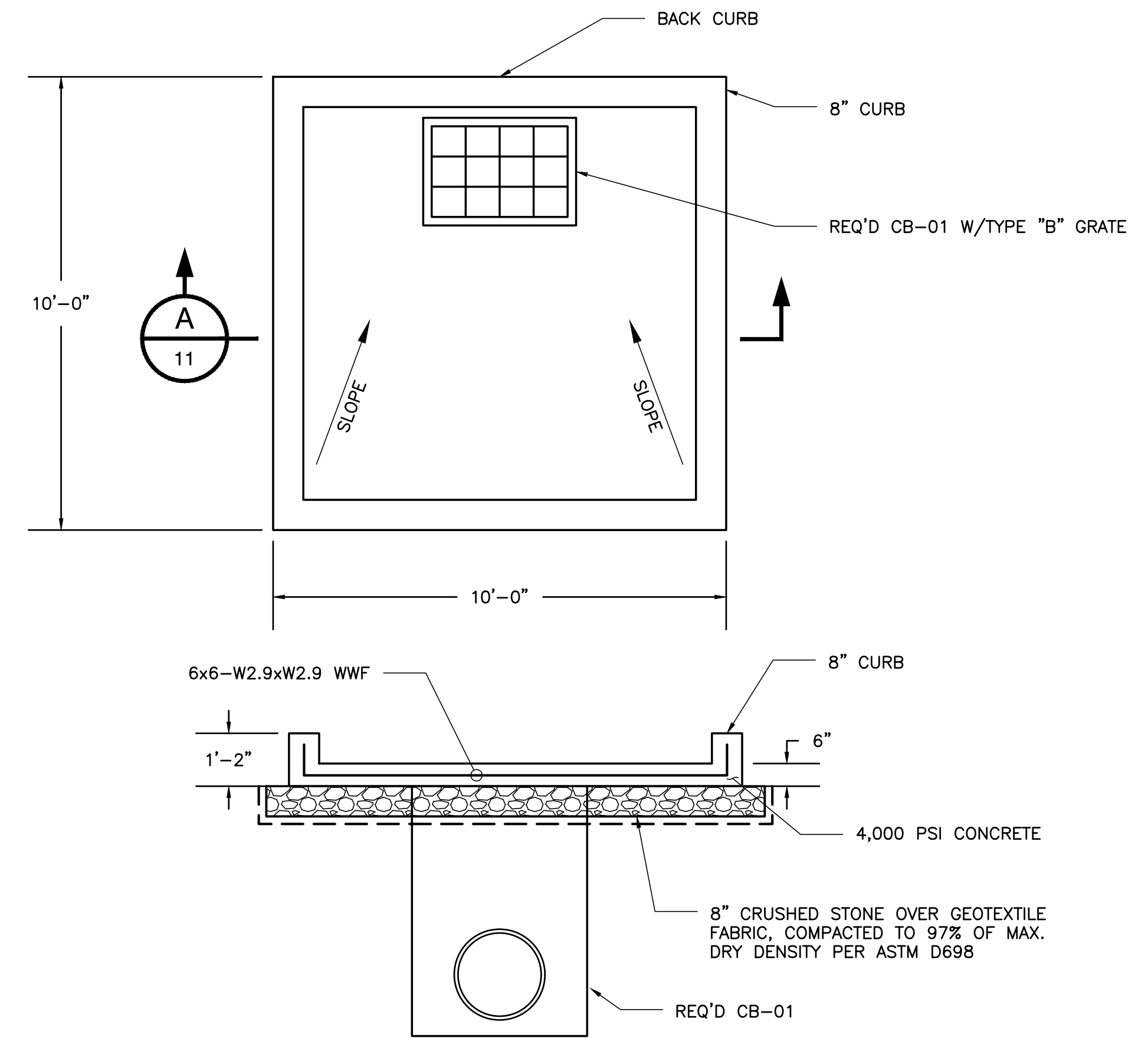
SCALE: N.T.S.



**SINK DETAIL**

SCALE: N.T.S.

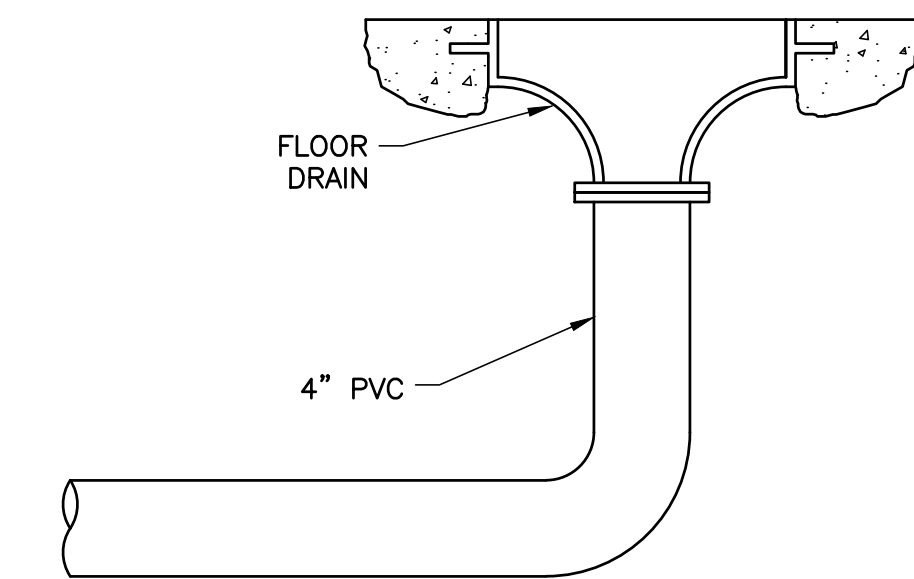
\*REQUIRED AT THE BASE OF EACH TANK



**A SECTION**

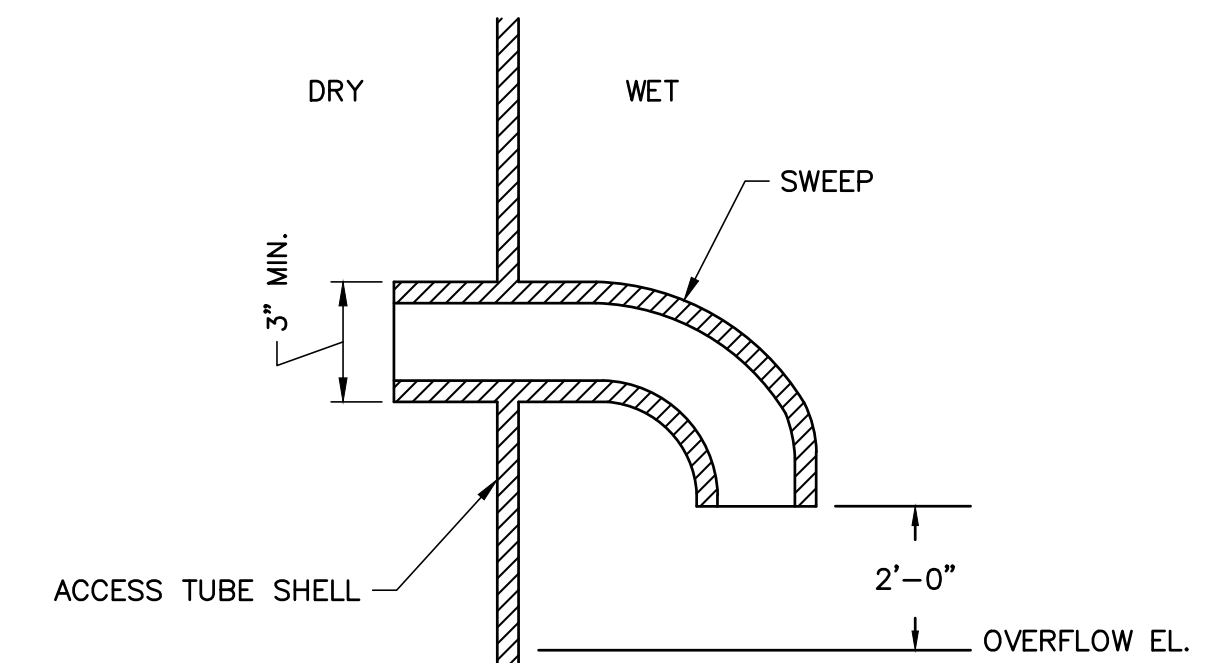
**SPLASH BLOCK**

SCALE: N.T.S.



**FLOOR DRAIN DETAIL**

SCALE: N.T.S.



**POWER CABLE PENETRATION**

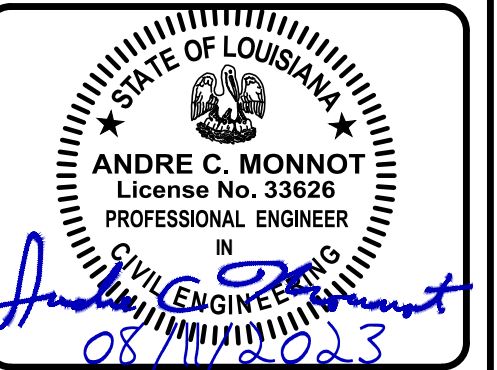
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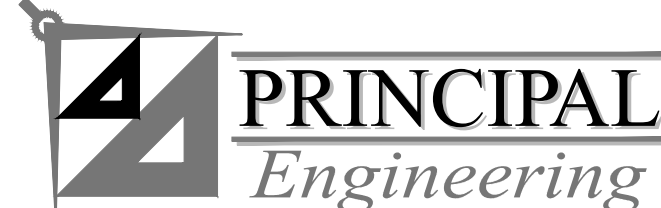
DEPT. OF UTILITIES  
ST. TAMMANY PARISH  
GOVERNMENT  
620 N. TYLER STREET  
COVINGTON, LA 70433

No.	DATE	DESCRIPTION OF REVISION

DESIGNED BY:	ACM
DRAWN BY:	LMR
CHECKED BY:	TMS
SUBMITTED BY:	PRINCIPAL ENG
PROJECT No.:	TU22000204
ISSUE DATE:	AUG 2023
APPROVED BY:	TU22000209
SHEET SIZE:	ANSI D
SCALE:	



CROSS GATES WATER SYSTEM  
NEW ELEVATED STORAGE TANK  
SLIDELL, LOUISIANA  
PROJECT No.: TU22000204  
TU22000209  
TANK DETAILS

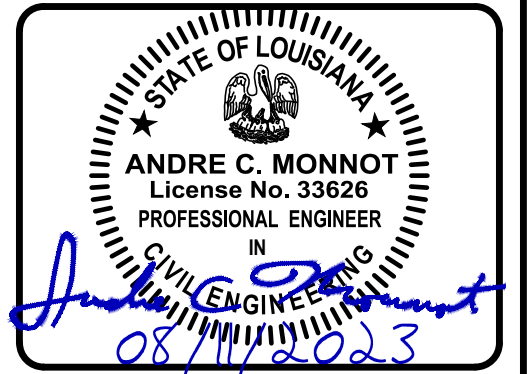




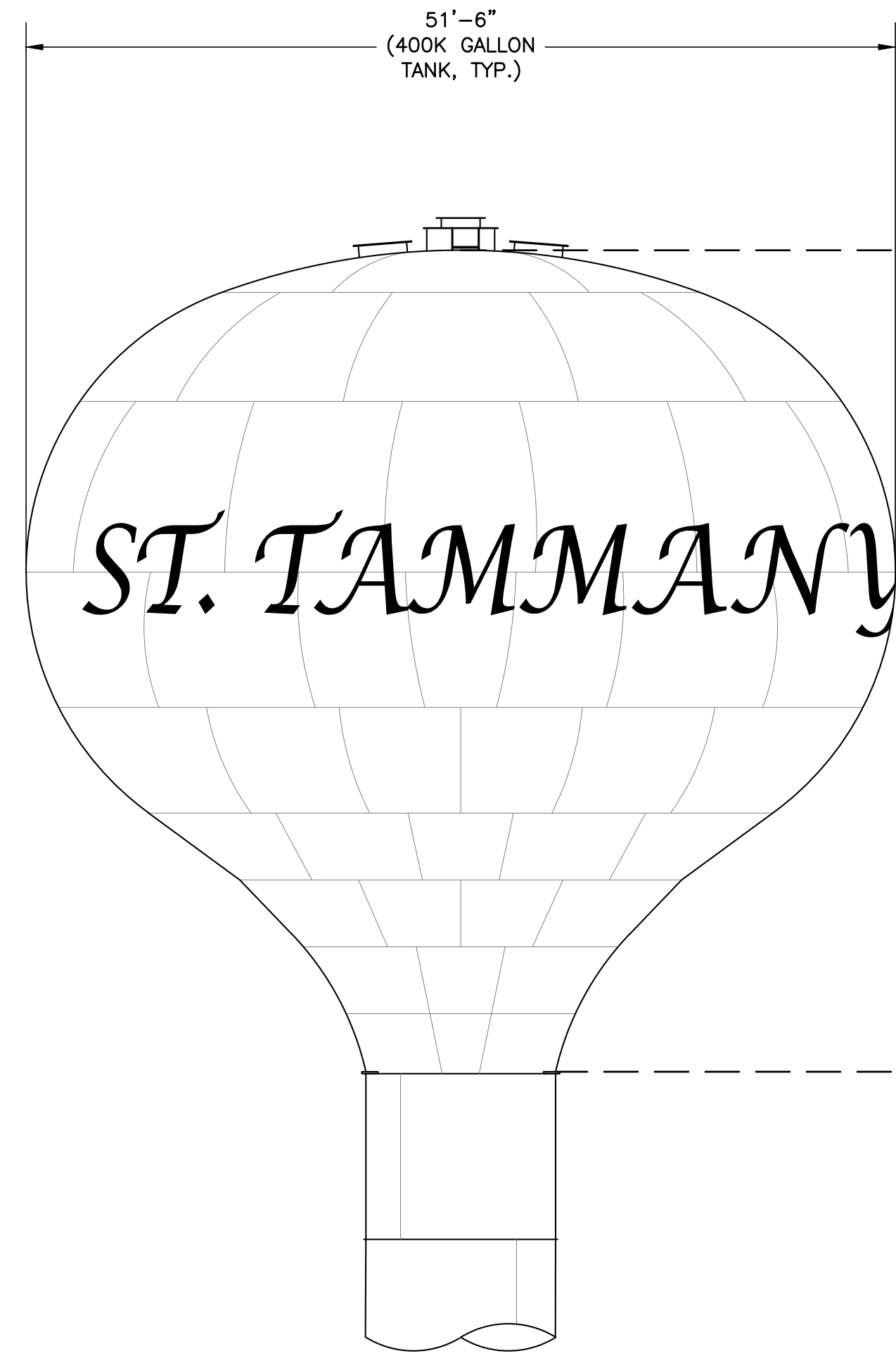
DEPT. OF UTILITIES  
ST. TAMMANY PARISH  
GOVERNMENT  
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COVINGTON, LA 70433

No.	DESCRIPTION OF REVISION	DATE

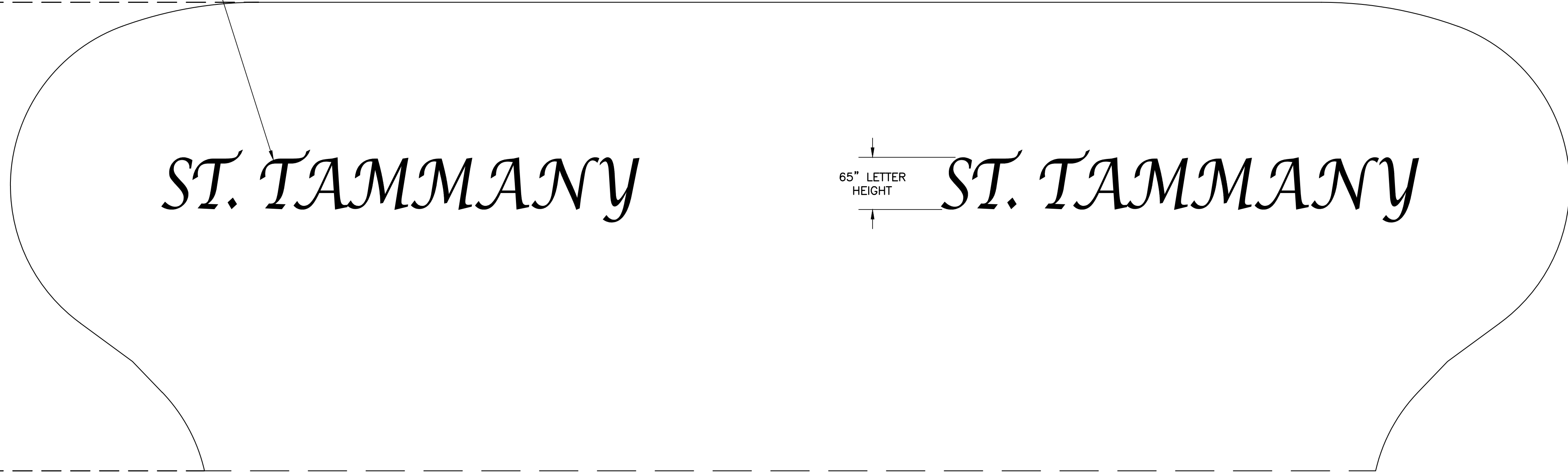
DESIGNED BY: ACM	CHECKED BY: TMS	SUBMITTED BY: PRINCIPAL ENG	PROJECT No.: TU22000204	ISSUE DATE: AUG. 2023	APPROVED BY: ANS D	SHEET SIZE: ANSI D	SCALE:
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CROSS GATES WATER SYSTEM NEW ELEVATED STORAGE TANK SLIDELL, LOUISIANA PROJECT No.: TU22000204 TU22000209	TANK DETAILS
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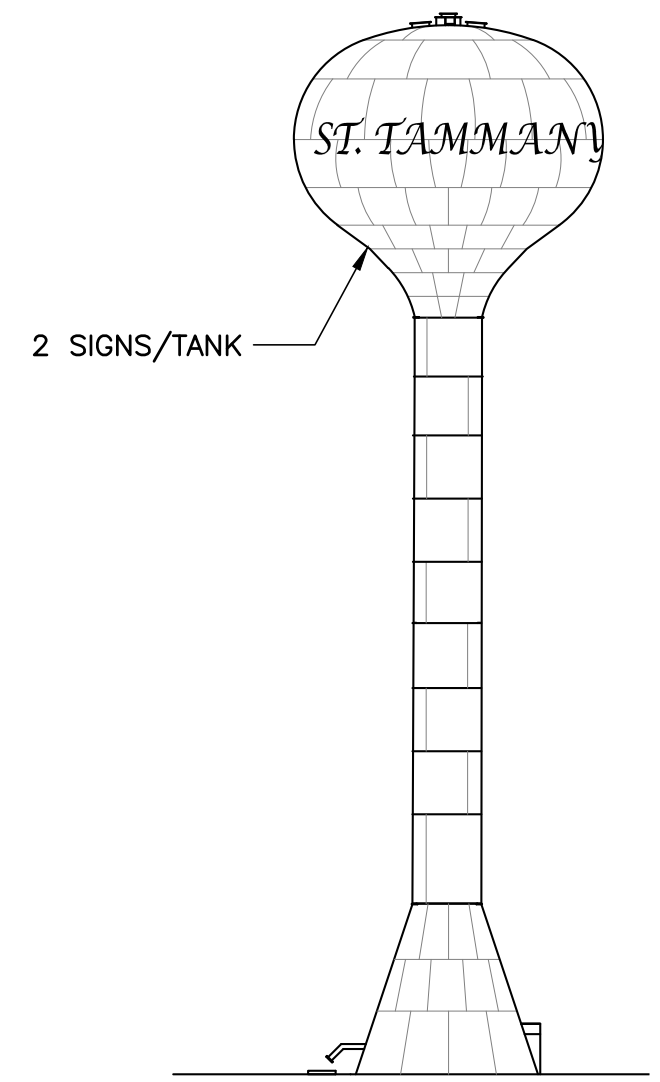


FONT: LUCIDA CALLIGRAPHY



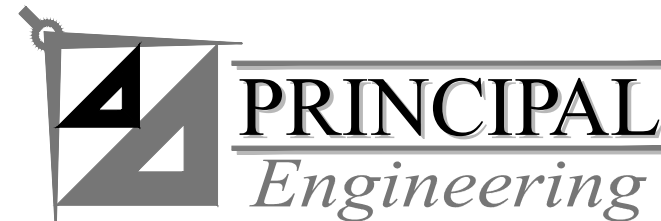
### TANK LETTERING DETAIL

SCALE: N.T.S.



### TANK LETTERING ELEVATION

SCALE: N.T.S.



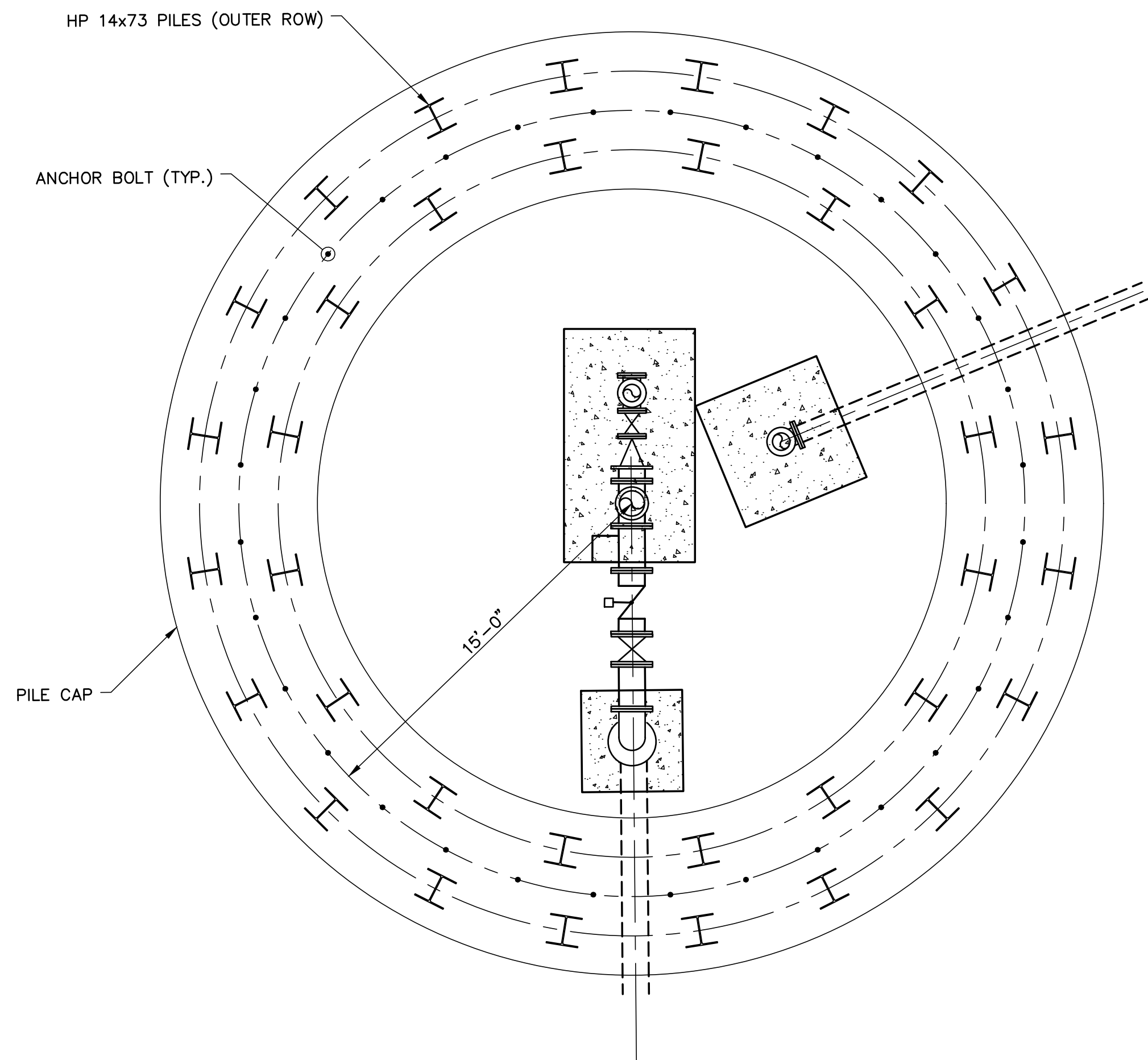
**NOTES:**

- SUBMIT TANK GRAPHIC RENDERING FOR APPROVAL PRIOR TO TANK PAINTER MOBILIZATION.
- OWNER RESERVES THE RIGHT TO MODIFY TEXT HEIGHT, LETTERING, OR LAYOUT AT NO ADDITIONAL COST.

SHEET NO.

14

SHEET 14 OF 24



**FOUNDATION PLAN**

SCALE: N.T.S.

**ESTIMATED ALLOWABLE SINGLE PILE LOAD CAPACITY**  
HP 14x73

PILE LENGTH (FT)	WILLOW WOOD		OZONE PINES	
	COMPRESSION (T)	TENSION (T)	COMPRESSION (T)	TENSION (T)
60	77	46	-	-
65	82	48	-	-
70	87	50	74	34
75	92	51	78	36
80	-	-	84	39
85	-	-	90	43
90	-	-	95	46
95	-	-	102	51

\*PILE LENGTHS MEASURED FROM THE EXISTING GROUND SURFACE.

SEE FULL GEOTECHNICAL REPORT, APPENDED TO SPECIFICATIONS

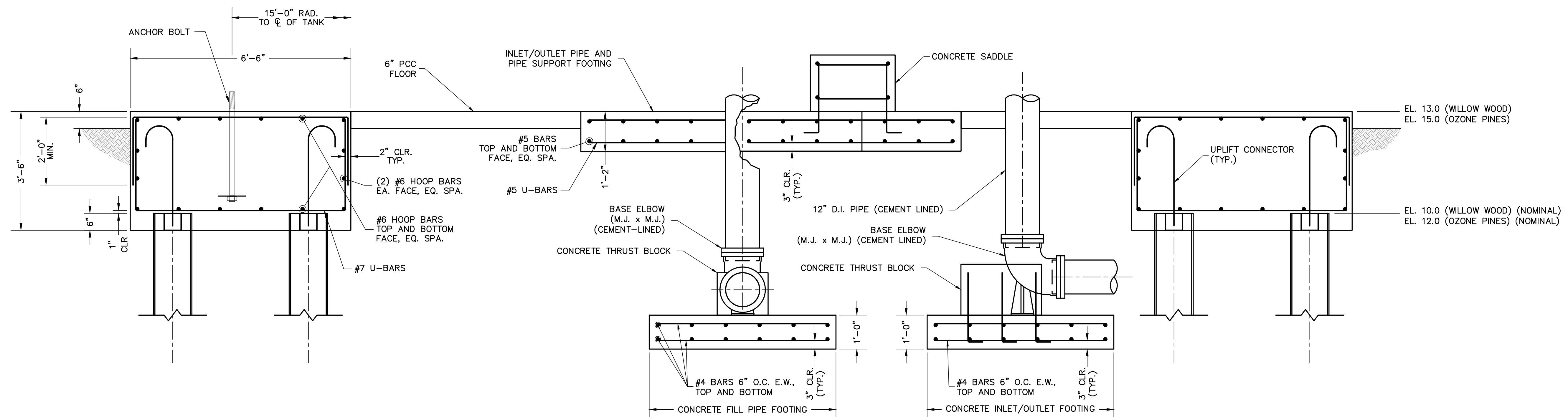
COMPRESSION FACTOR OF SAFETY=2.0  
TENSION FACTOR OF SAFETY=3.0

**SHALLOW SOIL BEARING CAPACITY (ALLOWABLE)**

	WILLOW WOOD	OZONE PINES
FIRM SUBGRADE	2,500 PSF	2,500 PSF
COMPACTED STRUCTURAL FILL	2,000 PSF	2,000 PSF

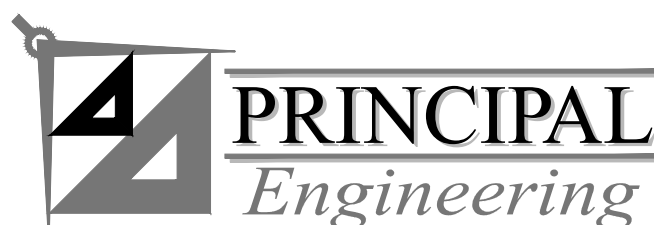
**NOTES:**

1. PROVIDE PILE-SUPPORTED REINFORCED CONCRETE FOUNDATION, CONSTRUCTED IN ACCORDANCE WITH SPECIFICATIONS, CONTRACT DRAWINGS, AND APPROVED SHOP DRAWINGS. FOUNDATION SHOWN IS NOMINAL, AND SHALL BE ADJUSTED BY CONTRACTOR AS REQUIRED OR ALLOWED BY THE DELEGATED DESIGN.
2. DELEGATED DESIGN: CONTRACTOR SHALL PROPORTION FOUNDATION TO RESIST REACTIONS CALCULATED DURING TANK DESIGN, USING THE CHARTED PILE AND SOIL CAPACITY, AND STATED FACTORS OF SAFETY. SUBMIT LEGIBLE, REVIEWABLE, COMPLETE CALCULATIONS AND DETAILED SHOP DRAWINGS FOR REVIEW AND APPROVAL BY A CIVIL OR STRUCTURAL ENGINEER. SUBMITTED DOCUMENTS SHALL BEAR THE SEAL OF A CIVIL OR STRUCTURAL ENGINEER LICENSED IN THE STATE OF LOUISIANA.
3. PILE CAPACITY SHALL BE VERIFIED BY PILE DYNAMIC ANALYZER (PDA) ON THE FIRST PRODUCTION PILE AT EACH SITE. CONTRACTOR SHALL PROCURE AND PAY COSTS FOR INSTRUMENTATION, MONITORING, ANALYSIS, AND REPORTING. REPORT SHALL BEAR THE SEAL OF AN ENGINEER LICENSED IN THE STATE OF LOUISIANA.
4. PILES SHALL BE DRIVEN TO PLAN TIP ELEVATION, OR GREATER. IF PREDICTED CAPACITY OF DRIVEN PILE FAILS TO REACH REQUIRED CAPACITY AT TIP ELEVATION, CONTRACTOR SHALL RE-TAP UP TO 7 DAYS AFTER INITIAL DRIVING AND REPORT CAPACITY, AT NO ADDITIONAL COST TO THE OWNER. IF ADDITIONAL PILE DEPTH IS ORDERED BY THE ENGINEER, CONTRACTOR SHALL SPLICE THE PILE AND COMMENCE DRIVING, INSTRUMENTED WITH PDA, UNTIL REQUIRED CAPACITY IS ACHIEVED. EQUITABLE ADJUSTMENT SHALL BE MADE IN PRICE FOR INCREASED DEPTH.
5. TOP 15 FT OF PILES SHALL BE COATED. SEE SPECIFICATIONS.



**TYPICAL FOUNDATION SECTION**

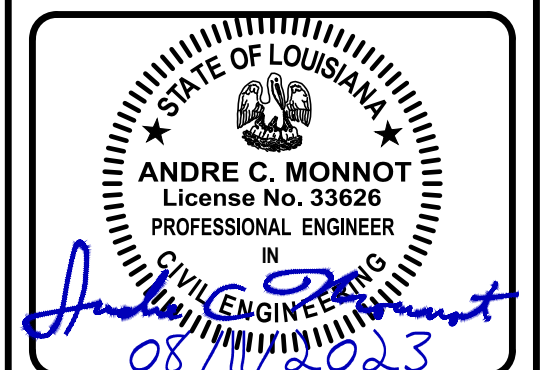
SCALE: N.T.S.



DEPT. OF UTILITIES  
ST. TAMMANY PARISH  
GOVERNMENT  
620 N. TYLER STREET  
COVINGTON, LA 70433

DATE:	DESCRIPTION OF REVISION	No.

DESIGNED BY: ACM	DRAWN BY: LMR	CHECKED BY: TMS	SUBMITTED BY: PRINCIPAL ENG	PROJECT No.: TU22000204	ISSUE DATE: AUG 2023	APPROVED BY:	SHEET SIZE: ANSI D	SCALE:
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CROSS GATES WATER SYSTEM  
NEW ELEVATED STORAGE TANK  
SLIDELL, LOUISIANA  
PROJECT No.: TU22000204  
FOUNDATION PLAN

SHEET NO.

15

SHEET 15 OF 24





DEPT. OF UTILITIES  
ST. TAMMANY PARISH  
GOVERNMENT  
620 N. TYLER STREET  
COVINGTON, LA 70433

**EQUIPMENT SCHEDULE (WELL & SITE) – WILLOW WOOD**

TAG NUMBER	NAME	TYPE	SPECIFICATION	LOCATION	MANUFACTURER / MODEL
AC-101-WW	AIR CONDITIONER	THROUGH-WALL CLASS 1, DIVISION 2	-	CHLORINE ROOM	FRIEDRICH SH15M30
AC-102-WW	AIR CONDITIONER	THROUGH-WALL CLASS 1, DIVISION 2	-	ELECTRICAL ROOM	FRIEDRICH SH15M30
AC-103-WW	EXPLOSION PROOF EXHAUST FAN	SHUTTER-MOUNT HAZARDOUS LOCATION	-	CHLORINE ROOM, WALL MOUNTED	CANARM AX12-4
ATS-101-WW	AUTOMATIC TRANSFER SWITCH	400A, 277/480V, 3 PHASE, 4W NEMA 3R ENCLOSURE	16415	ELECTRICAL ROOM, WALL MOUNTED	CUMMINS (SEE SPECIFICATION)
GE-101-WW	EMERGENCY GENERATOR	DIESEL FUEL, 277/480V, 3 PHASE 100 KW	16230	WILLOW WOOD SITE	CUMMINS (SEE SPECIFICATION)
PC-101-WW	LOCAL DRIVE CONTROLLER - CHEMICAL FEED PUMP	DIGITAL AC VFD NEMA 4X ENCLOSURE	11151	CHLORINE ROOM, SKID MOUNTED	JESCO K4 SERIES
PC-102-WW	LOCAL DRIVE CONTROLLER - CHEMICAL FEED PUMP	DIGITAL AC VFD NEMA 4X ENCLOSURE	11151	CHLORINE ROOM, SKID MOUNTED	JESCO K4 SERIES
HT-101-WW	DAY STORAGE TANK	DOUBLE WALL XLPE, 20 GALLON TANK	11151	CHLORINE ROOM	ASSMANN
HT-102-WW	BULK HYPO STORAGE TANK	XLPE, CONE BOTTOM INDUCTOR TANK 200 GALLON	11151	CHLORINE ROOM	ASSMANN
HT-103-WW	BULK HYPO STORAGE TANK	XLPE, CONE BOTTOM INDUCTOR TANK 200 GALLON	11151	CHLORINE ROOM	ASSMANN
CS-101-WW	CYLINDER SCALE	DUAL LOAD CELL	11281	CHLORINE ROOM	FORCE FLOW CHLOR-SCALE 150
CS-102-WW	CYLINDER SCALE	DUAL LOAD CELL	11281	CHLORINE ROOM	FORCE FLOW CHLOR-SCALE 150
GD-101-WW	CHLORINE GAS DETECTOR	ELECTROCHEMICAL SENSOR	11281	CHLORINE ROOM, WALL MOUNTED	CAPITAL CONTROLS 1610B
VR-101-WW	VACUUM REGULATOR	GAS FEED	11281	WALL MOUNTED	CAPITAL CONTROLS NXT3000
VR-102-WW	VACUUM REGULATOR	GAS FEED	11281	WALL MOUNTED	CAPITAL CONTROLS NXT3000
MA-101-WW	METER ASSEMBLY	GAS FEED	11281	VACUUM REGULATOR / WALL MOUNTED	CAPITAL CONTROLS NXT3000
CF-101-WW	CHEMICAL FEED PUMP	MOTOR-DRIVEN DIAPHRAGM	11151	CHLORINE ROOM, SKID MOUNTED	JESCO MEMDOS-LB4
CF-102-WW	CHEMICAL FEED PUMP	MOTOR-DRIVEN DIAPHRAGM	11151	CHLORINE ROOM, SKID MOUNTED	JESCO MEMDOS-LB4
BP-101-WW	CHLORINE BOOSTER PUMP	MULTI-STAGE IN-LINE	11107	ELECTRICAL ROOM, SHELF MOUNTED	GOULDS MODEL 10GBC10
CP-101-WW	CONTROL PANEL	NEMA 4X ENCLOSURE	16900	ELECTRICAL ROOM, WALL MOUNTED	SEE STANDARD DRAWING
CP-102-WW	BOOSTER PUMP PANEL	NEMA 4X ENCLOSURE	11107	CHLORINE ROOM, WALL MOUNTED	SEE SPECIFICATION
TS-101-WW	DAY TANK SCALE	SINGLE SHEAR BEAM LOAD CELL	11151	CHLORINE ROOM	FORCE-FLOW CHEM-SCALE #
TS-102-WW	BULK TANK SCALE	SINGLE SHEAR BEAM LOAD CELL	11151	CHLORINE ROOM	FORCE-FLOW CHEM-SCALE #
TS-103-WW	BULK TANK SCALE	SINGLE SHEAR BEAM LOAD CELL	11151	CHLORINE ROOM	FORCE-FLOW CHEM-SCALE #
EJ-101-WW	EJECTOR	VACUUM SOLUTION FEED	11281	PIPE MOUNTED	CAPITAL CONTROLS EJ200C
WM-101-WW	WELL MOTOR	VERTICAL HOLLOW SHAFT NEMA TYPE B	16150	WELL HEAD	U.S. MOTORS
WP-101-WW	WELL PUMP	LINESHAFT TURBINE PUMP	02525	WELL HEAD	GOULDS OR EQUAL
AM-101-WW	AMP METER	AC CURRENT TRANSDUCER, 1 PHASE, SPLIT CORE	-	ELECTRICAL ROOM, LPW	ACUAMP ACT050-42L-S
AM-102-WW	AMP METER	AC CURRENT TRANSDUCER, 1 PHASE, SPLIT CORE	-	ELECTRICAL ROOM, LPW	ACUAMP ACT050-42L-S
TT-101-WW	TEMPERATURE TRANSMITTER	-	-	CHLORINE ROOM	ROSEMOUNT 148 TEMPERATURE TRANSMITTER

**INSTRUMENT SCHEDULE (WELL & SITE) – WILLOW WOOD**

TAG NUMBER	FUNCTION	TYPE	RANGE	LOCATION	SPECIFICATION	MANUFACTURER / MODEL
CA-101-WW	CHLORINE ANALYZER (FREE)	AMPEROMETRIC	0 - 20 mg/L	CHLORINE ROOM, WALL MOUNTED	13423	HACH CLF10SC
CA-102-WW	CHLORINE ANALYZER (TOTAL)	AMPEROMETRIC	0 - 20 mg/L	CHLORINE ROOM, WALL MOUNTED	13423	HACH CLT10SC
AA-101-WW	AMMONIA ANALYZER	REAGENTS	0.1 - 10 mg/L	CHLORINE ROOM, WALL MOUNTED	13423	HACH 5500SC
AC-101-WW	ANALYZER CONTROLLER	-	-	CHLORINE ROOM, WALL MOUNTED	13423	HACH SC4500
DI-101-WW	SCALE DIGITAL INDICATOR (BULK TANKS)	SINGLE LOAD CELL	6 DIGITS	CHLORINE ROOM, WALL MOUNTED	11151	FORCE FLOW SOLO G2
DI-102-WW	SCALE DIGITAL INDICATOR (BULK TANKS)	SINGLE LOAD CELL	6 DIGITS	CHLORINE ROOM, WALL MOUNTED	11151	FORCE FLOW SOLO G2
DI-103-WW	SCALE DIGITAL INDICATOR (DAY TANK)	SINGLE LOAD CELL	6 DIGITS	CHLORINE ROOM, WALL MOUNTED	11151	FORCE FLOW SOLO G2
FM-101-WW	MAGMETER AND TRANSMITTER	FULL BORE	-2000 TO 2000	WELL HEAD	13400	ABB FEW325 SERIES WATERMASTER
PG-101-WW	PRESSURE GAUGE	DIAPHRAGM SEAL	0 - 150 PSI	WELL DISCHARGE	15183	ASHCROFT
PG-102-WW	PRESSURE GAUGE	DIAPHRAGM SEAL	0 - 200 PSI	CHLORINE ROOM, GASEOUS SOLUTION FEED	15183	ASHCROFT

**EQUIPMENT SCHEDULE (TANK) – WILLOW WOOD**

TAG NUMBER	NAME	TYPE	SPECIFICATION	LOCATION	MANUFACTURER / MODEL
MM-201-WW	MIXER MOTOR	NSF 61	15120	TANK BASE, FLOOR MOUNTED	BIG WAVE TWM 15020
MP-201-WW	MIXER CONTROL PANEL	NEMA 3R	15120	PEDESTAL BASE, WALL MOUNTED	BIG WAVE TWM 15020

**VALVE SCHEDULE (TANK) – WILLOW WOOD**

TAG NUMBER	SIZE (IN.)	TYPE	FUNCTION / LOCATION	SPECIFICATION	CONNECTION TYPE	MODEL / MANUFACTURER
GV-201-WW	8	GATE VALVE	TANK OVERFLOW	15110	FLANGED	MUELLER A-2361
GV-202-WW	10	GATE VALVE WITH VALVE BOX	DISTRIBUTION LINE	15110	RESTRAINED JOINT	MUELLER A-2361
ST-201-WW	1/2	SMOOTH SAMPLE TAP	TANK EFFLUENT	15110	1/2" NPT	SEE SPECIFICATION
ST-202-WW	1/2	SAMPLE STATION	WILLOW WOOD SITE	15110	1/2" NPT	MAIN GUARD 66WC

**INSTRUMENT SCHEDULE (TANK) – WILLOW WOOD**

TAG NUMBER	FUNCTION	TYPE	RANGE	LOCATION	SPECIFICATION	MANUFACTURER / MODEL
CA-201-WW	CHLORINE ANALYZER (FREE)	AMPEROMETRIC	0 - 20 mg/L	PEDESTAL BASE, TANK EFFLUENT LINE	13423	HACH CLF10SC
CA-202-WW	CHLORINE ANALYZER (TOTAL)	AMPEROMETRIC	0 - 20 mg/L	PEDESTAL BASE, TANK EFFLUENT LINE	13423	HACH CLT10SC
AA-201-WW	AMMONIA ANALYZER	REAGENTS	0.1 - 10 mg/L	PEDESTAL BASE, TANK EFFLUENT LINE	13423	HACH 5500SC
AC-201-WW	ANALYZER CONTROLLER	-	-	PEDESTAL BASE, TANK EFFLUENT LINE	13423	HACH SC4500
FM-201-WW	MAGMETER AND TRANSMITTER	FULL BORE	-2000 TO 2000	PEDESTAL BASE, TANK EFFLUENT LINE	13423	ABB FER325 SERIES WATERMASTER
PG-201-WW	PRESSURE GAUGE	DIAPHRAGM SEAL	0 - 100 PSI	PEDESTAL BASE, TANK EFFLUENT LINE	15183	ASHCROFT
PT-201-WW	PRESSURE TRANSMITTER	PRESSURE	0 - 100 PSI	PEDESTAL BASE, TANK EFFLUENT LINE	15183	ROSEMOUNT 2088
PT-202-WW	PRESSURE TRANSMITTER	PRESSURE	0 - 100 PSI	PEDESTAL BASE, TANK EFFLUENT LINE	15183	ROSEMOUNT 2088

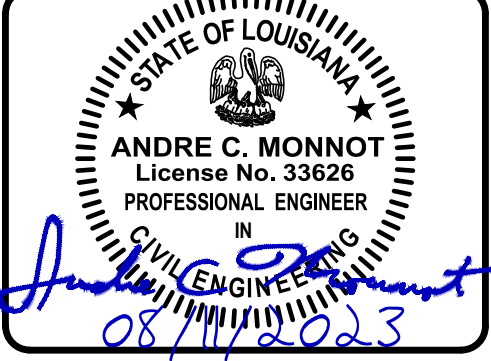
**VALVE SCHEDULE (WELL & SITE) – WILLOW WOOD**

TAG NUMBER	SIZE (IN.)	TYPE	FUNCTION / LOCATION	SPECIFICATION	CONNECTION TYPE	MODEL / MANUFACTURER
AR-101-WW	1	AIR / VACUUM	WELL HEAD - CASING	15110	NPT	VAL-MATIC
AR-102-WW	1	AIR RELEASE	WELL HEAD	15110	NPT	VAL-MATIC
BV-101-WW	3/4	BALL VALVES TYPE 22 TRUE UNION	CHEMICAL FEED	15110	SOLVENT WELDED SCH. 80 PVC	N/A
BV-102-WW	1	BALL VALVES TYPE 22 TRUE UNION	CHEMICAL FEED	15110	SOLVENT WELDED SCH. 80 PVC	N/A
BV-103-WW	1	BALL VALVES TYPE 22 TRUE UNION	CHEMICAL FEED	15110	SOLVENT WELDED SCH. 80 PVC	N/A
BV-104-WW	3/4	BALL VALVES TYPE 22 TRUE UNION	CHEMICAL FEED	15110	SOLVENT WELDED SCH. 80 PVC	N/A
BV-105-WW	1/2	BALL VALVES TYPE 22 TRUE UNION	CHEMICAL FEED	15110	SOLVENT WELDED SCH. 80 PVC	N/A
BV-106-WW	1/2	BALL VALVES TYPE 22 TRUE UNION	CHEMICAL FEED	15110	SOLVENT WELDED SCH. 80 PVC	N/A
BV-107-WW	1/2	BALL VALVES TYPE 22 TRUE UNION	CHEMICAL FEED	15110	SOLVENT WELDED SCH. 80 PVC	N/A
BV-##-WW (MULTIPLE)	1/2	BALL VALVES TYPE 22 TRUE UNION	CHEMICAL FEED	15110	SOLVENT WELDED SCH. 80 PVC	N/A
CV-101-WW	6	CHECK VALVE	WELL HEAD	15110	FLANGED	GA INDUSTRIES FIGURE 250
CV-102-WW	6	CHECK VALVE	WELL HEAD	15110	FLANGED	GA INDUSTRIES FIGURE 250
CV-103-WW	1	CHECK VALVE	CHEMICAL FEED	15110	SOLVENT WELDED SCH. 80 PVC	N/A
GV-101-WW	10	GATE VALVE	BYPASS BRANCH	15110	FLANGED	MUELLER A-2361
GV-102-WW	6	GATE VALVE	WELL HEAD	15110	FLANGED	MUELLER A-2361
GV-103-WW	10	GATE VALVE	WELL HEAD	15110	FLANGED	MUELLER A-2361
GV-104-WW	10	GATE VALVE	WELL HEAD	15110	FLANGED	MUELLER A-2361
ST-101-WW	1/2	SMOOTH SAMPLE TAP	WELL HEAD	15110	1/2" NPT	SEE SPECIFICATION
ST-102-WW	1/2	SMOOTH SAMPLE TAP	WELL HEAD	15110	1/2" NPT	SEE SPECIFICATION

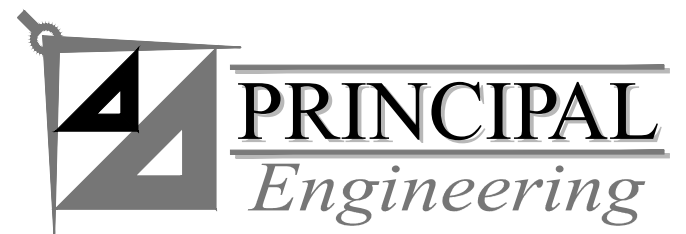
BY WELL CONTRACTOR.  
NOT IN CONTRACT

DATE:									
DESCRIPTION OF REVISION									
No.									

DESIGNED BY: JCM	CHECKED BY: LMR	DATE: AUG 2023
DRAWN BY: TMS	APPROVED BY: ANS D	SCALE:
SUBMITTED BY: PRINCIPAL ENG	PROJECT No.: TU22000204	
ISSUE DATE: AUG 2023	ISSUE No.: TU22000209	



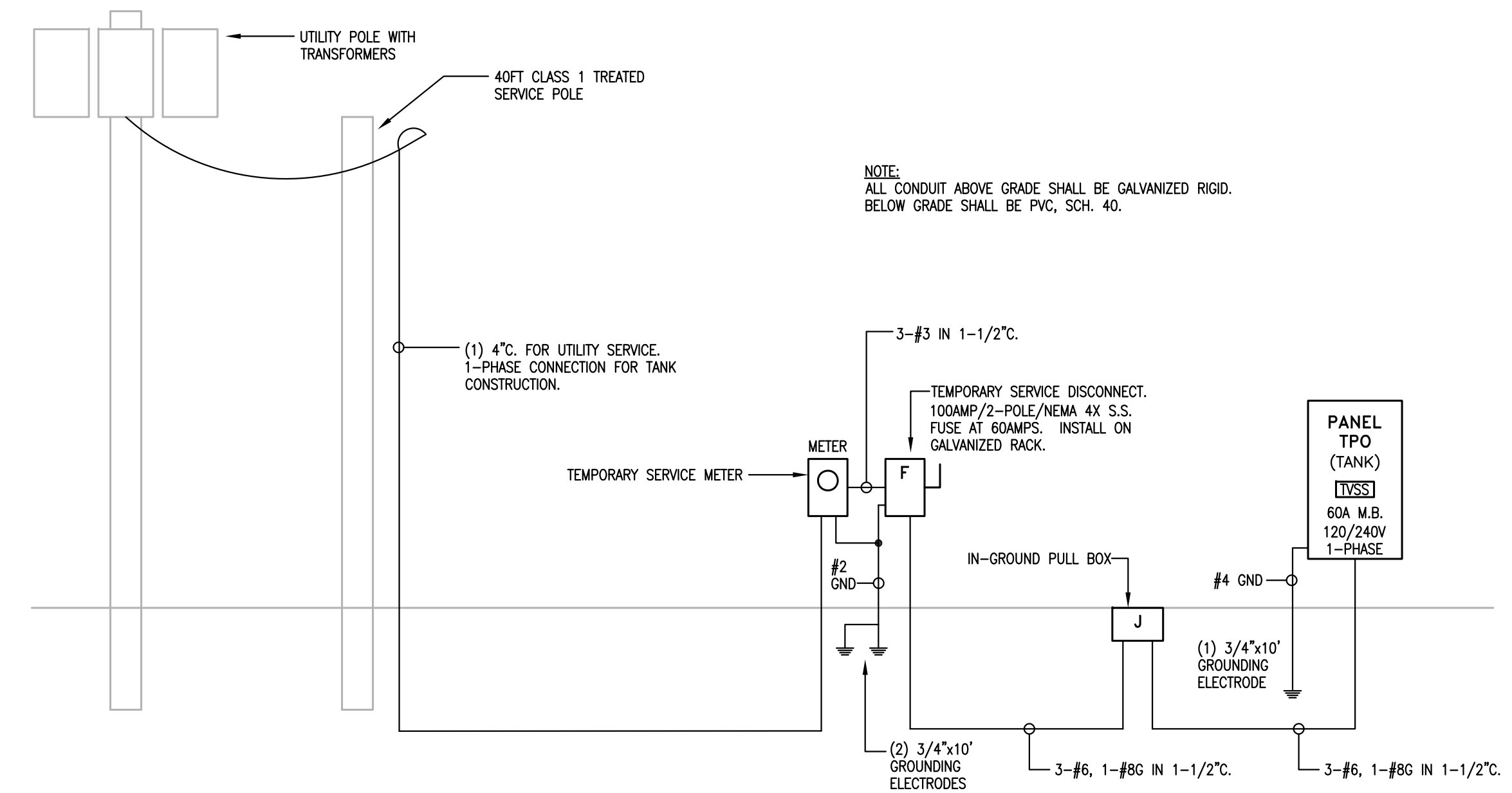
CROSS GATES WATER SYSTEM  
NEW ELEVATED STORAGE TANK  
SLIDELL, LOUISIANA  
PROJECT No.: TU22000204  
TU22000209  
PROCESS SCHEMATIC  
AND SCHEDULES







ELECTRICAL LEGEND	
<b>LIGHTING</b>	
○	WALL MOUNTED FIXTURE
<b>SWITCHES</b>	
⌘	SINGLE POLE SWITCH - 20A, 120/277V, +48" AFF, UNLESS NOTED
<b>SWITCHGEAR</b>	
○	JUNCTION BOX
□	NON FUSED SAFETY SWITCH NEMA 4X S.S. AT WET LOCATIONS
⌘	FUSED SAFETY SWITCH NEMA 4X S.S. AT WET LOCATIONS
■	LIGHT AND POWER PANELBOARD
T	TRANSFORMER
M	METER
⊕	SPECIAL ELECTRICAL CONNECTION
<b>CONDUIT AND WIRE</b>	
~	FLEXIBLE CONDUIT, SEALTITE AT WET LOCATIONS
—	CONDUIT CONCEALED IN WALL OR ABOVE CEILING
- - -	CONDUIT BELOW FLOOR OR CONCEALED IN WALL
—	CONDUIT EXPOSED
— — —	CIRCUIT CONDUCTORS IN CONDUIT
— — — — —	MULTIPLE CIRCUIT CONDUCTORS IN CONDUIT WITH NEUTRALS
— — — — —	GROUND CONDUCTORS IN CONDUIT
○	CONDUIT UP
○	CONDUIT DOWN
XX-XX	CIRCUIT HOMERUN TO PANEL BOARD. XX-XX DENOTES PANEL NAME AND CIRCUIT NUMBER
—	CONTINUATION OF CONDUIT RUN
<b>DEVICES</b>	
⊕WR	GFI, WEATHER RESISTANT DUPLEX RECEPTACLE - 20A, 120V WITH IN-USE WEATHERPROOF COVER
MOUNT ALL DEVICES AT +18" AFF, UNLESS NOTED OTHERWISE.	



1 ELECTRICAL RISER DIAGRAM - OZONE PINES  
E1 SCALE: NOT TO SCALE

LUMINAIRE SCHEDULE						
MARK	LAMPS	MOUNTING	DESCRIPTION	MANUFACTURER	EQUALS	
D	LED-A19	WALL; VERIFY	LED, WALL MOUNT VAPORITITE	LITHONIA VM150I-M12	OR APPROVED EQUAL	
OL	(2) LED	SURFACE STRUCTURE	DOUBLE LED, OBSTRUCTION LIGHT, W/ PHOTOCEL	FLIGHTLIGHT FL-810LNV-R-AC-D-34B-P	OR APPROVED EQUAL	
WIE	LED	WALL; VERIFY	LED, EXTERIOR WALL PACK, W/ EMERGENCY, W/ PHOTOCCELL	LITHONIA WDG3 LED-P3-40K-80CRI-RFT-MVOLT-SRM-PBBW-E20WC-PE-DBLXD	OR APPROVED EQUAL	

NOTE: LUMINAIRES WITH "E" DESIGNATION SHALL HAVE INTEGRAL EMERGENCY BALLAST. CONNECT EMERGENCY BALLAST ONLY AHEAD OF ANY SWITCHING. NORMAL BALLAST TO BE SWITCHED AS INDICATED, UNLESS NOTED OTHERWISE.

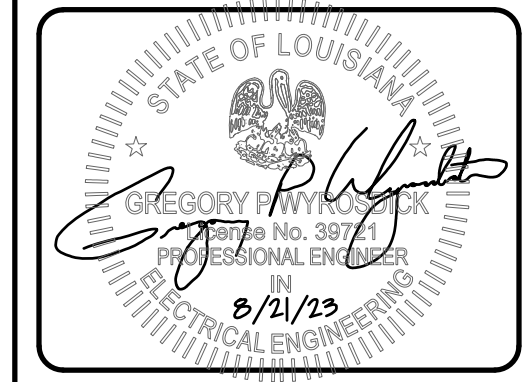
PANEL	BUSS: 100 AMP	VOLT: 120/240V, 1 PHASE, 3 WIRE	AIC RATING: 10,000						
			TPO		MOUNT: SURFACE, NEMA 1				
MAINS: 60A M.B.		LOCATION: WATER TANK (OZONE PINES)							
CKT.	BKR.	DESCRIPTION	FEEDER	LOAD (AMPS)	FEEDER	DESCRIPTION	BKR.	CKT.	
				A	C				
1	20/1	LIGHTS (WATER TANK)	2-12, 1-12G	1.5		2-12, 1-12G	REC. (WATER TANK)	20/1	2
3	20/1	LIGHTS (WATER TANK TOWER)	2-12, 1-12G		3	2-12, 1-12G	REC. (PLATFORM)	20/1	4
5	20/1	LIGHTS (WATER TANK TOWER)	2-12, 1-12G	3		2-12, 1-12G	CHLORINE ANALYZER (TANK)	20/1	6
7	20/1	LIGHTS (EXTERIOR)	2-12, 1-12G		1.5	2-12, 1-12G	FLOW METER (TANK)	20/1	8
9	20/2	TANK MIXER (WATER TANK)	2-10, 1-10G	10		2-12, 1-12G	PRESSURE TRANSMIT (TANK)	20/1	10
11					10	2-12, 1-12G	PRESSURE TRANSMIT (TANK)	20/1	12
13	20/1	SPARE							14
15	20/1	SPARE							16
17	20/1	SPARE							18
19	20/1	SPARE							20
21	20/1	SPARE							22
23	20/1	SPARE							24
				14.5	14.5	13.5	13.5		
NOTES: 1. PROVIDE TVSS							CONNECTED LOADS PER PHASE		
							A phase	28.0	amps
							C phase	28.0	amps



DEPT. OF UTILITIES  
ST. TAMMANY PARISH  
GOVERNMENT  
620 N. TYLER STREET  
COVINGTON, LA 70433

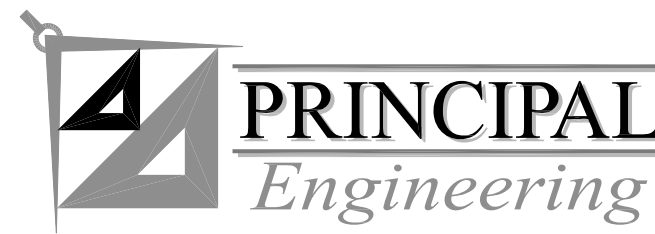
DATE	DESCRIPTION OF REVISION	No.

DESIGNED BY: JWH	CHECKED BY: GPW	PROJECT No.: TU22000204	ISSUE DATE: AUG. 2023	SHEET SIZE: ANS I	SCALE: AS SHOWN
DRAWN BY: JWH	SUBMITTED BY: PRINCIPAL ENG.	TU22000204	AUG. 2023	ANS I	AS SHOWN



CROSS GATES WATER SYSTEM  
NEW ELEVATED STORAGE TANK  
SLIDELL, LOUISIANA  
PROJECT No.: TU22000204  
TU22000209  
ELECTRICAL RISER DIAGRAM  
OZONE PINES

SHEET NO.  
E1  
SHEET 19 OF 24

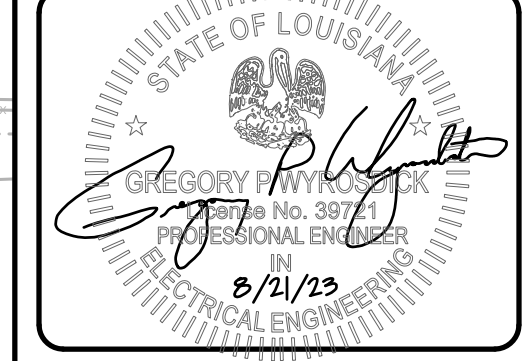




DEPT. OF UTILITIES  
ST. TAMMANY PARISH  
GOVERNMENT  
620 N. TYLER STREET  
COVINGTON, LA 70433

DATE:	DESCRIPTION OF REVISION

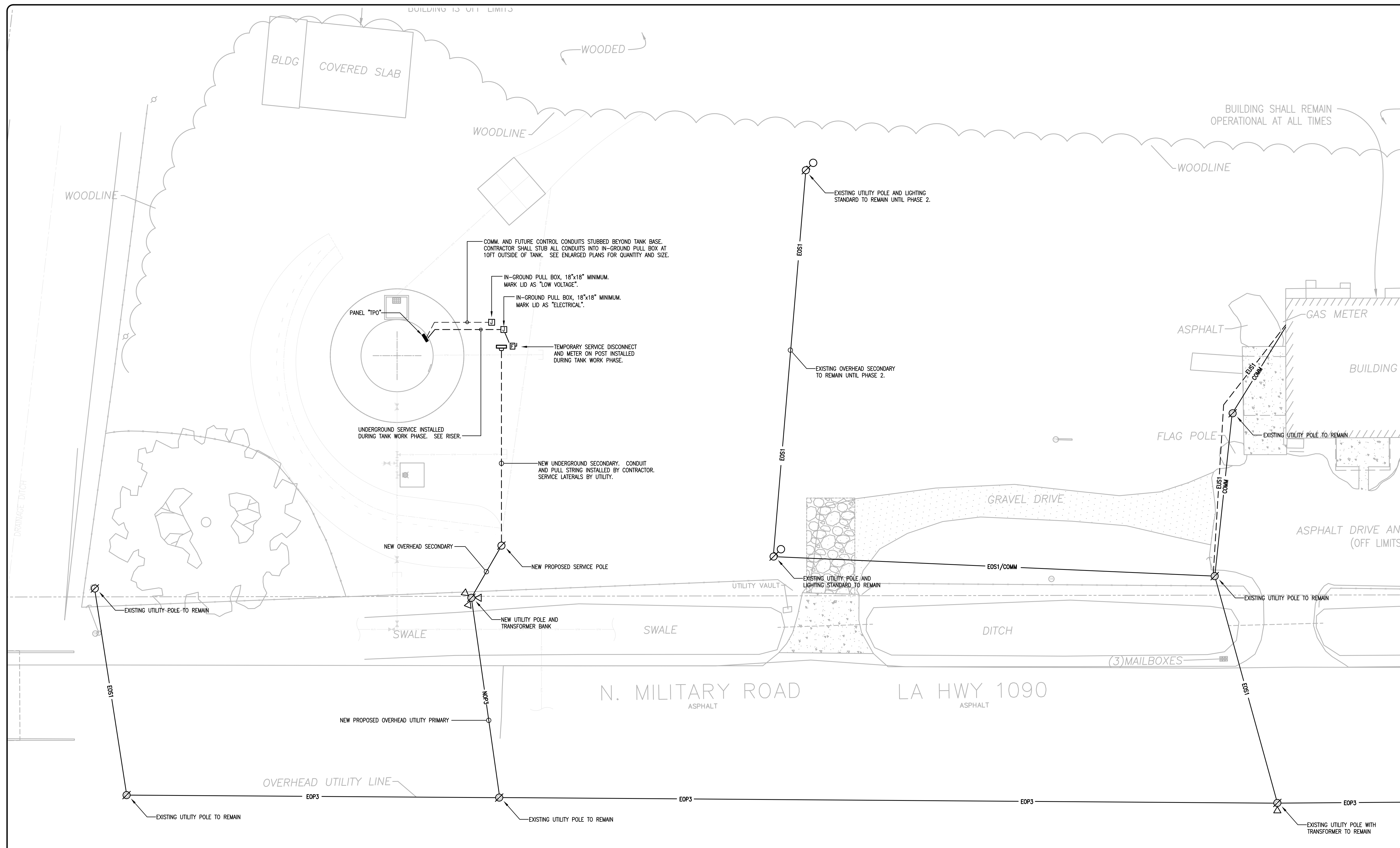
DESIGNED BY:	JWH	ANSI D
DRAWN BY:	JWH	AS SHOWN
CHECKED BY:	GPW	
SUBMITTED BY:	PRINCIPAL ENG.	
PROJECT No.:	TU22000204	
ISSUE DATE:	AUG. 2023	
APPROVED BY:		
SHEET SIZE:		
SCALE:		



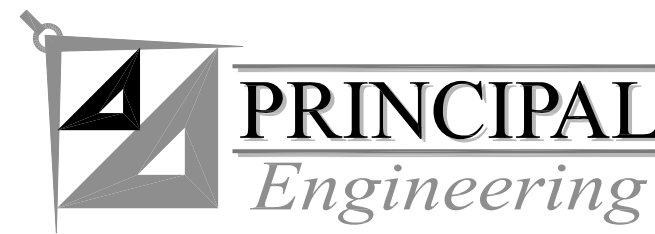
CROSS GATES WATER SYSTEM  
NEW ELEVATED STORAGE TANK  
SLIDELL, LOUISIANA  
PROJECT No.: TU22000204  
TU22000209

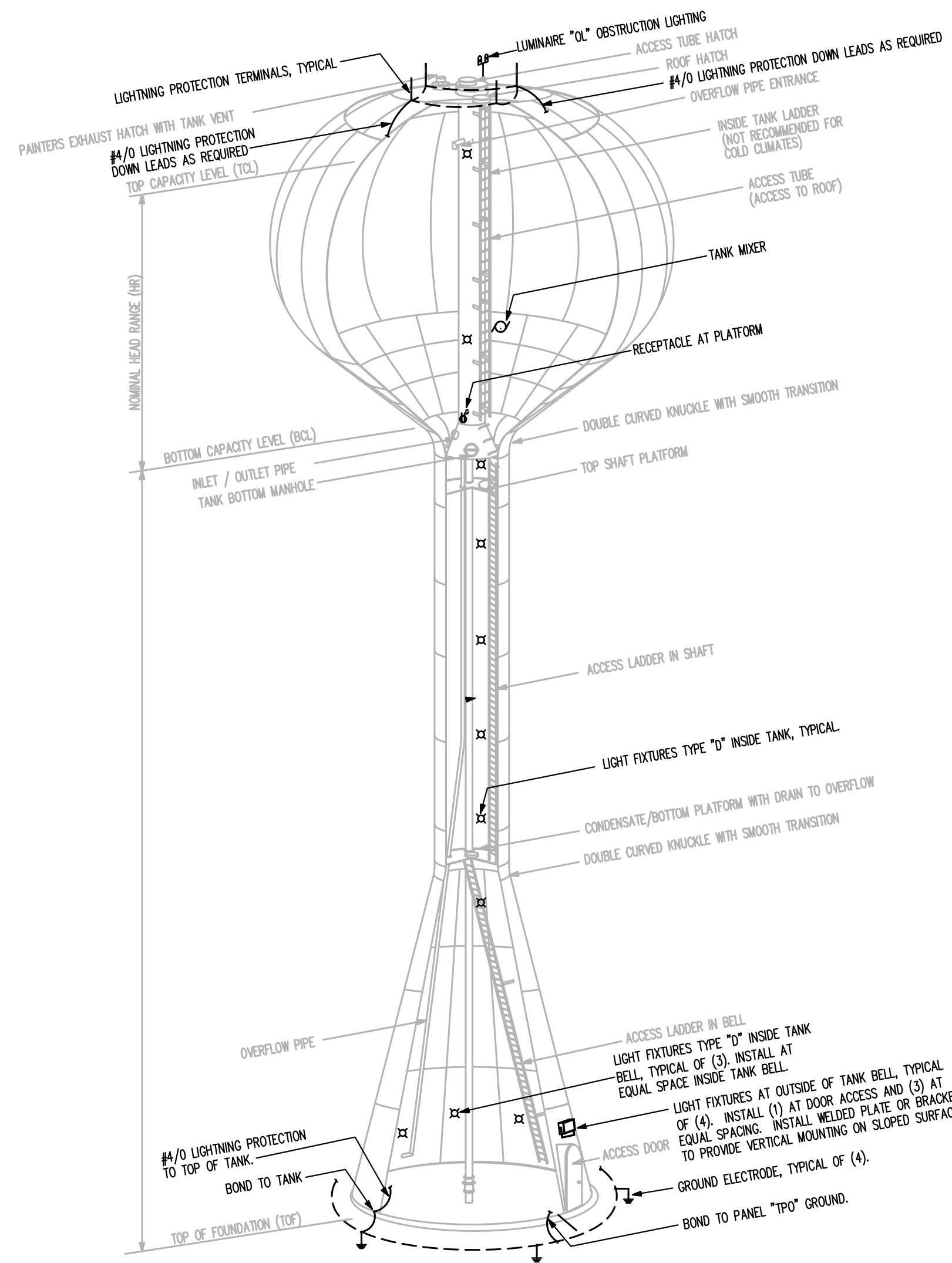
ELECTRICAL SITE PLAN  
OZONE PINES

SHEET NO.  
**E2**  
SHEET 20 OF 24

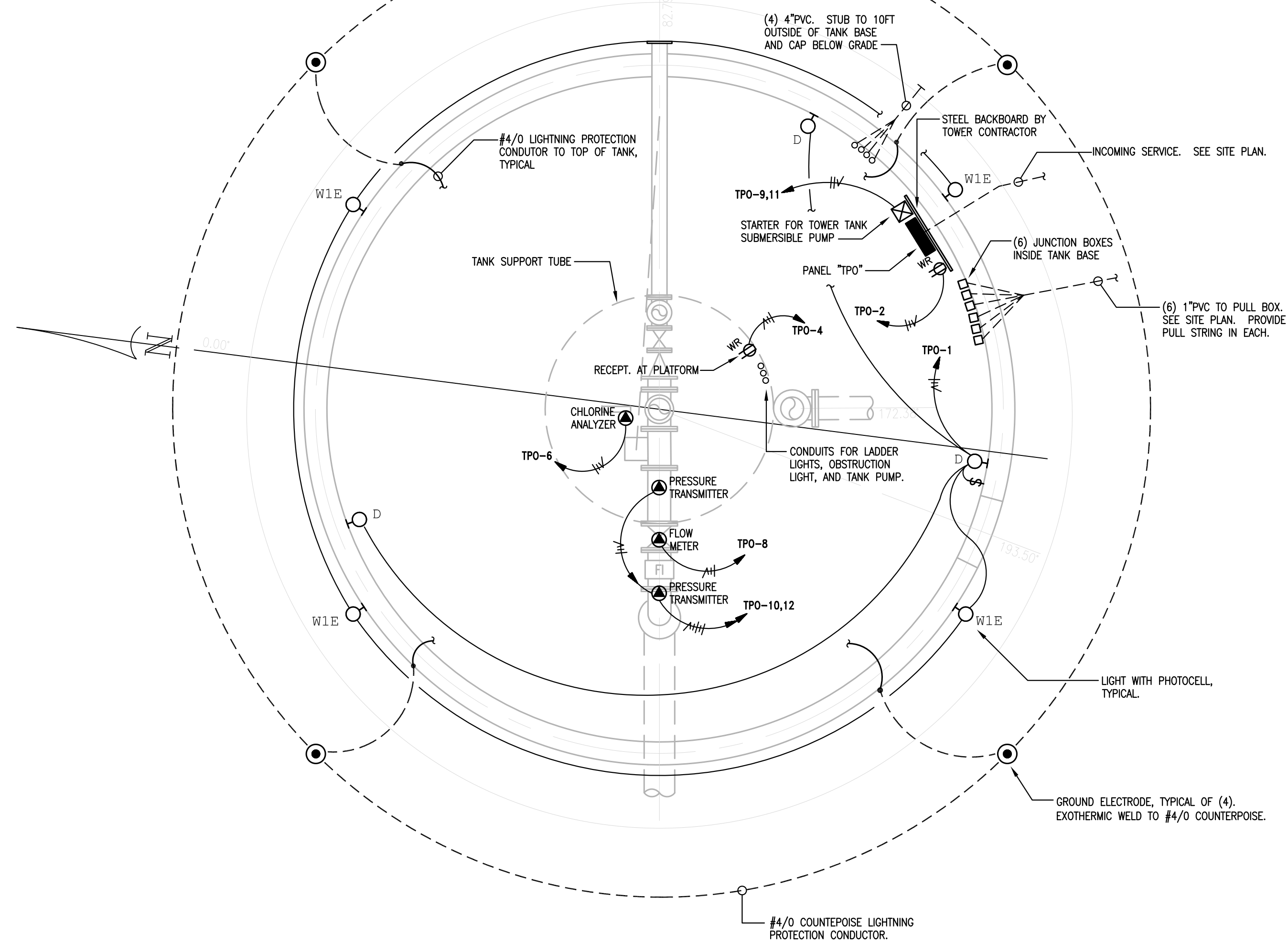


1 ELECTRICAL SITE PLAN - OZONE PINES  
E2 SCALE: 1" = 20'-0"

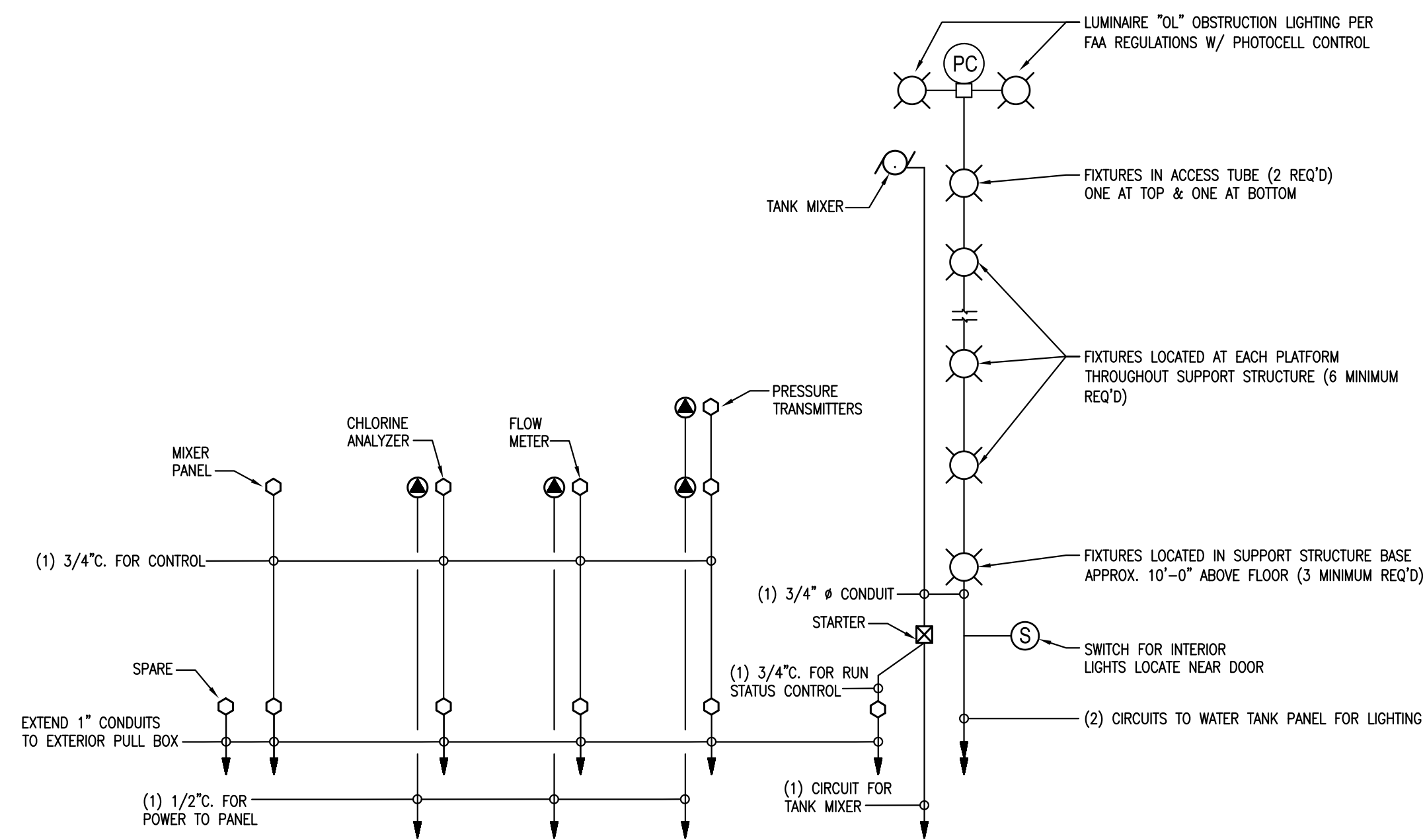




1 ENLARGED ELECTRICAL ELEVATION - ELEVATED TANK  
E3 SCALE: NOT TO SCALE



2 ENLARGED ELECTRICAL PLAN - OZONE PINES (ELEVATED TANK)  
E3 SCALE: 1/4" = 1'-0"



3 ONE LINE DIAGRAM - ELEVATED TANK LIGHTS  
E3 SCALE: 1/4" = 1'-0"

ELECTRICAL NOTES:

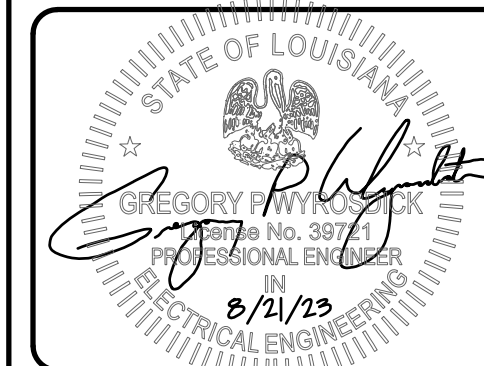
1. ALL CONDUITS GALV. RIGID.
2. ALL BRANCH CIRCUIT WIRING 12 GA THIN, UNLESS NOTED OTHERWISE.
3. ALL RECEPTACLE CIRCUITS TO BE GROUND FAULT-INTERRUPT PROTECTED.
4. ALL POWER WIRING TO BE INSTALLED IN 1/2" MIN. # CONDUITS.
5. ALL CONTROL WIRING TO BE INSTALLED IN 3/4" MIN. # CONDUITS.
6. MOUNT LIGHTING SWITCHES INSIDE NEAR DOOR.
7. LABEL BRANCH BREAKERS IN PANELBOARD PER WIRING SCHEMATIC.
8. LABEL LIGHTING SWITCHES PER WIRING SCHEMATIC.
9. ALL INTERIOR LIGHT FIXTURES TO BE LED WEATHER PROOF..
10. PROVIDE OBSTRUCTION LIGHTING WITH PHOTOCELL CONTROLS PER FAA REGULATIONS
11. INSTALL ALL CONDUITS FOR POWER AND CONTROL IN SLAB OR OVERHEAD IN BASE OF TANK. CONDUITS SHALL FOLLOW STRUCTURAL MEMBERS WHERE OVERHEAD.
12. INSTALL PULL STRINGS IN ALL EMPTY CONDUIT.



DEPT. OF UTILITIES  
ST. TAMMANY PARISH  
GOVERNMENT  
620 N. TYLER STREET  
COVINGTON, LA 70433

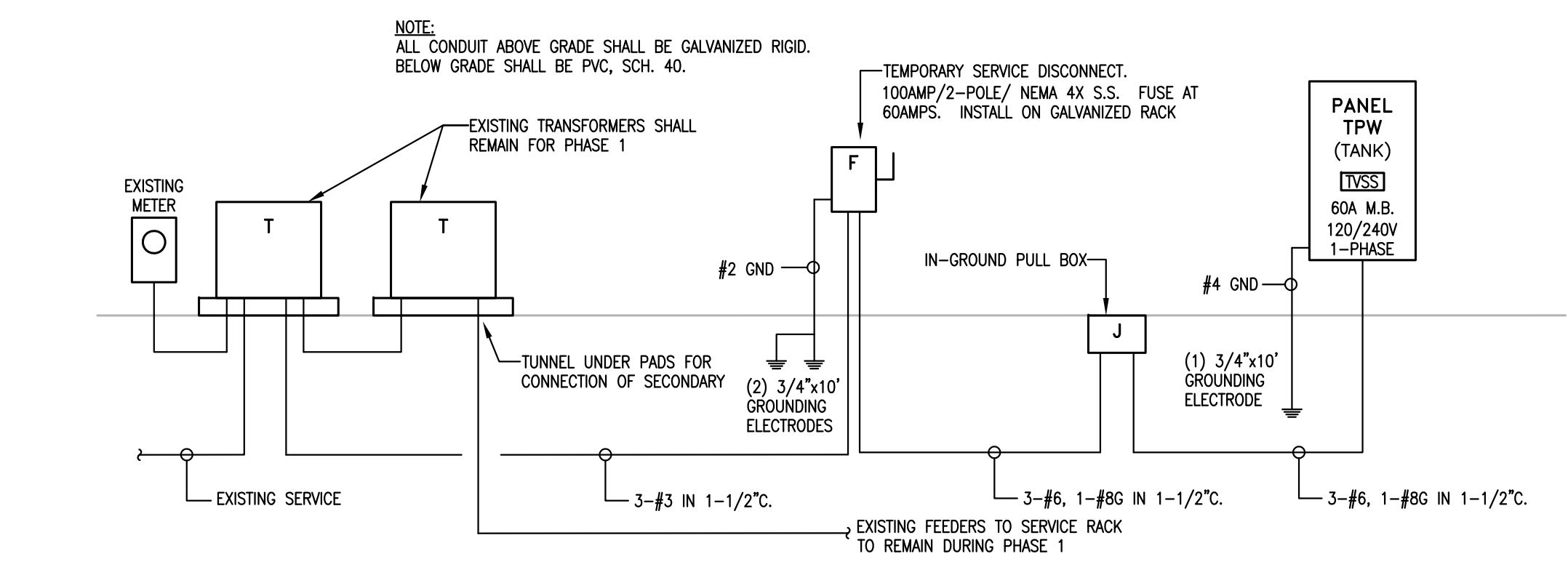
DATE:	DESCRIPTION OF REVISION	No.

DESIGNED BY:	JWH
DRAWN BY:	JWH
CHECKED BY:	GPW
SUBMITTED BY:	PRINCIPAL ENG.
PROJECT No.:	TU22000204
ISSUE DATE:	AUG. 2023
APPROVED BY:	ANSID
SHEET SIZE:	AS SHOWN
SCALE:	AS SHOWN



CROSS GATES WATER SYSTEM  
NEW ELEVATED STORAGE TANK  
SLIDELL, LOUISIANA  
PROJECT No.: TU22000204  
TU22000209  
ENLARGED ELECTRICAL PLANS  
OZONE PINES

ELECTRICAL LEGEND	
<b>LIGHTING</b>	<b>CONDUIT AND WIRE</b>
○ WALL MOUNTED FIXTURE	~ FLEXIBLE CONDUIT, SEALTITE AT WET LOCATIONS
<b>SWITCHES</b>	— CONDUIT CONCEALED IN WALL OR ABOVE CEILING
§ SINGLE POLE SWITCH – 20A, 120/277V, +48" AFF, UNLESS NOTED	- - CONDUIT BELOW FLOOR OR CONCEALED IN WALL
<b>SWITCHGEAR</b>	— CONDUIT EXPOSED
○ JUNCTION BOX	— CIRCUIT CONDUCTORS IN CONDUIT
□ NON FUSED SAFETY SWITCH NEMA 4X S.S. AT WET LOCATIONS	— MULTIPLE CIRCUIT CONDUCTORS IN CONDUIT WITH NEUTRALS
□ FUSED SAFETY SWITCH NEMA 4X S.S. AT WET LOCATIONS	— GROUND CONDUCTORS IN CONDUIT
— LIGHT AND POWER PANELBOARD	— CONDUIT UP
□ TRANSFORMER	— CONDUIT DOWN
□ METER	— CIRCUIT HOMERUN TO PANEL BOARD. XX-XX DENOTES PANEL NAME AND CIRCUIT NUMBER
○ SPECIAL ELECTRICAL CONNECTION	— CONTINUATION OF CONDUIT RUN
	<b>DEVICES</b>
	Ⓜ GF, WEATHER RESISTANT DUPLEX RECEPTACLE – 20A, 120V WITH IN-USE WEATHERPROOF COVER
	MOUNT ALL DEVICES AT +18" AFF, UNLESS NOTED OTHERWISE.



1 ELECTRICAL RISER DIAGRAM – WILLOW WOOD  
 E4 SCALE: NOT TO SCALE

LUMINAIRE SCHEDULE					
MARK	LAMPS	MOUNTING	DESCRIPTION	MANUFACTURER	EQUALS
D	LED-A19	WALL; VERIFY	LED, WALL MOUNT VAPORTITE	LITHONIA VW150HM12	OR APPROVED EQUAL
OL	(2) LED	SURFACE STRUCTURE	DOUBLE LED, OBSTRUCTION LIGHT, W/ PHOTOCEL	FLIGHTLIGHT FL-810LNV-R-AC-D-34B-P	OR APPROVED EQUAL
WLE	LED	WALL; VERIFY	LED, EXTERIOR WALL PACK, W/ EMERGENCY, W/ PHOTOCELL	LITHONIA WDGE3 LED-P3-40K-80CRI-RFT-MVOLT-SRM-PBBW-E20WC-PE-DBLXD	OR APPROVED EQUAL

NOTE: LUMINAIRES WITH "E" DESIGNATION SHALL HAVE INTEGRAL EMERGENCY BALLAST. CONNECT EMERGENCY BALLAST ONLY AHEAD OF ANY SWITCHING. NORMAL BALLAST TO BE SWITCHED AS INDICATED, UNLESS NOTED OTHERWISE.

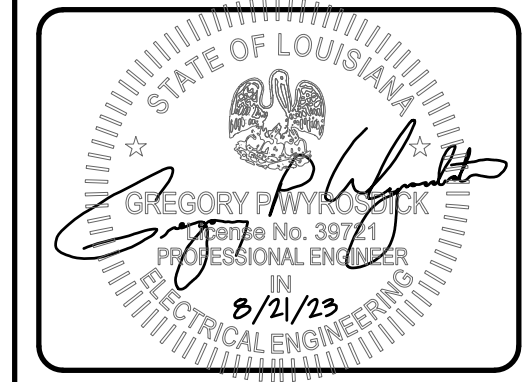
CKT.	BKR.	DESCRIPTION	FEEDER	LOAD (AMPS)		FEEDER	DESCRIPTION	BKR.	CKT.	
				A	C					
				CONNECTED LOADS PER PHASE						
1	20/1	LIGHTS (WATER TANK)	2-12, 1-12G	1.5		2-12, 1-12G	REC. (WATER TANK)	20/1	2	
3	20/1	LIGHTS (WATER TANK TOWER)	2-12, 1-12G		3	2-12, 1-12G	REC. (PLATFORM)	20/1	4	
5	20/1	LIGHTS (WATER TANK TOWER)	2-12, 1-12G	3		2-12, 1-12G	CHLORINE ANALYZER (TANK)	20/1	6	
7	20/1	LIGHTS (EXTERIOR)	2-12, 1-12G		1.5	2-12, 1-12G	FLOW METER (TANK)	20/1	8	
9				10		2-12, 1-12G	PRESSURE TRANSMIT (TANK)	20/1	10	
11	20/2	TANK MIXER (WATER TANK)	2-10, 1-10G			2-12, 1-12G	PRESSURE TRANSMIT (TANK)	20/1	12	
13	20/1	SPARE							14	
15	20/1	SPARE							16	
17	20/1	SPARE							18	
19	20/1	SPARE							20	
21	20/1	SPARE							22	
23	20/1	SPARE							24	
				14.5	14.5	13.5	13.5			
NOTES: 1. PROVIDE TVSS				CONNECTED LOADS PER PHASE		A phase	28.0	amps		
						C phase	28.0	amps		



DEPT. OF UTILITIES  
 ST. TAMMANY PARISH  
 GOVERNMENT  
 620 N. TYLER STREET  
 COVINGTON, LA 70433

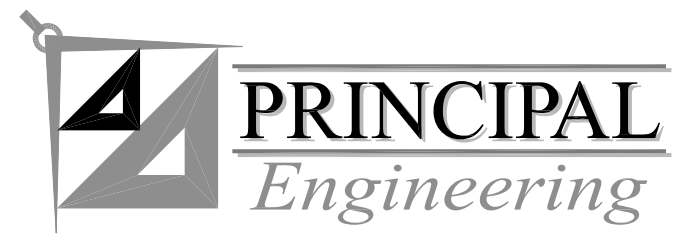
DATE:	DESCRIPTION OF REVISION	No.

DESIGNED BY: JWH	CHECKED BY: JWH	DRAWN BY: JWH	ISSUE DATE: AUG. 2023	ANSI D	AS SHOWN
SUBMITTED BY: GPW	PROJECT No.: TU22000204	APPROVED BY: TU22000209	SHEET SIZE:		
PRINCIPAL ENG.:			SCALE:		



CROSS GATES WATER SYSTEM  
 NEW ELEVATED STORAGE TANK  
 SLIDELL, LOUISIANA  
 PROJECT No.: TU22000204  
 TU22000209  
 ELECTRICAL RISER DIAGRAM  
 WILLOW WOOD

SHEET NO.  
 E4  
 SHEET 22 OF 24

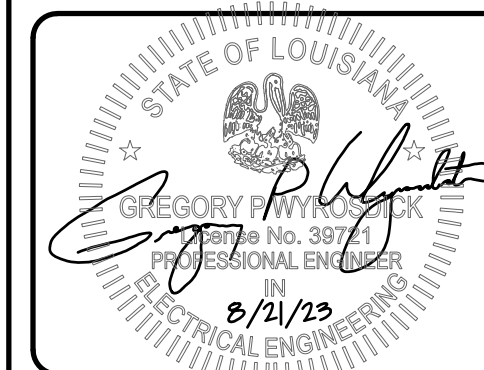




DEPT. OF UTILITIES  
ST. TAMMANY PARISH  
GOVERNMENT  
620 N. TYLER STREET  
COVINGTON, LA 70433

DATE	DESCRIPTION OF REVISION	No.

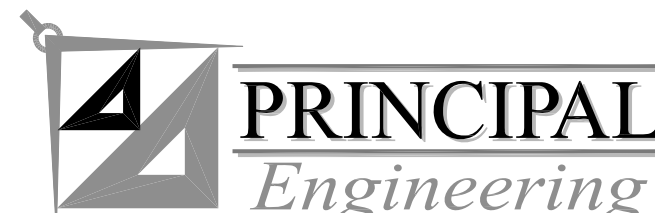
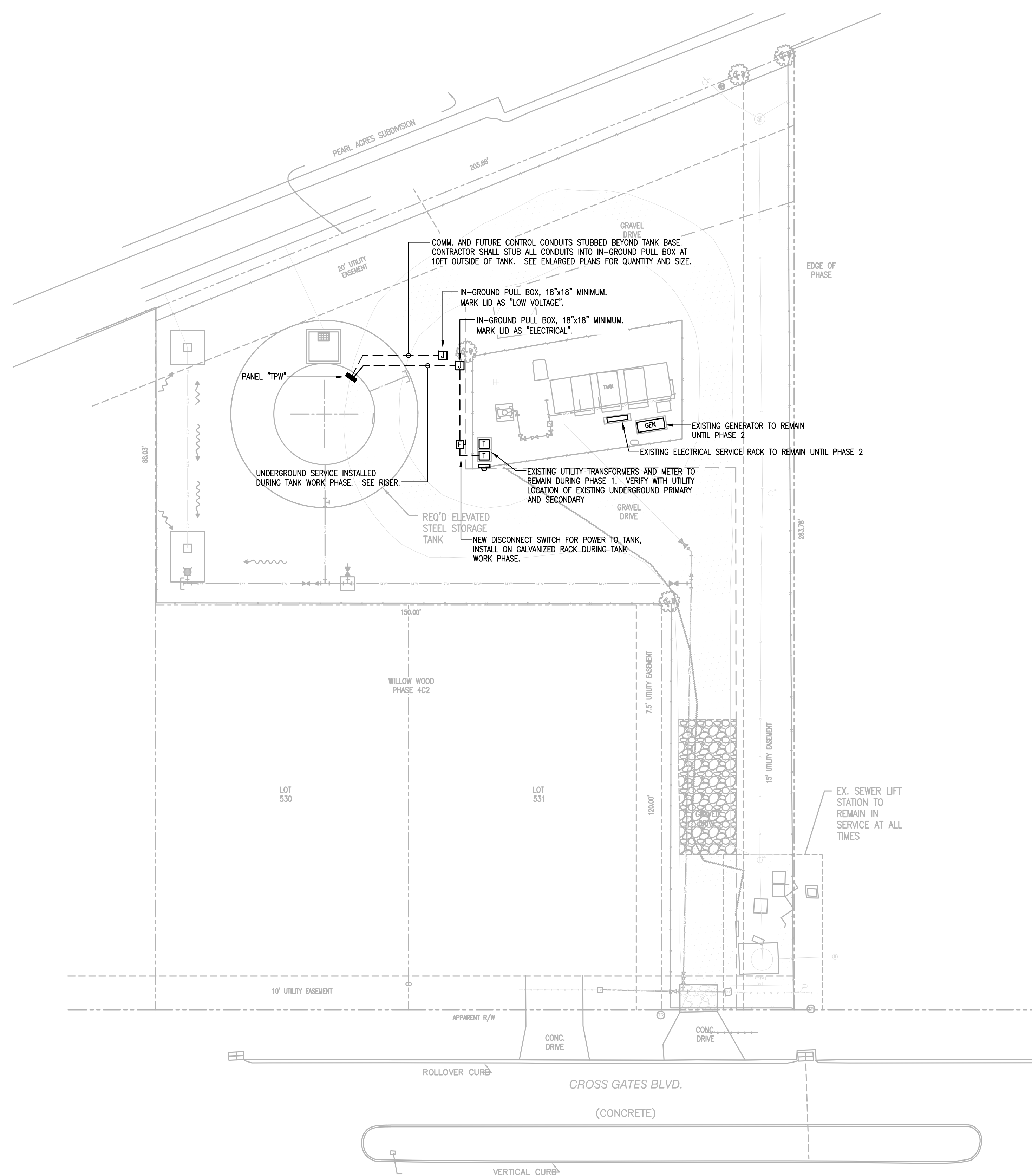
DESIGNED BY:	JWH
DRAWN BY:	JWH
CHECKED BY:	GPW
SUBMITTED BY:	PRINCIPAL ENG.
PROJECT No.:	TU22000204
ISSUE DATE:	TU22000209
APPROVED BY:	AUG. 2023
SHEET SIZE:	ANSI D
SCALE:	AS SHOWN



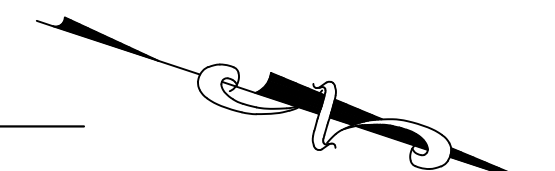
CROSS GATES WATER SYSTEM  
NEW ELEVATED STORAGE TANK  
SLIDELL, LOUISIANA  
PROJECT No.: TU22000204  
TU22000209

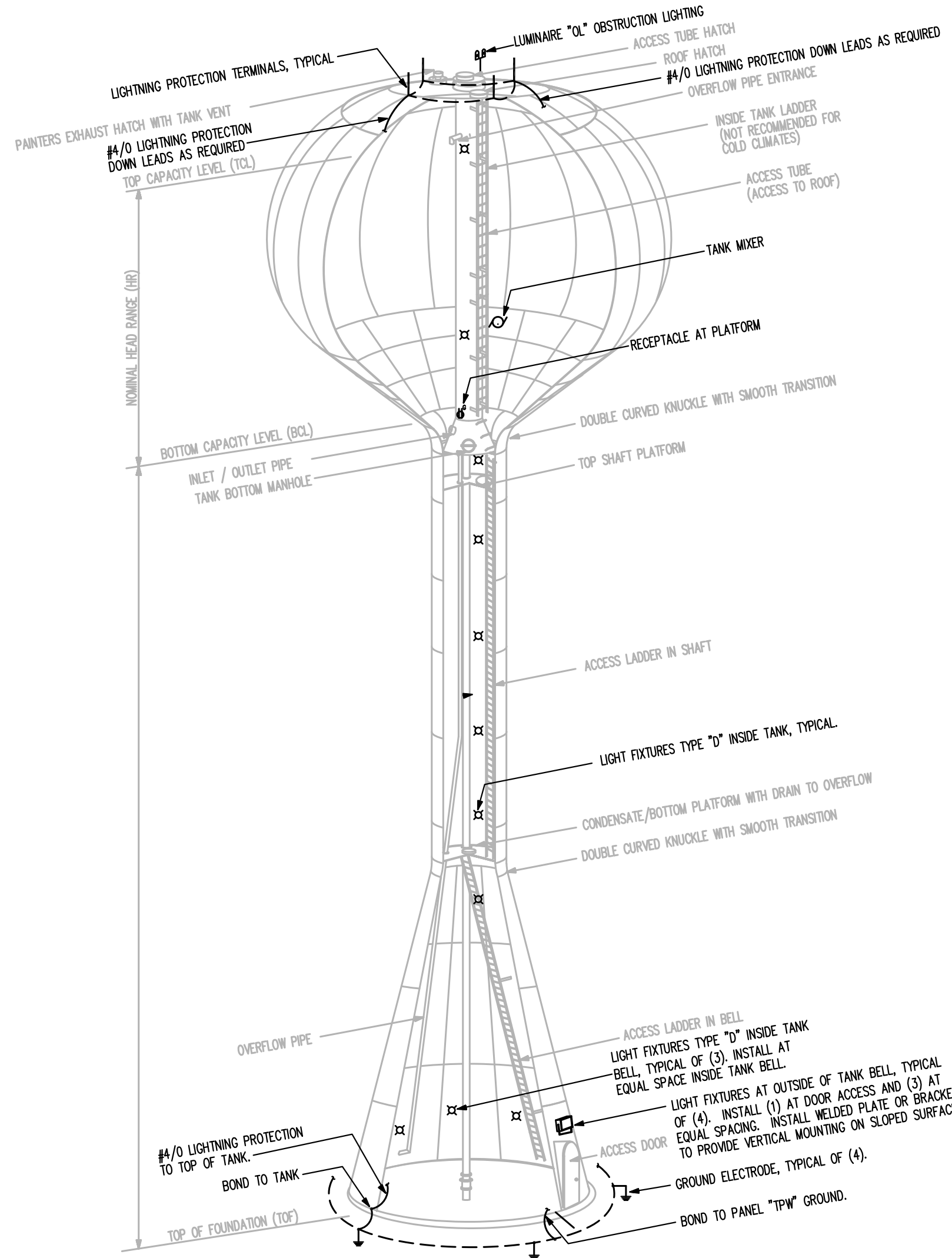
ELECTRICAL SITE PLAN  
WILLOW WOOD

SHEET NO.  
**E5**  
SHEET 23 OF 24

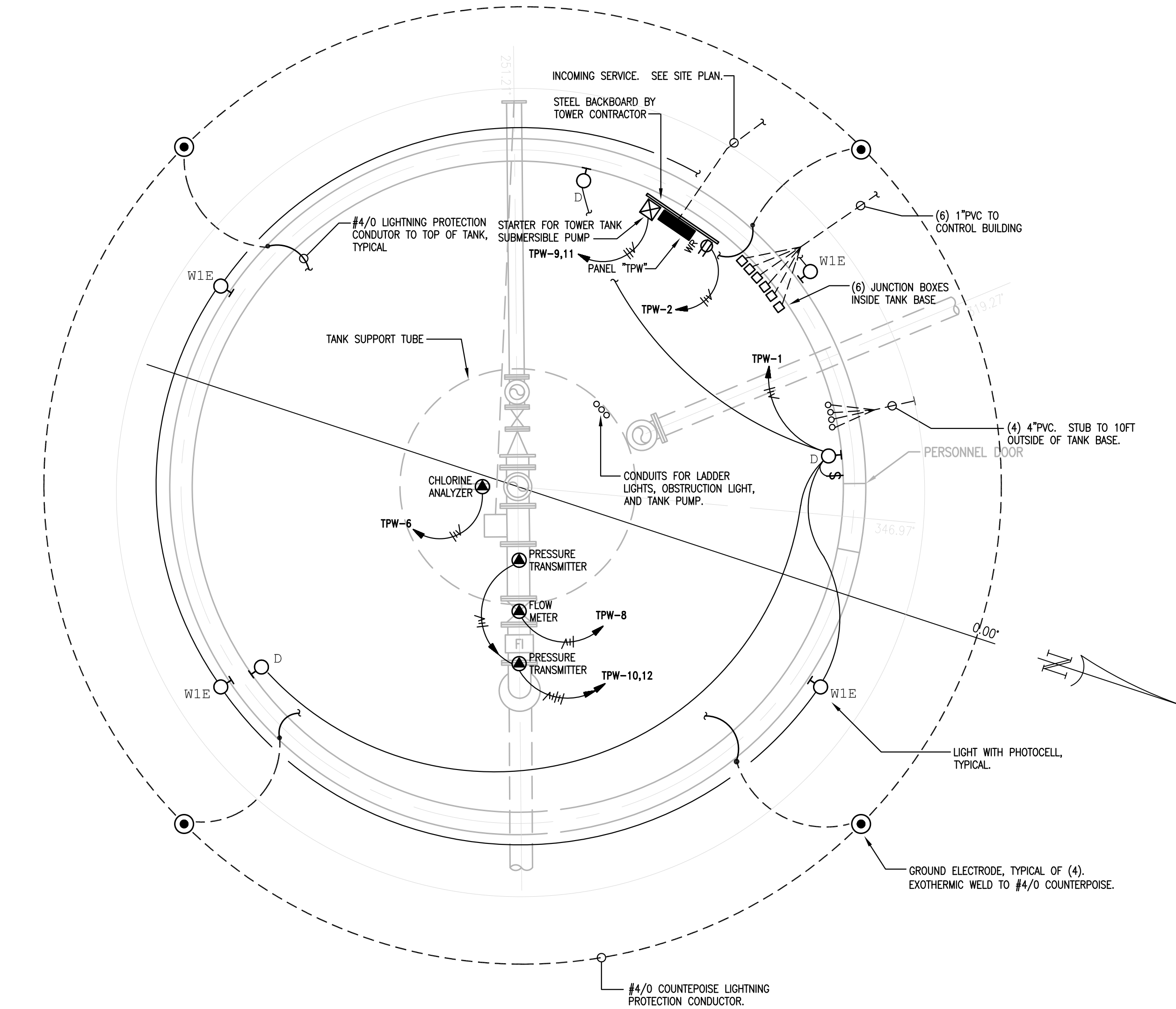


1  
E5 ELECTRICAL SITE PLAN – WILLOW WOOD  
SCALE: 1" = 20'-0"

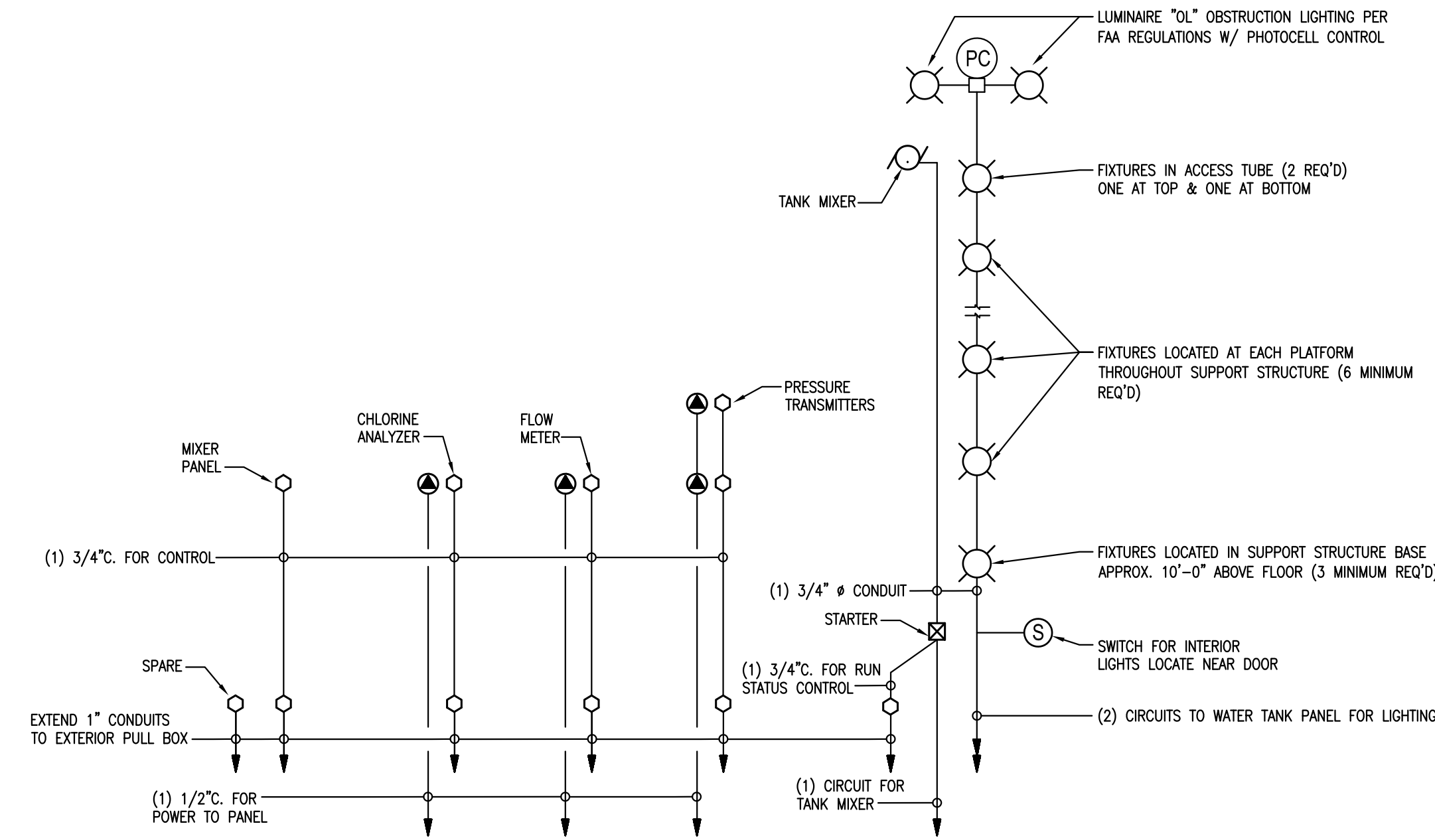




1 ENLARGED ELECTRICAL ELEVATION - ELEVATED TANK  
E6 SCALE: NOT TO SCALE



1 ENLARGED ELECTRICAL PLAN - WILLOW WOOD (ELEVATED TANK)  
E6 SCALE: 1/4" = 1'-0"



3 ONE LINE DIAGRAM - ELEVATED TANK LIGHTS  
E6 SCALE: 1/4" = 1'-0"

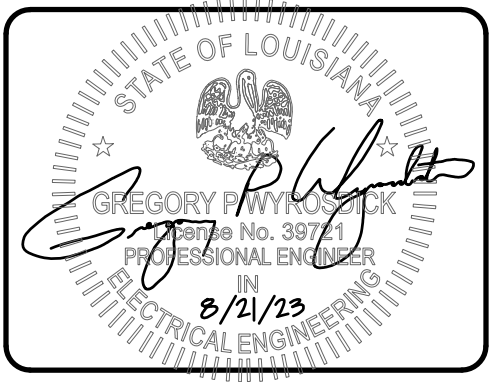
- ELECTRICAL NOTES:**
- ALL CONDUITS GALV. RIGID.
  - ALL BRANCH CIRCUIT WIRING 12 GA THIN, UNLESS NOTED OTHERWISE.
  - ALL RECEPTACLE CIRCUITS TO BE GROUND FAULT-INTERRUPT PROTECTED.
  - ALL POWER WIRING TO BE INSTALLED IN 1/2" MIN. Ø CONDUITS.
  - ALL CONTROL WIRING TO BE INSTALLED IN 3/4" MIN. Ø CONDUITS.
  - MOUNT LIGHTING SWITCHES INSIDE NEAR DOOR.
  - LABEL BRANCH BREAKERS IN PANELBOARD PER WIRING SCHEMATIC.
  - LABEL LIGHTING SWITCHES PER WIRING SCHEMATIC.
  - ALL INTERIOR LIGHT FIXTURES TO BE LED WEATHER PROOF.
  - PROVIDE OBSTRUCTION LIGHTING WITH PHOTOCELL CONTROLS PER FAA REGULATIONS
  - INSTALL ALL CONDUITS FOR POWER AND CONTROL IN SLAB OR OVERHEAD IN BASE OF TANK. CONDUITS SHALL FOLLOW STRUCTURAL MEMBERS WHERE OVERHEAD.
  - INSTALL PULL STRINGS IN ALL EMPTY CONDUIT.



DEPT. OF UTILITIES  
ST. TAMMANY PARISH  
GOVERNMENT  
620 N. TYLER STREET  
COVINGTON, LA 70433

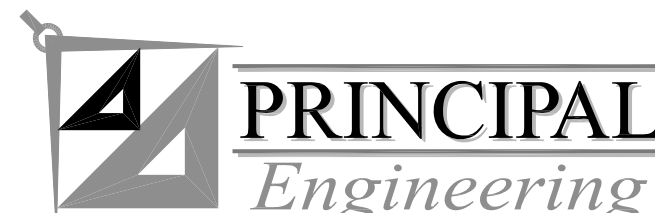
DATE:	DESCRIPTION OF REVISION

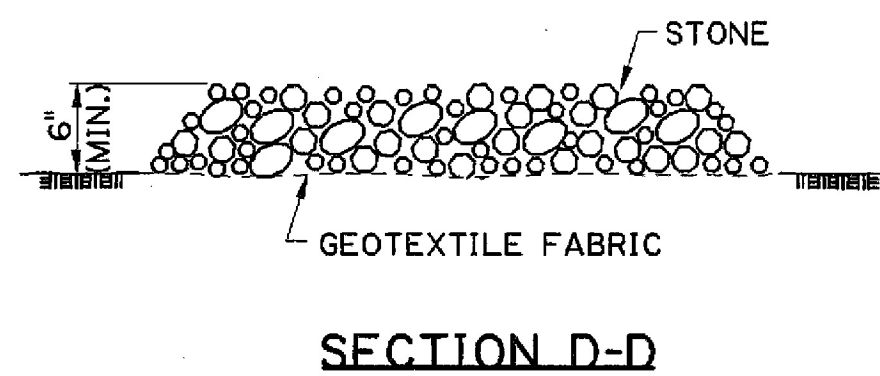
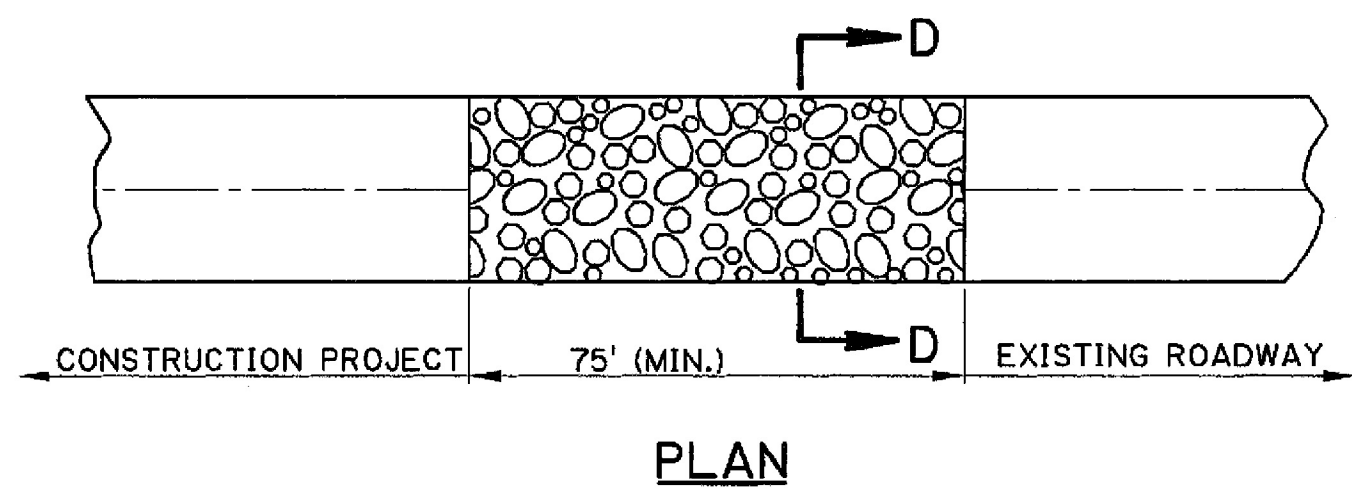
DESIGNED BY:	JWH
DRAWN BY:	JWH
CHECKED BY:	GPW
SUBMITTED BY:	PRINCIPAL ENG.
PROJECT No.:	TU22000204
ISSUE DATE:	AUG. 2023
APPROVED BY:	
SHEET SIZE:	ANSI D
SCALE:	AS SHOWN



CROSS GATES WATER SYSTEM  
NEW ELEVATED STORAGE TANK  
SLIDELL, LOUISIANA  
PROJECT No.: TU22000204  
TU22000209  
ENLARGED ELECTRICAL PLANS  
WILLOW WOOD

SHEET NO.  
E6  
SHEET 24 OF 24





### TEMPORARY STONE CONSTRUCTION ENTRANCE

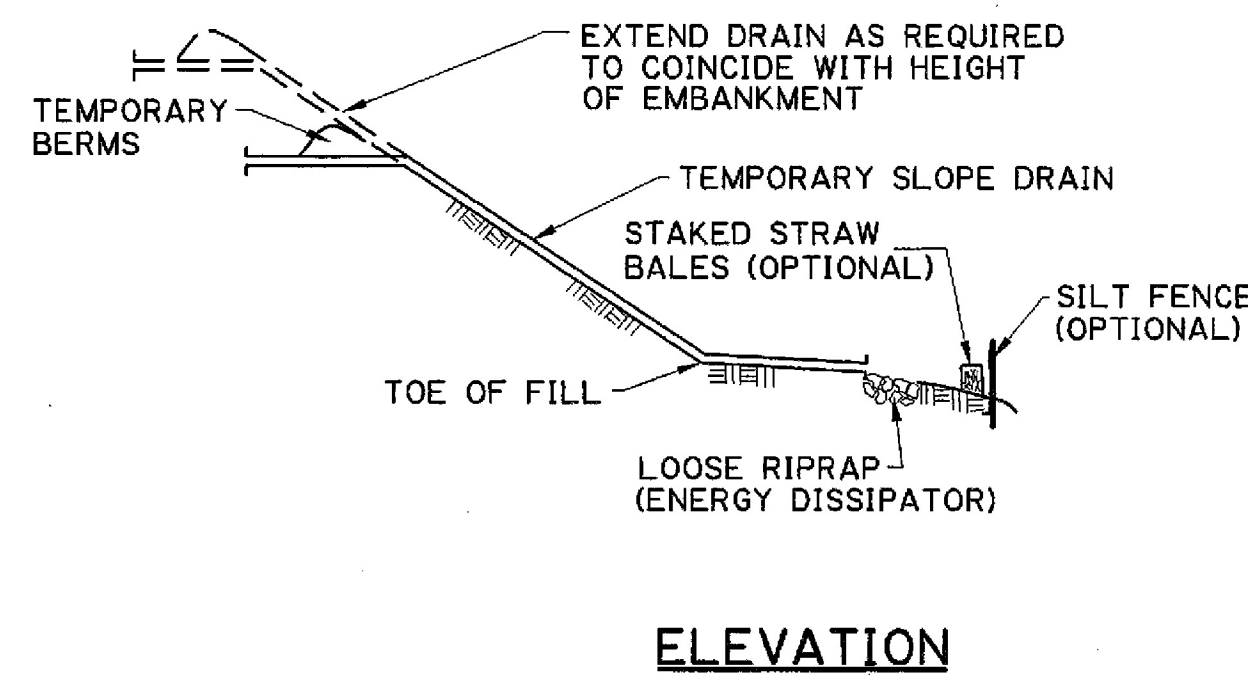
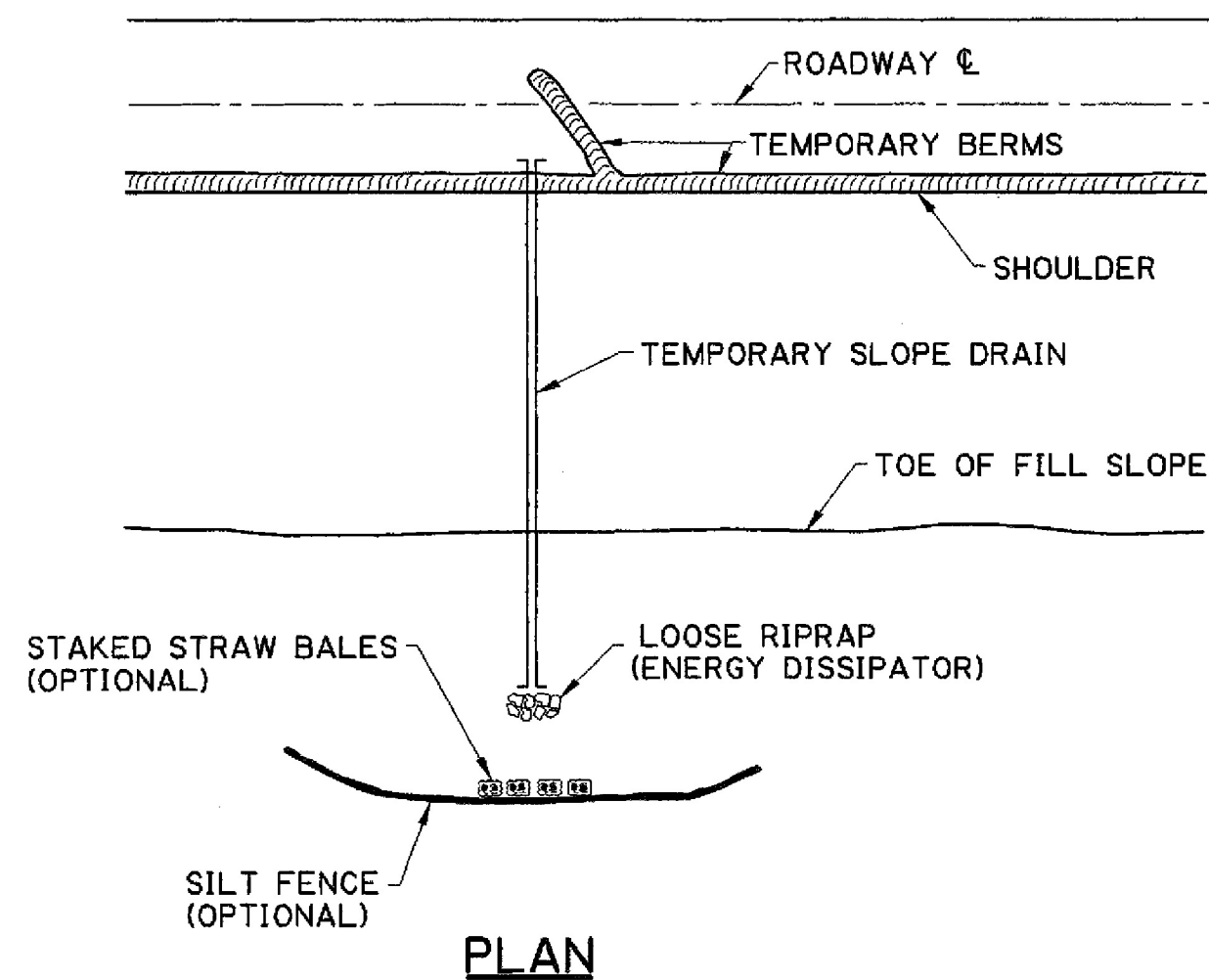
PAY ITEM: TEMPORARY STONE CONSTRUCTION ENTRANCE

**NOTES:**

**TEMPORARY STONE CONSTRUCTION ENTRANCE AND/OR WASH RACK**

A STONE STABILIZED PAD LOCATED AT POINTS OF VEHICULAR INGRESS AND EGRESS ON THE CONSTRUCTION SITE TO REDUCE THE AMOUNT OF MUD TRANSPORTED ONTO PUBLIC ROADS. IF THE ACTION OF THE VEHICLE TRAVELING OVER THE GRAVEL PAD IS NOT SUFFICIENT TO REMOVE THE MAJORITY OF THE MUD, THEN THE TIRES MUST BE WASHED BEFORE THE VEHICLE ENTERS A PUBLIC ROAD. A FEW BASIC DESIGN GUIDELINES FOR THE USE OF A STONE ENTRANCE AND/OR WASH RACKS ARE:

1. THE STONE LAYER MUST BE AT LEAST 6 INCHES THICK.
2. THE STONE SHALL CONFORM TO PROJECT SPECIFICATIONS FOR RIPRAP (CLASS 2 LB).
3. THE LENGTH OF THE PAD MUST BE A LEAST 75 FEET AND IT MUST EXTEND THE FULL WIDTH OF THE VEHICULAR INGRESS AND EGRESS.
4. A GEOTEXTILE FABRIC UNDERLINER IS REQUIRED. THE GEOTEXTILE FABRIC SHALL BE IN ACCORDANCE WITH PROJECT SPECIFICATIONS FOR GEOTEXTILE FABRIC (CLASS D).
5. IF A WASH RACK IS NECESSARY, PROVISIONS MUST BE MADE TO INTERCEPT THE WASH WATER AND TRAP THE SEDIMENT BEFORE IT IS CARRIED OFF-SITE.



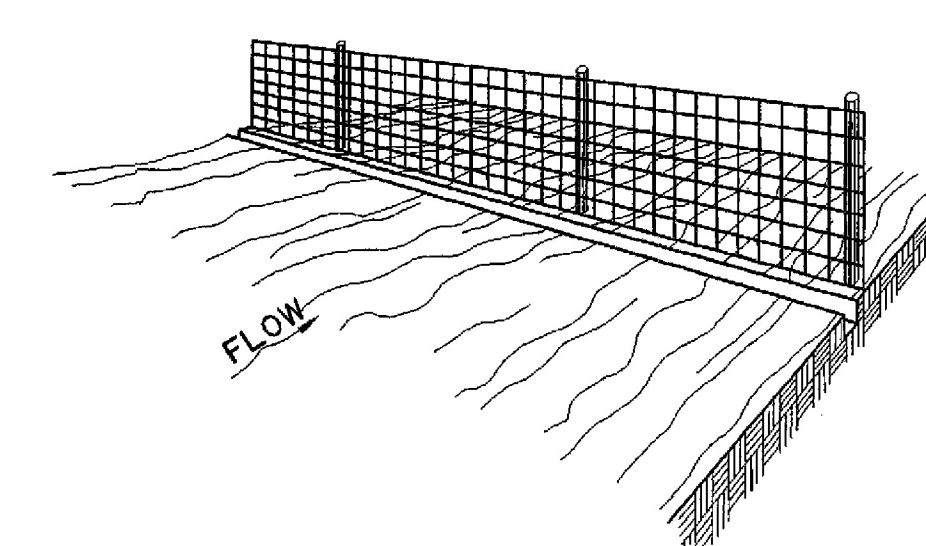
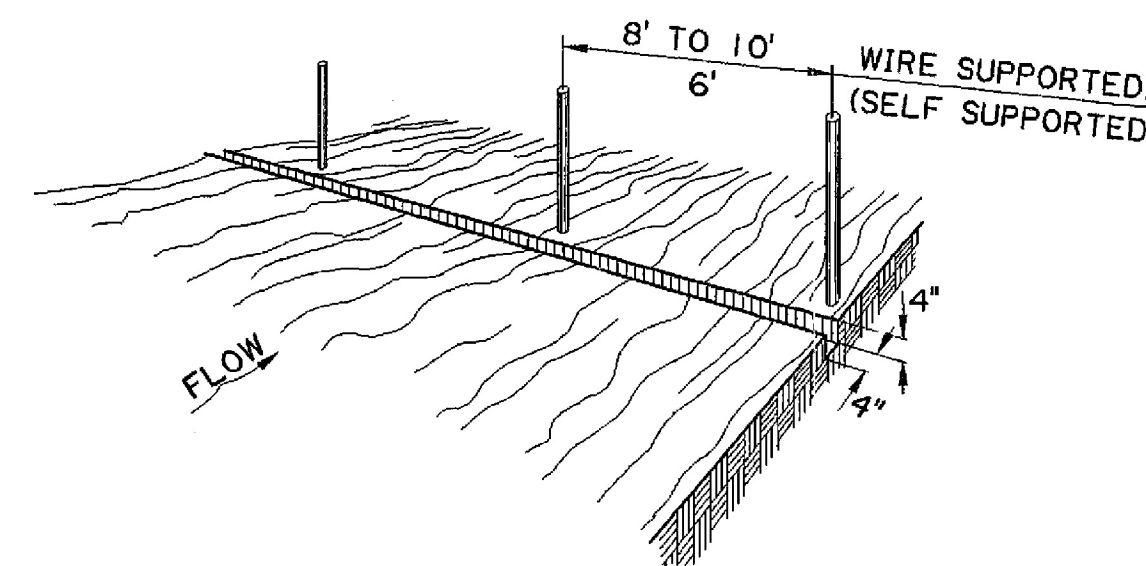
### TEMPORARY SLOPE DRAIN

A TEMPORARY SLOPE DRAIN IS A DEVICE USED TO CARRY WATER FROM THE CONSTRUCTION WORK AREA TO A LOWER ELEVATION. SLOPE DRAINS MAY BE PLASTIC SHEET, METAL OR PLASTIC PIPE, STONE GUTTERS, FIBER MATS, OR CONCRETE OR ASPHALT DITCHES. A FEW BASIC DESIGN GUIDELINES FOR THE USE OF A TEMPORARY SLOPE DRAIN ARE:

1. THE SPACING OF THE SLOPE DRAINS VARIES WITH THE ROAD GRADE.  
 FOR GRADES: 0.0% - 2.0% USE 500' SPACING  
 2.1% - 5.0% USE 200' SPACING  
 GREATER THAN 5.0% USE 100' SPACING
2. SLOPE DRAIN MATERIAL: SMOOTH PIPE - 8" MINIMUM - 3 MILS THICK MIN.  
 CORRUGATED PIPE - 12" MINIMUM  
 PLASTIC SHEETING - 4' WIDE MINIMUM  
 PLASTIC SHEETING - 3 MILS THICK MIN.
3. PLASTIC SHEETING CAN BE STAKED DOWN OR WEIGHTED WITH ROCKS OR LOGS. THE AREA UNDER THE SHEETING SHOULD BE SHAPED TO PROVIDE AN ADEQUATE CHANNEL.
4. THE OUTLET END SHOULD BE PROTECTED OR HAVE SOME MEANS OF DISSIPATING ENERGY. THE FLOW SHOULD BE DIRECTED THROUGH A SEDIMENT TRAP SUCH AS A SILT FENCE, HAY BALES, OR OTHER APPROVED SEDIMENT CONTROL DEVICES.
5. TO INSURE PROPER OPERATION, TEMPORARY SLOPE DRAINS SHOULD BE INSPECTED REGULARLY AND AFTER EACH STORM, FOR CLOGGING OR DISPLACEMENT. EROSION AT THE OUTLET SHOULD BE CHECKED AND THE SILT TRAPS CLEANED IF NECESSARY.

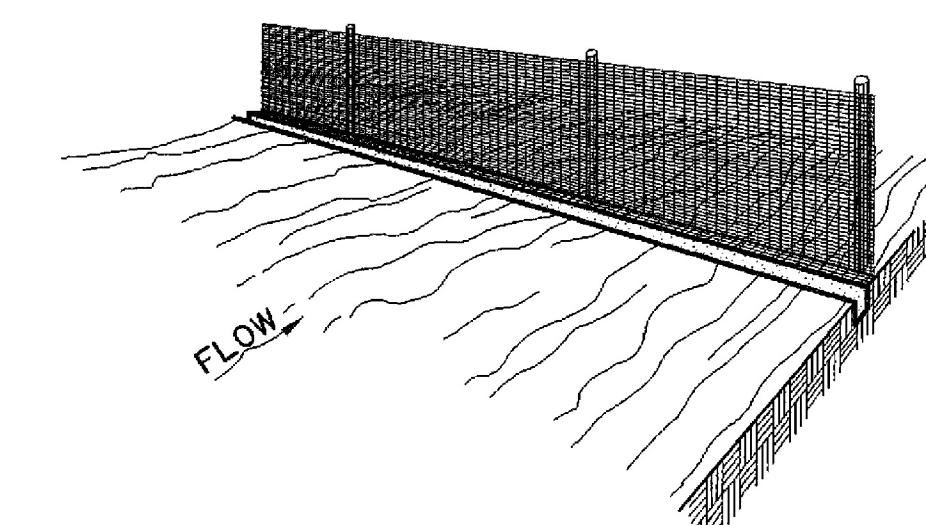
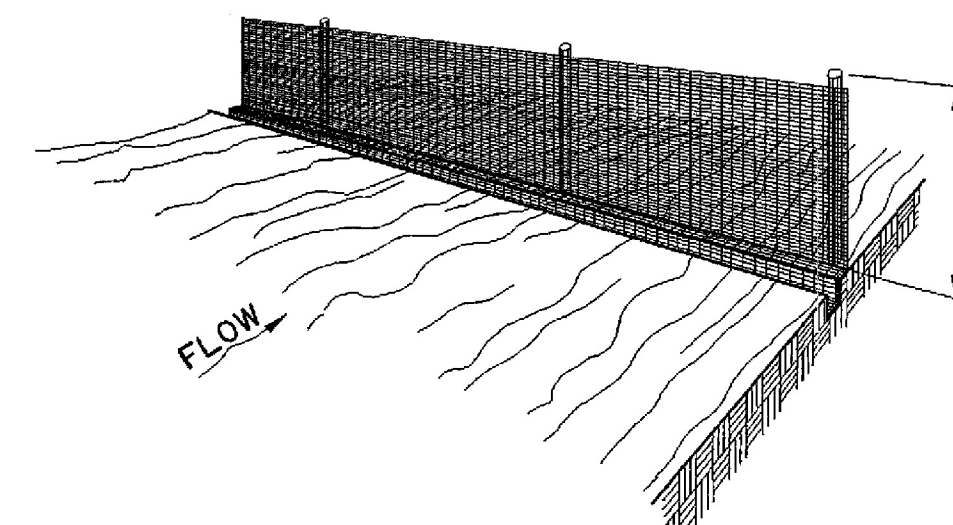
1. SET POSTS AND EXCAVATE A 4" X 4" TRENCH UPSLOPE ALONG THE LINE OF POSTS.

2. STAPLE WIRE FENCING TO THE POSTS.



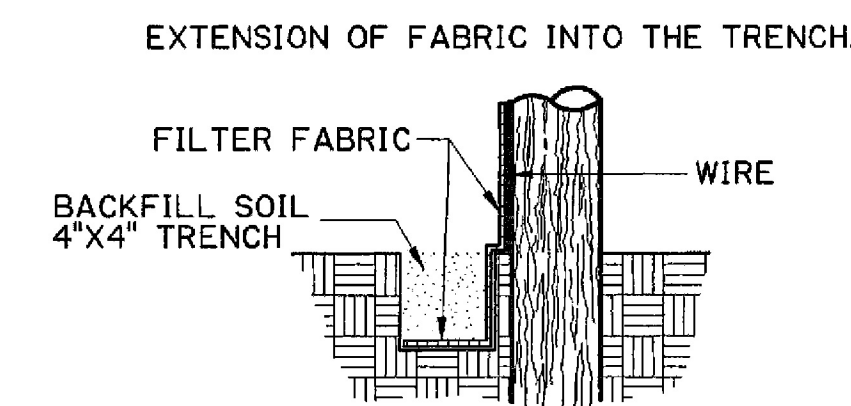
3. ATTACH THE FILTER FABRIC TO THE WIRE FENCE AND EXTEND IT INTO THE TRENCH.

4. BACKFILL AND COMPACT EXCAVATED SOIL.



### CONSTRUCTION OF TEMPORARY SILT FENCING

(WIRE SUPPORTED SILT FENCE IS SHOWN. SELF SUPPORTED SILT FENCE WILL BE CONSTRUCTED ACCORDING TO MANUFACTURERS SPECIFICATIONS.)



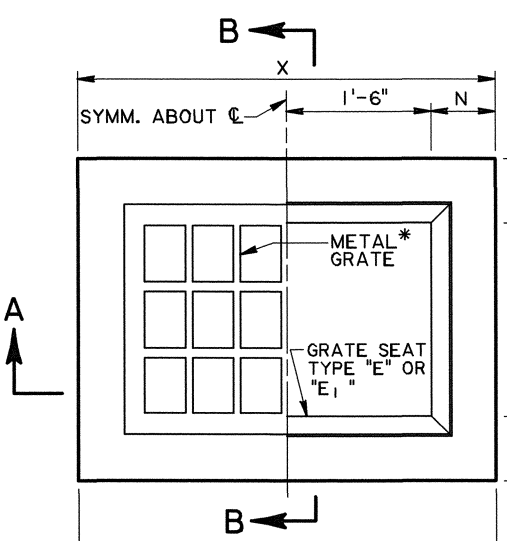
**NOTES:**

SILT FENCING IS A TEMPORARY SEDIMENT BARRIER CONSISTING OF A FILTER FABRIC SUPPORTED BY POSTS AND STRETCHED ACROSS AN AREA TO INTERCEPT AND DETAIN SMALL AMOUNTS OF SEDIMENT. THE SILT FENCING SHALL BE IN ACCORDANCE WITH PROJECT SPECIFICATIONS FOR TEMPORARY EROSION CONTROL. A FEW BASIC GUIDELINES FOR THE USE OF SILT FENCING ARE:

1. USE WHERE EROSION WOULD OCCUR IN THE FORM OF SHEET AND RILL EROSION
2. USE WHERE THE MAXIMUM DRAINAGE AREA BEHIND THE SILT FENCE IS 1/4 ACRE PER 100 FEET OF SILT FENCE LENGTH
3. USE WHERE THE MAXIMUM SLOPE LENGTH BEHIND THE BARRIER IS 100 FEET
4. USE THERE THE MAXIMUM GRADIENT BEHIND THE BARRIER IS 2:1
5. DO NOT USE SILT FENCES IN LIVE STREAMS OR IN DITCHES OR SWALES WHERE FLOWS EXCEED ONE CUBIC FOOT PER SECOND

SHEET NUMBER	
DESIGNED	JCM
CHECKED	KAJ
DATE	1-14-94
BY	JCM
DATE	12 OF 2
REVISIONS	
NO.	DESCRIPTION
10-1-08	REMOVE SPECIFIC PAY ITEM NOS., GENERAL REVISIONS
DATE	DATE: 10-1-08
APPROVED BY	W. H. Temple
CHIEF ENGINEER	
TEMPORARY EROSION CONTROL DETAILS EC-01 STANDARD PLAN	
HYDRAULICS SECTION	

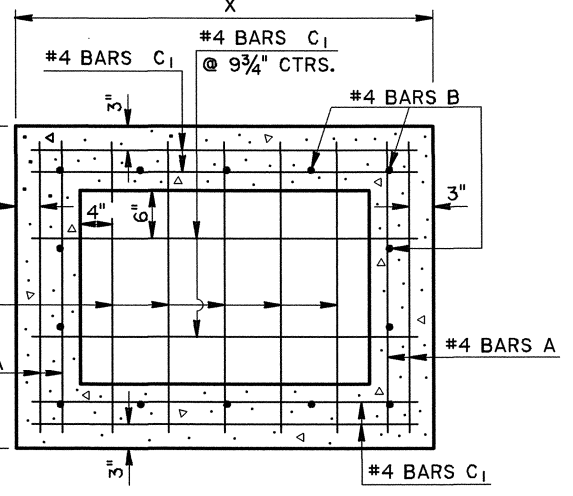
DIMENSIONS			
DEPTH OF BASIN	N	X	Y
FT.	IN.	FT.- IN.	FT.- IN.
0 - 8	7	4-2	3-2/4
8.1 - 12	8	4-4	3-4/4



**PLAN**

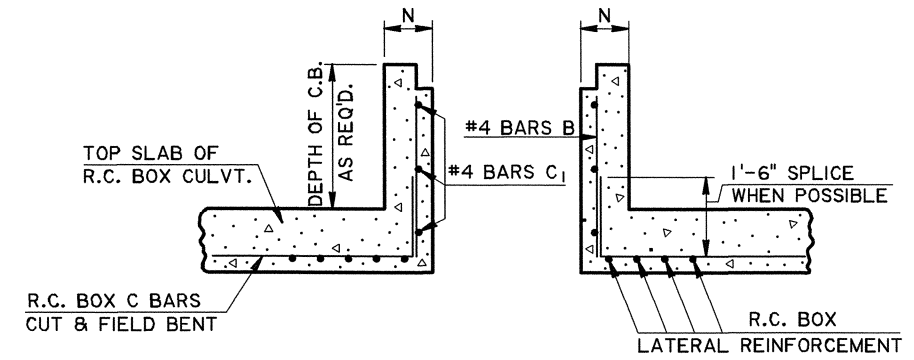
\* GRATE TO BE TYPE "B" OR "C"  
TYPE "B" SHOWN.

NOTE: TYPE "B" GRATE TO BE USED WHERE NO PEDESTRIAN TRAFFIC IS EXPECTED.  
  
TYPE "C" GRATE TO BE USED WHERE PEDESTRIAN TRAFFIC IS EXPECTED.



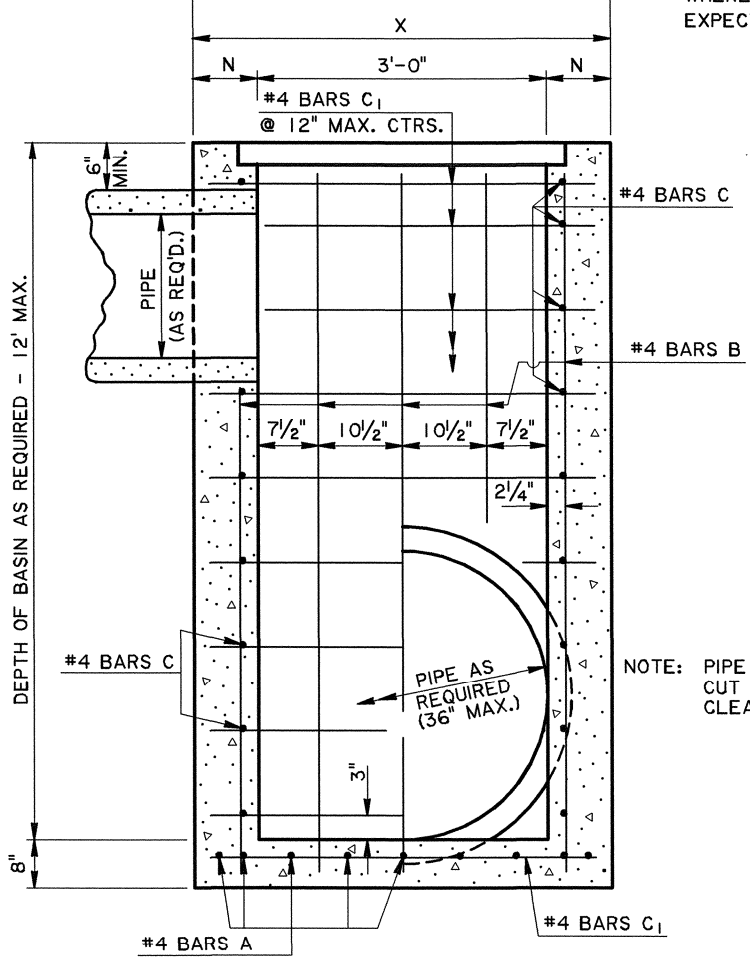
**HORIZONTAL SECTION**

SHOWING BOTTOM SLAB REINFORCING STEEL



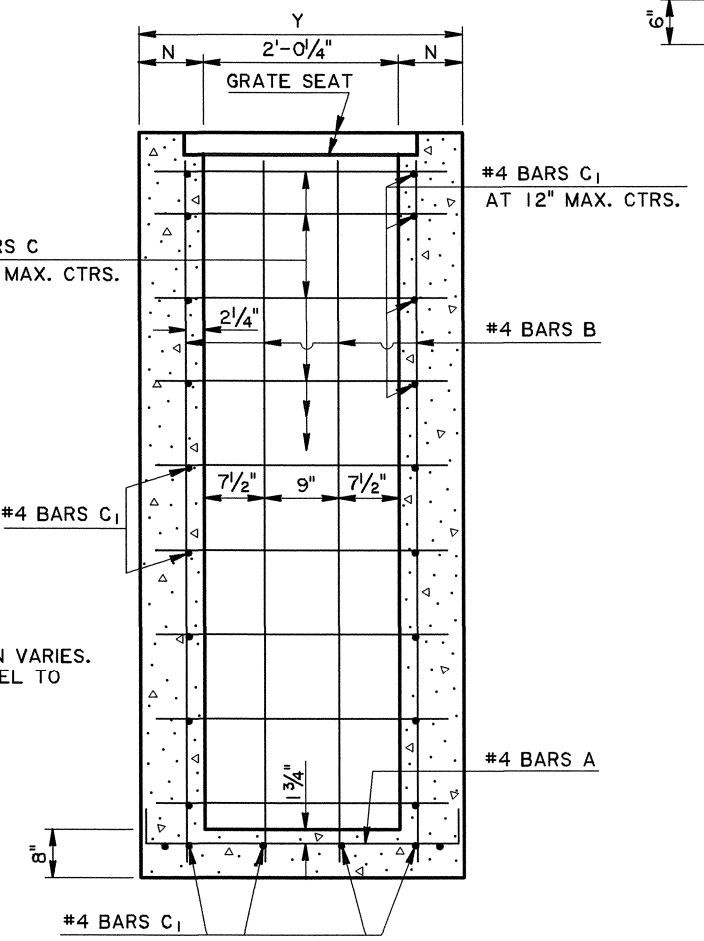
**LONGITUDINAL SECTION**

SHOWING CATCH BASIN USED WITH R.C. BOX CULVERT.

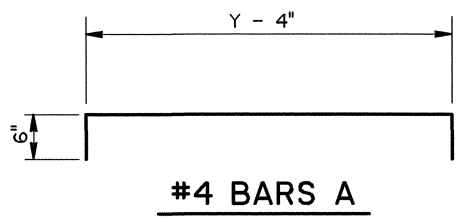


**SECTION A-A**

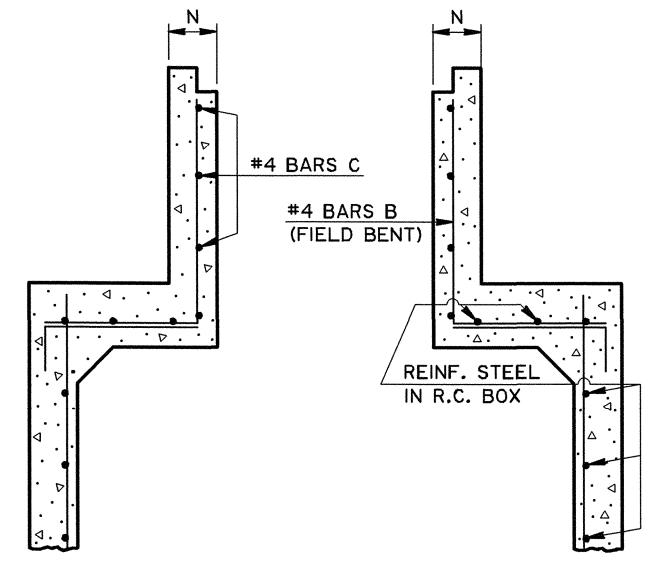
NOTE: PIPE SIZE & LOCATION VARIES. CUT REINFORCING STEEL TO CLEAR, AS REQUIRED.



**SECTION B-B**



**#4 BARS A**



**TRANSVERSE SECTION**

SHOWING CATCH BASIN USED WITH R.C. BOX CULVERT.

**GENERAL NOTES:**

- SECTION 702 OF THE CURRENT DOTD STANDARD SPECIFICATIONS SHALL APPLY.
- DIMENSIONS RELATING TO REINFORCING STEEL ARE TO BAR CENTERS.
- VERTICAL REINFORCING STEEL MAY BE SPLICED. SPLICE LENGTH IS 35 DIAMETERS.
- FOR DETAILS OF GRATE AND SEAT, SEE STD. PLAN MC-01 (TYPE B OR C).
- SEE PLANS FOR TYPE OF GRATE TO BE USED FOR EACH CATCH BASIN.



## SECTION 01010 - SUMMARY OF WORK

### PART 1 - GENERAL

#### 1.01 ORDER OF OPERATIONS

- A. The Owner has elected to construct the improvements to the Cross Gates water system with three contracts. The first contract includes the construction of two (2) new elevated steel water storage tanks; one at the Willow Wood site and one at the Ozone Pines site (this contract). The second contract includes a new well at the Ozone Pines site and improvements to the existing well at the Willow Wood site (by others). The third contract includes installation of a waterline to connect the Cross Gates System to the new Ozone Pines system (by others). The Notice to Proceed will be issued at the same time for the well and tank projects. The Notice to Proceed for the water mains project (third contract) may be delayed as determined by the Engineer.
- a. STORAGE TANK PROJECT. The contractor for this project is required to mobilize to the Willow Wood site first. The required time to complete the work at the Willow Wood site is 441 calendar days from issuance of the Notice to Proceed. It is anticipated that the tank contractor will begin work simultaneously at the Ozone Pines site while the tank at the Willow Wood site is under construction. The additional contract time to construct the second tank at Ozone Pines is 112 calendar days. The total time to complete the entire work at both sites is 553 calendar days.
  - b. WELL IMPROVEMENT PROJECT. The contractor for the well construction and well improvements project cannot mobilize to the Willow Wood site until the tank contractor has achieved substantial completion as determined by the Engineer. The contractor is then required to complete work at both sites in 714 calendar days from the Notice to Proceed.
  - c. N. MILITARY ROAD & BROWNSWITCH ROAD WATER MAINS. The work to construct the new water mains along N. Military Road and Brownsitch will be completed by others as part of another contract. The construction of the water mains may be concurrent to the water tower construction at Ozone Pines. Upon completion of the new water mains along N. Military and Brownsitch, the tank at Ozone Pines shall be connected to the expanded Cross Gates Water System.

#### 1.02 WORK REQUIRED BY THE CONTRACT

- A. The Work of this Contract consists of the construction of new elevated steel water storage tanks at the Ozone Pines site located at 61134 North Military Road in Slidell, LA and at the Willow Wood site located at 200 Cross Gates Blvd. in Slidell, LA. New elevated steel water storage tanks, associated piping, valves, controls,

equipment, testing, grading and drainage, and site work are included in the contract. Additional work includes demolition, electrical work, site cleanup, and other miscellaneous items as shown on the Drawings and specified herein.

- B. The Contractor shall perform the Work complete, in place, and ready for continuous service, and shall include repairs, testing, startup, cleanup, replacements and restoration required as a result of damages caused during this construction.
- C. The Contractor shall furnish all labor, materials, equipment, tools, services, and incidentals to complete all work required by these Specifications and as shown on the Drawings.
- D. The Contractor shall furnish and install all materials, equipment, and labor which is reasonably and properly inferable and necessary for the proper completion of the Work, whether specifically indicated in the Contract Documents or not.
- E. The Contractor shall perform the Work under a lump sum price contract as stated in the Bid Form.

#### 1.03 REQUIREMENTS

- A. The Contractor shall assume full responsibility for the protection and safekeeping of products under this Contract, stored on the site.
- B. The Contractor shall move any stored products under Contractor's control, which interfere with operations of the Owner or separate contractor.
- C. The Contractor shall obtain and pay for the use of additional storage or work areas needed for the Contractor's operations.

#### 1.04 WORK SEQUENCE

- A. The Contractor shall begin work on the project within ten (10) days of the Notice to Proceed and complete the work within the period specified in the contract.

#### 1.05 QUALITY OF WORK

- A. All work shall be subject to examination and approved by the Engineer and by all inspectors and authorities having jurisdiction. The Contractor shall replace all imperfect or condemned work with work conforming to all applicable requirements and codes to the satisfaction of the Engineer without additional cost to the Owner. If any work is covered before inspection and approval, the Contractor shall bear all costs for uncovering it, correcting it if necessary, and covering it again, at no additional cost to the Owner.

#### 1.06 ENVIRONMENTAL CONTROLS

- A. Provisions for Control of Erosion and Pollutants: Sufficient precautions shall be

taken during construction to minimize the run-off of polluting substances such as silt, clay, fuels, oils, bitumens, calcium chloride, or other materials harmful to humans, fish, or other life, into the ground and surface waters of the State. Control measures shall be adequate to assure that turbidity in the receiving waters will not be increased more than otherwise required by the State or other controlling agency. Special precautions shall be taken in the use of construction equipment to prevent operations which promote erosion. The Contractor shall be responsible for obtaining all permits in conjunction with the conveyance of storm water during construction activities.

B. In the event of inclement weather, the Contractor shall protect the Work and materials and equipment against damage or injury from the weather. Damaged Work and materials shall be removed and replaced. If, in the opinion of Engineer, any portion of Work or materials has been damaged or injured by reason of failure on the part of the Contractor to so protect the Work, neither additional time nor additional payment for removal and replacement will be given by the Owner to the Contractor.

C. Public Nuisance:

1. The Contractor shall not create a public nuisance, including, but not limited to, encroachment on adjacent lands, flooding of adjacent lands, or excessive noise.
2. Sound levels from Contractor operations shall not exceed 45 dBA 6 PM to 7 AM or 55 dBA 7 AM to 6 PM, unless approved otherwise in writing. This sound level shall be measured at the exterior of the nearest exterior wall of the nearest residence or business. Levels at operating equipment shall not exceed 85 dBA at the equipment at any time. Sound levels in excess of these values are sufficient cause to have the work halted until equipment can be quieted to these levels. Work stoppage by the Engineer for excessive noise shall not relieve the Contractor of any obligations under the contract, including, but not limited to, performance of the work at the contract time and contract price.
3. No additional payment to the Contractor will be made for time lost due to work stoppage resulting from the creation of a public nuisance.

D. Work Hours:

No work shall be done between 6:00 p.m. to 7:00 a.m. nor on Saturdays, Sundays, or legal holidays without permission of Owner. Emergency work may be done without prior permission; however, notification is required to the Engineer.

Night work may be undertaken as a regular procedure with the permission of Owner; such permission, however, may be revoked at any time by Owner

if Contractor fails to maintain adequate equipment and supervision for the proper prosecution and control of the work at night. Regular working hours shall not exceed a maximum of 40 hours per week. Requests to work during other than regular working hours as established by Contractor must be submitted to the Engineer at least 72 hours in advance of the period for such overtime work and shall set forth the proposed schedule for work to give the Engineer ample time to arrange for his personnel to be at the site of the work.

The contractor shall pay for all additional engineering charges to the Owner on account of the overtime work which may be authorized as stated above. Such engineering charges shall be a subsidiary obligation of the Contractor and no extra payment shall be made by the Owner on account of such overtime work. Engineer overtime charges shall be assessed in accordance with the terms of the Owner 's agreement with the Engineer.

E. Hazardous Locations

1. For operations in hazardous locations, the Contractor shall use spark-proof tools and explosion-proof temporary lighting and shall not use electric power tools, open flame devices, electric welding or any device or methods which might conceivably cause ignition or explosion.
2. If a working area atmosphere is unsafe, the Contractor shall furnish, install, operate, and later remove such temporary auxiliary ventilating facilities as are necessary to provide a safe atmosphere.
3. The Contractor shall instruct its employees and the employees of all subcontractors to avoid smoking while in the hazardous areas. Suitable prominent "No Smoking" signs shall be placed at locations where hazardous gas could be present.

1.07 PERMITS

Upon notice of award, the Contractor shall immediately apply for all applicable permits not previously obtained by the Owner to do the work from the appropriate governmental agency or agencies. No work shall commence until all applicable permits have been obtained and copies delivered to the Engineer. The costs for obtaining all permits shall be borne by the Contractor.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION (NOT USED)**

**END OF SECTION**

## SECTION 01025 - MEASUREMENT AND PAYMENT

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. The Contractor shall furnish all labor, materials, tools, equipment, appurtenances, and all services necessary to perform all Work required, at the lump sum or unit prices for the items listed herein.
- B. The items listed below beginning with Article 1.03 are the same pay items listed in the Unit Prices Table of Section 00300 - Louisiana Uniform Public Works Bid Form. These items constitute all the pay items for completion of the Contract. No direct or separate payment will be made for providing miscellaneous, temporary, or accessory works, plant, services, Contractor's or Engineer's field offices, layout surveys, job signs, sanitary requirements, testing, safety devices, approval and record drawings, water supplies, power, removal of waste, watchmen, bonds, insurance, taxes, and all other requirements of the Contract Documents. Compensation for all such services, things and materials required for a complete and usable facility shall be included in the prices stipulated for the lump sum and unit pay items listed herein.
- C. Alternates, if accepted, shall be accepted in the order in which they are listed on the Bid Form. Determination of the low bidder shall be on the basis of the sum of the Base Bid and any alternates accepted by the Owner. However, the Owner shall reserve the right to accept alternate(s) in any order which does not affect determination of the low bidder.

#### 1.02 ESTIMATED QUANTITIES

The estimated quantities for unit price bid items, as listed in the Louisiana Uniform Public Works Bid Form Unit Prices Table, are approximate only, and are included solely for the purpose of comparison of Bids. Certain pay item quantities are based on theoretical plan quantity and will not be adjusted; these items are noted in 1.03 or on the Drawings. The Owner does not expressly or by implication agree that the nature of the materials encountered below the surface of the ground, or the actual quantities of material encountered or required will correspond therewith and reserves the right to increase or decrease any quantity, or to eliminate any quantity, as Owner may deem necessary.

#### 1.03 PAY ITEMS

- A. ITEM 1 – WILLOW WOOD MOBILIZATION
  - 1. Description and Measurement: Includes all work as identified in Section 01505 – Mobilization associated with mobilization to the Willow Wood site.

Mobilization for this item (1) and Item 5 shall not exceed 5% of the total contract price for the Base Bid. No partial measurement will be made for this item. Measurement will be made upon completion of all required items in Section 01505.

2. Payment: Mobilization will be paid at the LUMP SUM price listed in the Unit Prices Table.

B. ITEM 2 – CONSTRUCT WILLOW WOOD 400,000-GALLON TANK & IMPROVEMENTS

1. Description and Measurement: Includes all labor, materials, equipment, and incidentals necessary for construction of a new 400,000-gallon elevated steel tank at the Willow Wood site. This item includes construction of the tank, waterlines, drainage, valves, tie-ins, equipment, controls, sitework, erosion control, tank coating, and other miscellaneous work as included in the plans and specifications.
2. Payment: Payment for this item will be paid at the LUMP SUM price listed in the Unit Prices Table.

C. ITEM 3 – WILLOW WOOD DISINFECTION

1. Description and Measurement: Includes all labor, materials, chemicals, and equipment necessary for disinfection of the completed storage tank and connecting waterlines. Measurement will be made on total project percent complete.
2. Payment: Willow Wood Disinfection will be paid by the LUMP SUM price listed in the Unit Prices Table.

D. ITEM 4 – WILLOW WOOD EQUIPMENT STARTUP

1. Description and measurement: Includes all labor, materials, equipment, factory representatives, and incidentals required to demonstrate that the installed equipment at the Willow Wood site has been installed per the specified project requirements and has passed all required tests and evaluations. Measurement will be made by percentage complete according to the schedule of values submitted by the Contractor and accepted by the Engineer.
2. Payment: Willow Wood Equipment Startup will be paid in the amount of the lump sum contract price upon successful completion of all testing and performance evaluations required by the specifications. No partial payment will be made for this item.

E. ITEM 5 – OZONE PINES MOBILIZATION

1. Description and measurement: Includes all work as identified in Section 01505 – Mobilization associated with mobilization to the Ozone Pines site. Mobilization for this item (5) and Item 1 shall not exceed 5% of the total contract price for the Base Bid. No partial measurement will be made for this

- item. Measurement will be made upon completion of the required items in Section 01505.
2. Payment: Ozone Pines Mobilization shall be paid by the LUMP SUM price given in the prices bid table.
- F. ITEM 6 – CONSTRUCT OZONE PINES 400,000 GALLON TANK & IMPROVEMENTS
1. Description and measurement: Includes all labor, materials, equipment and incidentals required for construction of a new 400,000-gallon elevated tank at the Ozone Pines site. This includes construction of the tank, waterlines, drainage, valves, tie-ins, equipment, controls, sitework, erosion control, tank coating, and other miscellaneous work as included in the plans and specifications.
  2. Payment: This item shall be paid for at a LUMP SUM price given in the prices bid table.
- G. ITEM 7 – OZONE PINES DISINFECTION
1. Description and measurement: Includes all labor, materials, chemicals, equipment and incidentals required for disinfection of the completed storage tank and connecting waterlines. Measurement will be made on total project percent complete.
  2. Payment: Item 7 shall be paid by a LUMP SUM price given in the prices bid table.
- H. ITEM 8 – OZONE PINES EQUIPMENT STARTUP
1. Description and measurement: Includes all labor, materials, equipment, factory representatives, and incidentals required to demonstrate that the installed equipment at the Ozone Pines site has been installed per the specified project requirements and has passed all required tests and evaluations. Measurement will be made by percentage complete according to the schedule of values submitted by the Contractor and accepted by the Engineer.
  2. Payment: Item 8 shall be paid for at the LUMP SUM price given in the prices bid table.
- I. ITEM 9 – OZONE PINES TIE-IN TO EXISTING WATERLINE
1. Description and measurement: Includes all labor, materials, equipment, and incidentals required for the tie-in to the 12” waterline on site installed by the water system contractor. This includes installation of the waterline needed to connect to the 12” waterline, restrained closure piece, excavation, backfill, and testing, and other miscellaneous work as included in the plans and specifications.

2. Payment: Item 9 shall be paid for at the LUMP SUM price given in the prices bid table.

J. ITEM 10 – DEDUCT FOR CONSTRUCT WILLOW WOOD 300,000-GALLON TANK & IMPROVEMENTS

1. Description and Measurement: Includes all labor, materials, equipment, and incidentals necessary for construction of a new 300,000-gallon elevated steel tank at the Willow Wood site. This item includes construction of the tank, waterlines, drainage, valves, tie-ins, equipment, controls, sitework, and other miscellaneous work as included in the plans and specifications. The amount bid for this item (No. 10) shall be a deductive amount for the installation of a 300,000-gallon tank in lieu of a 400,000-gallon tank. When this alternative item is considered, the amount bid for this item will be subtracted from the base bid.
2. Payment: Item 9 shall be paid based on the amount bid for the 400,000-gallon tank, (Item No. 2) minus the amount bid for this item (No. 10).

K. ITEM 11 – DEDUCT FOR CONSTRUCT OZONE PINES 300,000-GALLON TANK & IMPROVEMENTS

1. Description and measurement: Includes all labor, materials, equipment, and incidentals required for construction of a new 300,000-gallon elevated tank at the Ozone Pines site. This includes construction of the tank, waterlines, drainage, valves, tie-ins, equipment, controls, sitework, and other miscellaneous work as included in the plans and specifications. The amount bid for this item (No. 11) shall be a deductive amount for the installation of a 300,000-gallon tank in lieu of a 400,000-gallon tank. When this alternative item is considered, the amount bid for this item will be subtracted from the base bid.
2. Payment: Item 11 shall be paid based on the amount bid for the 400,000-gallon tank, (Item No. 6) minus the amount bid for this item (No. 11).

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**



## SECTION 01041 - PROJECT COORDINATION

### PART 1 - GENERAL

#### 1.01 REQUIREMENTS

The Contractor shall plan, schedule, and coordinate his operations in a manner that will facilitate the simultaneous progress of the work included under other contracts outside the scope of these Contract Documents. The Contractor shall plan, schedule and coordinate with all utilities in a manner conducive to timely and efficient progress in the execution of the contract.

#### 1.02 NOTICE TO PROPERTY OWNERS AND UTILITIES

A. The Contractor shall, as provided in the General Conditions, notify owners of adjacent property and utilities when prosecution of the Work may affect them. Utilities and other concerned agencies shall be contacted at least 48 hours prior to cutting or closing streets or other traffic areas or excavating near underground utilities or pole lines. When it is necessary to temporarily deny the access of owners or tenants to their property, or when any utility service connections must be interrupted, Contractor shall give notices sufficiently in advance to enable the affected persons to provide for their needs. Notices shall conform to any applicable local ordinance and, whether delivered orally or in writing, shall include appropriate information concerning the interruptions and instructions on how to limit their inconvenience.

B. Notice to Electric Utility:

The Contractor shall review with Electric Utility the construction methods to be used in the vicinity of that entity's power lines. This review shall establish which lines, if any, need temporary relocation or de-energizing work being required. The Contractor shall be responsible for notifying and coordinating with Utility officials prior to and during the construction of all facilities within the project limits. The Contractor shall schedule work activities in cooperation with the utility personnel to ensure uninterrupted electrical service to the public. The Contractor shall coordinate all construction activities that affect Electric Utility facilities through the local representative of the local office.

C. Notice to Gas Utility:

The Contractor shall review with the Gas Utility any work to be done in the vicinity of gas lines. Where temporary relocation of gas lines or reinforcement of coating is required, the Contractor shall meet with the Gas Utility as soon as possible, but no less than thirty (30) days in advance of when relocation is required. The Contractor shall give at least 48 hours' notice for temporary

shutdown of gas mains and other notification as required by the Gas Utility when working in the vicinity of gas mains.

#### 1.03 CONNECTIONS TO EXISTING FACILITIES

- A. Unless otherwise specified or indicated, the Contractor shall make all necessary connections to existing facilities including structures, drain lines, and shall make all necessary connections to existing utilities such as water, sewer, gas, telephone, and electric. In each case, the Contractor shall receive permission from the Owner or the Utility prior to undertaking connections. A minimum of 48 hours of prior notification is required. The Contractor shall protect facilities against deleterious substances and damage.
- B. Connections to existing facilities which are in service shall be thoroughly planned in advance, and all required equipment, materials and labor shall be on hand at the time of undertaking the connections. Work shall proceed continuously (around the clock if necessary) to complete connections in the minimum time. Operation of valves of other appurtenances on existing utilities, when required, shall be by or under the direct supervision of the utility company.

#### 1.04 OPERATION OF EXISTING FACILITIES

- A. All existing facilities shall be kept in continuous operation throughout the construction period. No interruption will be permitted. Provided permission, if any, is obtained from the Owner in advance, portions of the existing facilities may be taken out of service for short periods corresponding with periods of minimum service demands.
- B. The Contractor shall provide temporary facilities and make temporary modifications as necessary to keep the existing facilities in operation during the construction period.

#### 1.05 COORDINATION OF STRUCTURAL, MECHANICAL, AND ELECTRICAL WORK

The Contractor shall coordinate all details of the equipment with other related parts of the Work including verification that all structures, piping, wiring, and equipment components are compatible. The Contractor shall be responsible for all structural and other alterations in the Work required to accommodate equipment differing in dimensions or other characteristics from that shown in the Contract Drawings or Specifications.

### **PART 2 - PRODUCTS (NOT USED)**

### **PART 3 - EXECUTION (NOT USED)**

### **END OF SECTION**

## SECTION 01043 - JOB SITE ADMINISTRATION

### PART 1 - GENERAL

#### 1.01 SITE ADMINISTRATION

- A. The Contractor shall be responsible for all areas of the site used by the Contractor and shall exert full control over the actions of all employees, all subcontractors, all suppliers, and other persons with respect to the use and preservation of property and existing facilities, except as such controls are specifically reserved to the Owner and the Engineer. A full-time superintendent, who is a regular full-time employee of the Contractor, shall be on site at all times during the Work. The Contractor's full-time superintendent shall be on site at all times during the Work, including any activities by subcontractors or suppliers.
- B. The Contractor has the right to exclude from the areas of the site used by the Contractor all persons who have no purpose related to the Work or its inspection, except the Owner's personnel required to operate and maintain the existing treatment facilities. The Contractor may require all persons in the areas of the site used by the Contractor to observe the same safety regulations as required of its employees.

#### 1.02 UNFAVORABLE CONSTRUCTION CONDITIONS

- A. The Contractor shall confine his operations to work which will not be adversely affected by unfavorable weather, wet ground, or other unsuitable construction conditions. No portion of the Work shall proceed under conditions which would adversely affect the quality or efficiency of the Work unless suitable special precautions or countermeasures are taken by the Contractor.

#### 1.03 LAND FOR CONSTRUCTION PURPOSES

- A. The Contractor shall provide arrangements with the Owner for any land required for construction purposes including the storage of materials and equipment. The location and extent of the areas so used shall be as directed by the Owner. The Contractor shall immediately move stored material or equipment if any occasion arises, as determined by Owner, requiring access to the area used for storage. Materials or equipment shall not be placed on the property of Owner until Owner has agreed to the location to be used for storage.
- B. The Contractor shall provide arrangements for additional land required for construction, if necessary, beyond that furnished by the Owner. This work shall be considered a subsidiary obligation of the Contractor and all costs in connection therewith shall be absorbed by the Contractor.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

## SECTION 01047 - CONTROL OF WORK

### PART 1 - GENERAL

#### 1.01 SITE WORK

- A. The Contractor shall furnish all necessary equipment and labor that will be sufficient to produce a satisfactory quality of work at a rate of progress which will insure the completion of the work within the Contract Time. If at any time such equipment and labor appear to the Engineer to be insufficient for producing the quality of work required at the rate of progress aforesaid, the Engineer may order the Contractor to increase the efficiency, change the character, increase the personnel, or increase the equipment, and the Contractor shall conform to such order. Failure of the Engineer to give any such order shall in no way relieve the Contractor of the obligation to complete the Work within the Contract Time.

#### 1.02 PRIVATE LAND

- A. Contractor shall not enter or occupy private land outside of easements, except by permission of the landowner.

#### 1.03 OPEN EXCAVATIONS

- A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights, and other means to prevent accidents to persons and damage to property. The Contractor shall provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the surrounding conditions but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of the open trench, prohibiting stacking excavated material in the street, and requiring that the trench shall not remain open overnight.
- B. The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.

#### 1.04 TEST PITS

- A. Test pits for the purpose of locating underground pipeline or structures in advance of underground construction features shall be excavated and backfilled at the direction of the Engineer. Test pits shall be backfilled immediately after their purpose has been satisfied and the surface restored and maintained in a manner satisfactory to the Engineer.

## 1.05 CARE AND PROTECTION OF PROPERTY

- A. The Contractor shall be responsible for the preservation of all public and private property and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be restored by the Contractor, at the Contractor's expense, to a condition similar or equal to that existing before the damage was done.

## 1.06 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES

- A. The Contractor shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, signs, services to buildings, utilities in the street, gas pipes, water pipes, hydrants, sewers, drains and electric and telephone cables, whether or not they are shown on the Drawings. The Contractor shall carefully support and protect all such structures and utilities from damage of any kind. Any damage resulting from the Contractor's operations shall be repaired by the Contractor.
- B. Assistance will be given the Contractor in determining the location of existing services. The Contractor, however, shall bear full responsibility for obtaining all locations of underground structures and utilities (including existing water services, electrical duct banks, drain lines and sewers). Services to buildings shall be maintained, and all costs or charges resulting from damage thereto shall be borne by the Contractor.

## 1.07 CLEANUP AND DISPOSAL OF EXCESS MATERIAL

- A. During execution of the Work, the Contractor shall keep the site of its operations in as clean and neat a condition as is possible. The Contractor shall dispose of all residues resulting from the Work and, at the conclusion of the Work, shall remove and haul away any surplus excavation, broken pavement, lumber, equipment, temporary structures, and any other refuse remaining from the construction operations and shall leave the entire site of the work in a neat and orderly condition.
- B. In order to prevent environmental pollution arising from the construction activities related to the performance of this Contract, the Contractor shall comply with, and shall require all subcontractors to comply with, all applicable Federal, State and local laws and regulations concerning waste material disposal, as well as the specific requirements stated in this Section and elsewhere in the Specifications.

## **PART 2 - PRODUCTS (NOT USED)**

## **PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

## SECTION 01050 - SITE CONDITION VIDEO SURVEY

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. Prior to the start of construction on the Contract, the Contractor shall furnish to the Engineer audio-video recordings (AVR's) of the construction area. In addition, the Contractor shall supply the (AVR's) of the interior and exterior of structures requested by the Owner. Also, date stamped photos of the inside of the structures are required of the surveyed properties. The minimum coverage area of the structures that require this survey is indicated on the plans. The Engineer shall review the AVR's and photos and either approve or additional coverage will be required to fully show the physical conditions of the work areas. The Contractor shall have the additional coverage recorded and shall not begin work, including moving equipment and/or material on the project site, until the AVR survey has been approved by the Engineer. After approval, the Contractor shall supply two copies of the AVR's and photos to the Engineer. One copy of the AVR and photos will remain available for viewing by the Contractor and may be reviewed by him for any assistance that the AVR and photos may provide in resolving disputes, which arise with the property owners claiming improper restoration of their properties. That copy of the AVR, and photos will also be used as a guide by the Engineer, prior to issuance of final payments, in determining the adequacy of restoration and the extent of damage attributable to the Contractor's work. The remaining copy of the AVR and photos will be delivered to the Owner. The video and photos will be used as a record of existing site conditions and as a guide by the Engineer, prior to issuance of final payments, in determining the adequacy of restoration and the extent of damage attributable to the Contractor's work.
- B. The Contractor is required to get signed consent from the property owner prior to conducting the survey. If the property owner does not allow access to their property, documentation shall be provided to the Engineer.

### PART 2 - PRODUCTS

#### 2.01 TECHNICAL REQUIREMENTS

- A. The total audio-video recording system and the procedures employed in its use shall be such as to produce a finished product that will fulfill the technical requirements of the project, as well as those more subjective requirements of high-quality audio and video production. The video portion of the recording shall reproduce bright, sharp, clear pictures with accurate colors and shall be free from distortion, tearing, rolls or any other form of picture imperfection. The audio portion of the recording shall reproduce precise and concise explanatory notes by the camera operator with proper volume, clarity, and freedom from distortion.

## 2.02 OPERATOR EXPERIENCE

The video survey should be conducted by an independent company experienced in this field. The operator in charge of the video recording should have had previous experience video documenting a minimum of five (5) public works construction projects. Any apprentice operators should be continuously supervised by an above-described experienced operator.

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. Coverage. The video recording shall include coverage of all surface features located within the construction zone-of-influence. This zone shall be defined as (1) the area within the construction site, and areas directed by the Owner as described above. The surface features within the construction zone shall include, but not be limited to, all structures, slabs, sidewalks, retaining walls, equipment, and fences. Of particular concern shall be the existence, or non-existence, of any faults, fractures, or defects.
- B. Identification Summary. At the start of production, at the beginning of a new tank site, an identification summary shall be read into the record while, at the same time, a wide-angle view with numeric displays shall be provided for a visual record. This summary will include (1) tape number, (2) job title, (3) job location, (4) positional location at job start, (5) date and time, (6) weather and (7) any other notable conditions.
- C. Character Printout. All video recordings must, by electronic means, display continuously and simultaneously, generated transparent digital information to include (1) the date and the time of the recording, or as directed by the Engineer, (3) the name of the site, (4) the project name, and (5) the direction of the view. The time and date shall appear linearly in the bottom left-hand corner (e.g., 9-20-15 8:30:15).

The remainder of the printed information shall appear at the bottom of the viewing screen. To maximize viewing area no more than twenty-four rasters shall be used to express the transparent digital information.

- D. Visibility. No recording shall be done during periods of significant precipitation, mist, or fog. The recording shall only illuminate the subjects of recording.

### 3.02 RECORDING SCHEDULE

The preconstruction video recording shall be performed prior to the placement of any construction materials or equipment on the proposed construction site, but not more than seven weeks prior to the placement of materials or equipment.



### 3.03 VIDEO INDEXING

All discs and their storage cases shall be properly identified by video index number, project title and general project location. Displayed on the storage case of each video shall be a log of that disc's contents. That log shall describe the various segments contained on that disc, coverage start, direction, and endpoints, with corresponding video disc player counter numbers. A cumulative index correlating the various segments of coverage to their corresponding tapes shall be typed and supplied to the Owner.

### 3.04 UNACCEPTABLE DOCUMENTATION

The Engineer/Owner shall have the authority to reject all or any portion of the video documentation not conforming to the specifications. Those rejected portions shall be resurveyed at no additional cost to the Owner.

**END OF SECTION**

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## SECTION 01090 - REFERENCE STANDARDS

### PART 1 - GENERAL

#### 1.01 REQUIREMENTS INCLUDED

Abbreviations and acronyms used in the Contract Documents to identify reference standards.

#### 1.02 QUALITY ASSURANCE

- A. Application: When a standard is specified by reference, the Contractor shall comply with requirements and recommendations stated in that standard, except when requirements are modified by the Contract Documents or applicable codes establish stricter standards.
- B. Publication Date: The publication in effect on the date of issue of the Contract Documents, except when a specific publication date is specified.

#### 1.03 ABBREVIATIONS, NAMES, AND ADDRESSES OF ORGANIZATIONS

The Contractor shall obtain copies of referenced standards directly from the publication source, when needed for proper performance of work, or when required for submittal by the Contract Documents.

AA	Aluminum Association 818 Connecticut Avenue, N.W. Washington, DC 20006
AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street, N.W. Washington, DC 20001
ACI	American Concrete Institute Box 19150, Reford Station Detroit, MI 48219
AI	Asphalt Institute Asphalt Institute Building College Park, MD 20740
AISC	American Institute of Steel Construction 1221 Avenue of the Americas New York, NY 10020

AISI	American Iron and Steel Institute 1000 16th Street, N.W. Washington, DC 20036
ANSI	American National Standards Institute 1430 Broadway New York, NY 10018
ASHRAE	American Society of Heating, Refrigerating and Conditioning Engineers 1791 Tullie Circle, N.E. Atlanta, GA 30329
ASME	American Society of Mechanical Engineers Two Park Avenue New York, NY 10016
ASTM	American Society for Testing and Materials 100 Bar Harbor Drive West Conshocken, PA 19428
AWWA	American Water Works Association 6666 W. Quincy Avenue, Denver, CO 80235
AWS	American Welding Society 2501 NW 7th Street Miami, FL 33125
CRSI	Concrete Reinforcing Steel Institute 180 North LaSalle Street, Suite 2110 Chicago, IL 60601
FS	Federal Specification General Services Administration Specifications and Consumer Information Distribution Section (WFSIS) Washington Navy Yard, Building 197 Washington, DC 20407
LSSRB	Louisiana Standard Specifications for Roads and Bridges Louisiana Department of Transportation and Development Headquarters Administration Building - Room 100 1201 Capitol Access Road Baton Rouge, Louisiana 70802

MLSFA	Metal Lath/Steel Framing Association 221 North LaSalle Street Chicago, IL 60601
NAAMM	National Association of Architectural Metal Manufacturers 221 North LaSalle Street Chicago, IL 60601
NEMA	National Electrical Manufacturers' Association 2101 L Street, N.W. Washington, DC 20037
OSHA	Occupational Safety and Health Administration 200 Constitution Ave NW Washington, DC 20210
PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 20076
PCI	Prestressed Concrete Institute 20 North Wacker Drive Chicago, IL 60606
SDI	Steel Door Institute 712 Lakewood Center North Cleveland, OH44107
SMACNA	Sheet Metal and Air Conditioning Contractors" National Association 8224 Old Court House Road Vienna, VA 22180
SSPC	Steel Structures Painting Council 4400 Fifth Avenue Pittsburg, PA
UL	Underwriters' Laboratories, Inc. 333 Pfingston Road Northbrook, IL 60062

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

## SECTION 01152 - APPLICATIONS FOR PAYMENT

### PART 1 - GENERAL

#### 1.01 REQUIREMENTS INCLUDED

The Contractor shall submit applications for payment to the Engineer in accord with the schedule established by Conditions of the Contract.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Agreement between Owner and Contractor: Lump-Sum.
- B. Conditions of the Contract: Progress Payments, Retainages and Final Payment.
- C. Section 01380: Construction Photographs.
- D. Section 01700: Contract Closeout.

#### 1.03 FORMAT AND DATA REQUIRED

- A. The Contractor shall submit payment applications in the form required by the Owner with itemized data typed on 8 ½ x 11 white paper continuation sheets.
- B. The Contractor shall provide itemized data on continuation sheet: format, schedules, line items and values.

#### 1.04 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

- A. All payment applications shall be accompanied by a completed pay application checklist and shall include a signed affidavit regarding previous payments received, a short progress narrative describing work performed since previous payment submittal, progress photos as per Section 01380, current updated project schedule, and invoices for any stored materials billed. The pay application checklist form shall be as provided on Page 01152-3. All items required on the checklist must be included with each pay application for the application to be processed.
- B. When the Owner or the Engineer requires additional substantiating data, the Contractor shall submit suitable information, with a cover letter.
- C. The Contractor shall submit one copy of all data required with a cover letter for each monthly pay application. Any additional substantiating data requested shall also be submitted as required in Part B above.

#### 1.05 PREPARATION OF APPLICATION FOR FINAL PAYMENT

- A. The Contractor shall complete application form as specified for progress payments.
- B. The Contractor shall use continuation sheet for presenting the final statement of accounting as specified in section 01700 - Contract Closeout.

#### 1.06 SUBMITTAL PROCEDURE

- A. The Contractor shall submit applications for payment to the Engineer at the times stipulated in the Agreement.
- B. Number required: Three original copies of each application, or as determined at the Preconstruction Conference.
- C. Once the Engineer determines the application properly completed and correct, a certificate for payment will be prepared and transmitted to the Owner, with a copy to the Contractor.

#### **PART 2 - PRODUCTS (NOT USED)**

#### **PART 3 - EXECUTION (NOT USED)**



PAY APPLICATION CHECKLIST  
(CONSTRUCTION CONTRACT)

PARTIAL APPLICATION:

- Pre-Construction Video (Date Submitted): \_\_\_\_\_
- Construction Schedule (Updated) \_\_\_\_\_
- Progress Narrative \_\_\_\_\_
- Schedule of Values \_\_\_\_\_
- Affidavit Re: Previous Payments \_\_\_\_\_
- Progress Photos \_\_\_\_\_
- List of Stored Materials Billed \_\_\_\_\_
- Invoice for Stored Materials Billed \_\_\_\_\_
- Insurance for (off Site) \_\_\_\_\_
- Stored Materials Billed \_\_\_\_\_

FINAL APPLICATION:

- Application for Payment \_\_\_\_\_
- w/Final Statement of Accounts \_\_\_\_\_
- Punch List (checked off) \_\_\_\_\_
- O & M Manuals (Date Submitted) \_\_\_\_\_
- Record Drawings (Date Submitted) \_\_\_\_\_
- Spare Parts Lists \_\_\_\_\_
- Receipt for Material \_\_\_\_\_
- (Spare Parts) Delivered \_\_\_\_\_
- To Owner \_\_\_\_\_
- Clear L & P Certificate \_\_\_\_\_
- Warranties & Bonds \_\_\_\_\_
- Consent of Surety to Final Payment \_\_\_\_\_
- Letter from Contractor stating \_\_\_\_\_
- warranty of the Work for \_\_\_\_\_
- one year following date of \_\_\_\_\_
- Substantial Completion \_\_\_\_\_
- Verification of Bond to Remain in \_\_\_\_\_
- effect for one year from Final \_\_\_\_\_
- Payment \_\_\_\_\_

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## SECTION 01153 - CHANGE ORDER PROCEDURES

### PART 1 - GENERAL

#### 1.01 REQUIREMENTS

- A. The Contractor shall promptly implement Change Order procedures as follows:
  - 1. The Contractor shall provide full written data required to evaluate changes.
  - 2. The Contractor shall maintain detailed records of work done on a time and material basis.
  - 3. The Contractor shall provide full documentation to Engineer.
- B. The Contractor shall designate in writing, and submit to the Engineer, the member of Contractor's organization as follows:
  - 1. Person authorized to accept changes in the Work.
  - 2. Person responsible for informing others in the Contractor's employ of the authorization of changes in the Work.
- C. The Owner will designate in writing the person authorized to execute Change Orders.

#### 1.02 RELATED REQUIREMENTS

- A. Conditions of the Contract are included in the Agreement, General Conditions and Supplementary Conditions, including the following:
  - 1. Methods of determining cost or credit to Owner resulting from changes in Work made on a time and material basis.
  - 2. Contractor's claims for additional costs.

#### 1.03 DEFINITIONS

- A. Change Order: See General Conditions of the Contract.
- B. Work Directive Change: A written order to the Contractor, signed by the Owner and the Engineer, which amends the Contract Documents as described and authorizes Contractor to proceed with a change which affects the Contract Sum or the Contract Time, for inclusion in a subsequent Change Order.
- C. Field Order: A written order to the Contractor signed by the Engineer and the Contractor, which is issued to interpret/clarify the Contract Documents, order

minor changes in the work, and/or memorialize trade-off agreements. The Work described by a Field Order shall be accomplished without change to the Contract Sum, Contract Time, and without claims for other costs.

#### 1.04 PRELIMINARY PROCEDURES

A. The Owner or the Engineer may initiate changes by submitting a Request for Proposal (RFP) to the Contractor. Request will include:

1. Detailed description of the Change, Products and location of the change in the Project.
2. Supplementary or revised Drawings and Specifications.
3. The projected time span for making the change and a specific statement as to whether overtime work is, or is not, authorized.
4. A specific period of time during which the requested price will be considered valid.
5. Such request is for information only and is not an instruction to execute the changes, or to stop work in progress.

B. The Contractor may initiate changes by submitting a written Proposal to the Engineer. The Proposal shall include the following:

1. Description of the proposed changes.
2. Statement of the reason for making the changes.
3. Statement of the effect on the Contract Sum and the Contract Time.
4. Statement of the effect on the work of separate contractors.
5. Documentation supporting any change in Contract Sum or Contract Time, as appropriate.

#### 1.05 WORK DIRECTIVE CHANGE AUTHORIZATION

A. In lieu of a Request for Proposal (RFP), the Engineer may issue a Work Directive Change Authorization for the Contractor to proceed with a change for subsequent inclusion in a Change Order.

B. Authorization will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change and will designate the method of determining any change in the Contract Sum and any change in Contract Time.

C. The Owner and the Engineer will sign and date the Work Directive Change Authorization as authorization for the Contractor to proceed with the changes.

D. The Contractor shall sign and date the Work Directive Change Authorization to indicate agreement with the terms therein.

#### 1.06 DOCUMENTATION OF PROPOSALS AND CLAIMS

A. The Contractor shall support each quotation for a lump sum proposal and for each unit price, which has not previously been established, with sufficient substantiating data to allow Engineer to evaluate the quotation.

B. The Contractor shall provide additional data to support time and cost computations as follows:

1. Labor required.
2. Equipment required.
3. Products required.
  - a. Recommended source of purchase and unit cost.
  - b. Quantities required.
4. Taxes, insurance, and bonds.
5. Credit for work deleted from Contract, similarly documented.
6. Overhead and profit.
7. Justification for any change in Contract Time.

C. The Contractor shall support each claim for additional costs and for work done on a time and material basis, with documentation as required for a lump sum proposal, plus additional information as follows:

1. Name of the Owner's authorized agent who ordered the work and date of the order.
2. Dates and times work was performed, and by whom.
3. Time record, summary of hours worked, and hourly rates paid.
4. Receipts and invoices for:
  - a. Equipment used, listing dates and times of use.
  - b. Products used, listing of quantities.
  - c. Subcontracts (The Contractor shall also provide full documentation supporting the subcontract amount).

#### 1.07 PREPARATION OF CHANGE ORDERS AND FIELD ORDERS

A. Engineer will prepare Change Orders and Field Orders.

B. The Change Order will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change.

- C. The Change Order will provide an accounting of the adjustment in the Contract Sum and in the Contract Time.
- D. The Field Order will describe interpretations or clarifications of Contract Documents, order minor changes in the Work, and/or memorialize trade-off agreements.
- E. Field Order work shall be accomplished without change in the Contract Sum, Contract Time, and/or claims for other costs.
- F. Change Order and Field Order forms for Owner will be provided by the Engineer. The Contractor shall provide the Change Orders and Field Orders on correct forms as provided.

#### 1.08 LUMP SUM CHANGE ORDER PROCEDURE

- A. Content of Change Orders will be based on, either:
  - 1. The Engineer's RFP and the Contractor's responsive Proposal as mutually agreed between the Owner and the Contractor.
  - 2. The Contractor's Proposal for a change, as recommended by the Engineer.
- B. The Owner and the Engineer will sign and date the Change Order as authorization for the Contractor to proceed with the changes.
- C. The Contractor shall sign and date the Change Order to indicate agreement with the terms therein.

#### 1.09 WORK DIRECTIVE CHANGE AUTHORIZATION PROCEDURE

- A. The Engineer and the Owner may issue a Work Directive Change Authorization directing the Contractor to proceed with the changes.
- B. At completion of the change, the Contractor shall submit itemized accounting and supporting data as provided herein.
- C. The Engineer will determine the allowable cost of such work, as provided in General Conditions and Supplementary Conditions.
- D. The Engineer will sign and date the Change Order to establish the change in the Contract Price and in the Contract Time.
- E. The Contractor shall sign and date the Change Order to indicate agreement therewith.

- F. The Owner will sign and date the Change Order to indicate agreement therewith.
- G. All time and material Work shall be documented and approved by the Project Representative on a daily basis.

1.10 CORRELATION WITH CONTRACTOR'S SUBMITTALS

- A. The Contractor shall periodically revise the Schedule of Values and Request for Payment forms to record each change as a separate item of Work, and to record the adjusted Contract Sum.
- B. The Contractor shall periodically revise the Construction Schedule to reflect each change in Contract Time.
  - 1. The Contractor shall revise subcontractor schedules to show changes for other items of work affected by the changes.
- C. Upon completion of work under a Change Order, the Contractor shall enter pertinent changes in Record Documents.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

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## SECTION 01200 - PROJECT MEETINGS

### PART 1 - GENERAL

#### 1.01 REQUIREMENTS INCLUDED

- A. The Engineer will schedule and administer a preconstruction meeting, construction progress meetings, and specially called meetings throughout the progress of the work. The Engineer will:
  - 1. Prepare agenda for meetings.
  - 2. Make physical arrangements for meetings.
  - 3. Preside at meetings.
  - 4. Record notes; including significant proceedings and decisions.
  - 5. Reproduce and distribute copies of minutes.
- B. The Contractor shall attend all meetings. When appropriate, the Contractor shall require subcontractors and suppliers to attend. Those in attendance shall be qualified and authorized to act on behalf of the entity each represents.
- C. The Contractor shall attend and identify at the meetings the actual status of the Contract Work. When the Work is not being performed consistently with the Contract Documents and construction schedules, the Contractor shall identify at the meetings the steps being taken to resolve the inconsistency.
- D. The Contractor shall provide all required documentation including Construction Schedule and required updates to Construction Schedule in accordance with Section 01311 – Construction Schedules.

#### 1.02 PRE-CONSTRUCTION MEETING

- A. The Contractor shall participate in a preconstruction meeting to be held after the effective date of the Agreement and prior to the date of Notice to Proceed.
- B. The following shall be in attendance:
  - 1. The Owner's Representative and other staff as appropriate.
  - 2. The Engineer's Representative.
  - 3. The Resident Project Representative.
  - 4. The Contractor's Project Manager
  - 5. The Contractor's Construction Superintendent.
  - 6. Subcontractors as appropriate.
  - 7. Suppliers as appropriate.
  - 8. Utility representatives as appropriate.
  - 9. Others as appropriate.

- C. The Contractor shall supply sufficient copies of the following documents:
  - 1. Construction Schedule.
  - 2. Schedule of Values.
  - 3. List of Subcontractors.
  - 4. List of Suppliers.
  - 5. Schedule of Submittals.
  
- D. The following matters shall be addressed:
  - 1. Distribution and discussion of:
    - a. Project Construction Schedule.
    - b. Schedule of Values.
    - c. List of Subcontractors.
    - d. List of Suppliers.
    - e. Schedule of Submittals.
  - 2. Critical work sequencing.
  - 3. Project Coordination.
  - 4. Designation of responsible personnel.
  - 5. Procedures and processing of:
    - a. Applications for Payment.
    - b. Submittals.
    - c. Field decisions.
    - d. Proposal requests.
    - e. Change Orders.
  - 6. Procedures for maintaining Record Documents.
  - 7. Use of premises:
    - a. Contractor's Field Office, work and storage areas.
    - b. Owner's requirements.
  - 8. Construction facilities and controls.
  - 9. Temporary utilities.
  - 10. Housekeeping procedures.
  - 11. Insurance certifications.
  - 12. Liquidated damages for delay.
  - 13. Laboratory testing of material requirements.

14. Notice to Proceed and Final Completion date.

### 1.03 CONSTRUCTION PROGRESS MEETINGS

- A. Construction progress meetings will be held monthly with the first meeting 30 days after the date of Notice to Proceed.
- B. Special construction progress meetings will be held as required by progress of the Work.
- C. The following shall be in attendance:
  - 1. The Owner's Representative and other staff as appropriate.
  - 2. The Engineer and his professional consultants as appropriate.
  - 3. The Contractor's Representative and/or construction Superintendent.
  - 4. Subcontractors as appropriate.
  - 5. Suppliers as appropriate.
  - 6. Others as appropriate.
- D. The following matters shall be addressed:
  - 1. Review of progress during succeeding work period.
  - 2. Revisions to Construction Schedule.
  - 3. Problems which impede Construction Schedule.
  - 4. Field observations, problems, conflicts.
  - 5. Review of off-site fabrication, delivery schedules.
  - 6. Corrective measures and procedures for Construction Schedule.
  - 7. Remaining Submittals.
  - 8. Review of Record Drawings.
  - 9. Payment applications and processing.
  - 10. Maintenance of quality standards.
  - 11. Review proposed changes and Change Orders:
    - a. Effect on Construction Schedule and completion date.
    - b. Effect on other contracts of the Project.
  - 12. Other matters as appropriate.

- E. The Contractor shall be prepared to discuss the above topics and to make commitments for resolving deficiencies.
- F. The Contractor shall provide sufficient copies of the following documents for each meeting:
  - 1. Revised Construction Schedule in accordance with Section 01311.
  - 2. Revised Submittal Schedule.
  - 3. Current Submittal Log in accordance with Section 01340.
  - 4. Updated Record Drawings.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

## SECTION 01300 - SUBMITTALS

### PART 1 - GENERAL

#### 1.01 DESCRIPTION OF REQUIREMENTS

- A. This Section describes the procedures and requirements for submittals of materials, equipment, and other items to be incorporated into the Work, such as shop drawings, product data, and samples. The requirements for administrative submittals are described in other sections.
- B. Additional individual item submittal requirements are specified in the Sections for each item of work.
- C. Definitions. The work-related submittals of this Section, in addition to the definitions of the General Conditions and elsewhere in the Contract Documents, are further categorized for convenience as follows:
  - 1. Shop drawings include specially prepared technical data of all forms including drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements, and similar information not in standard printed form for application to more than one project.
  - 2. Product data includes standard printed information on materials, products, and systems, not specifically prepared for this project, other than the designation of selections from among available choices printed therein.
  - 3. Samples include both fabricated and unfabricated physical examples of materials, products, and units of work, both as complete units and as smaller portions of units of work, either for limited visual inspection or (where indicated) for more detailed testing and analysis.
  - 4. Other non-administrative submittals include warranties, certifications, maintenance agreements, survey data and reports, field measurement data, factory and quality testing reports, record drawings, operating and maintenance manuals, and other items applicable to the Work that are not processed as shop drawings, product data, or samples.

#### 1.02 GENERAL SUBMITTAL REQUIREMENTS

- A. Scheduling. Required administrative submittals shall include submittal requirements and time schedules for coordination and integration of submittal activity with related work.

1. Within ten (10) days after the Notice to Proceed, a schedule shall be submitted to the Engineer for all material and equipment items. For each required item, the date shall be given for intended submission of the drawing to the Engineer for review and the date required for its incorporation into the Work.
- B. Coordination of Submittal Times. The Contractor shall prepare and transmit each submittal to the Engineer sufficiently in advance of performing related work or other applicable activities, such that the installation will not be delayed or improperly sequenced by processing times, including resubmittal if required. Coordinate each submittal with other submittals, testing, purchasing, delivery, and similar sequenced activities. There will be no extension of Contract Time given due to Contractor's failure to transmit submittals to the Engineer sufficiently in advance of the work.
- C. Preparation of Submittals. The Contractor shall provide permanent marking on each submittal to include all of the following items:
1. The date of submittal, and the date(s) of any previous submittal(s).
  2. The project title and number.
  3. The names of:
    - a. Contractor.
    - b. Supplier.
    - c. Manufacturer.
    - d. Subcontractor.
  4. Identification of Specification Section number and equipment tag numbers.
  5. Notification to the Engineer in writing, at the time of submission, of any deviations in the submittal from the requirements of the Contract Documents.
  6. The Contractor's review stamp, signed or initialed, certifying Contractor's review of submittal, and that verification of products required, field dimensions, adjacent construction Work, and coordination of information within the submittal, has been completed and is in accordance with the requirements of the Work and the Contract Documents.
  7. A 4" x 6" minimum blank space for the Engineer's review stamp and review comments.
  8. Identification of revisions on resubmittals.
  9. Field dimensions clearly identified as such.
  10. Relation to adjacent or critical features of the Work.
  11. Applicable standards, such as ASTM or Federal Specification numbers.
  12. Any submittal sheets or drawings showing more items than the particular item under consideration shall have all but the pertinent description of the item for which review is requested crossed out or blanked out. Standard drawing or data sheets with multiple options unmarked will cause the submittal to be returned not reviewed.

- E. Transmittal Form. All submittals shall be accompanied by the Contractor's standard submittal transmittal form. Any submittal not accompanied by such a form, or where all applicable items on the form are not completed, will be returned not reviewed. Submittals received from sources other than the Contractor, such as suppliers or subcontractors, will not be reviewed by the Engineer.
- F. Transmittal Identification. The Contractor shall number transmittals in sequence for each Division and each Section of the Specifications. The Contractor shall identify resubmittals with a letter of the alphabet following the original number, using A for the first resubmittal, B for the second resubmittal, etc.
- G. Resubmittal. The Contractor shall be allowed to make one (1) resubmittal to address the Engineers comments if the original submittal is returned for resubmittal. Any review of subsequent resubmittals will be considered Contractor required engineering services and treated in accordance with the requirements of the specifications. There will be no extension of Contract Time given due to Contractor's failure to adequately address all of the Engineer's comments in the first resubmittal.
- H. Engineer's Review. The Engineer will review the Contractor's submittal, and upon completion will return to the Contractor marked with one of the following designations, with required action by the Contractor:
  - 1. "Reviewed: No Exceptions." No further submission is required by the Contractor for this item.
  - 2. "Reviewed: Exceptions Noted." No further submission is required by the Contractor for this item. The Contractor shall incorporate all of the Engineer's review notes into the Work.
  - 3. "Revise and Resubmit." The Contractor shall incorporate all of the Engineer's review notes into a revised submittal and resubmit, in accordance with Paragraph G. above.
  - 4. "Rejected." The item submitted is not in conformance with the Contract Documents and cannot be used on this project. The Contractor shall provide the item as specified and resubmit in accordance with Paragraph G. above.
  - 5. "Information Only." No further submission is required by the Contractor for this item.
- I. Record Document. After the Engineer's review, if no further submission is required by the Contractor, the reviewed document shall be printed and

maintained by the Contractor as the "Record Document". The Contractor shall not proceed with installation of materials, products, or systems until a copy of the final reviewed document is in possession of the Contractor.

### 1.03 SPECIFIC CATEGORY REQUIREMENTS

- A. Shop Drawings. The Contractor shall provide newly prepared information, on reproducible sheets, with graphic information at accurate scale (except as otherwise indicated), with name of preparer (firm name) indicated. The Contract Drawings shall not be traced or reproduced by any method for use as or in lieu of detail shop drawings. Drawings shall show dimensions and note which are based upon field measurements. Drawings shall identify materials and products and indicate compliance with standards and special coordination requirements. The Contractor shall not allow shop drawing copies without the appropriate final review markings by the Engineer to be used in connection with the Work.
- B. Product Data. The Contractor shall collect all required data into one comprehensive submittal for each unit of work or system, and clearly mark the choices and options applicable to the Work. The Contractor shall include manufacturer's standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements which have been checked, and special coordination requirements. Maintain one (1) set of product data (for each submittal) at project site, available for reference by the Engineer or others.
- C. Samples. The Contractor shall provide samples identical with final condition of proposed materials or products for the work. Range samples shall be included (not less than three (3) units) where unavoidable variations must be expected and shall describe or identify variations between units of each set. The Contractor shall provide a full set of optional samples where the Engineer's selection is required. Information shall be included with each sample to show generic description, source or product name and manufacturer, limitations, and compliance with standards.
  - 1. Submittal. The Contractor shall provide submittal of a single set of samples for the Engineer's review.
  - 2. Quality Control Set. The Contractor shall maintain a final set of samples at the project site, in suitable condition and available for quality control comparisons by the Engineer and the Owner.

### 1.04 SUBMITTAL SCHEDULING

- A. Review Time. Unless otherwise specified, a minimum of fifteen (15) calendar days following receipt of submittals shall be included in the project schedule for the



Engineer's review. A suitable longer period shall be included in the project schedule where the Engineer's review must be delayed for coordination with subsequent submittals due to the Contractor's submittal sequencing.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

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## SECTION 01311 - CONSTRUCTION SCHEDULE

### PART 1 - GENERAL

#### 1.01 REQUIREMENTS INCLUDED

- A. Within ten (10) days after the effective date of the Agreement, the Contractor shall submit to the Engineer for review a preliminary Construction Schedule indicating the starting and completion dates of the various stages of the work.
- B. The Contractor shall submit a revised Construction Schedule monthly with each request for payment.
- C. The Construction Schedule shall be coordinated and updated with all changes including Field Orders, Work Directive Changes, and Change Orders through the completion of the Work.

#### 1.02 FORM OF SCHEDULES

- A. The Contractor shall prepare all schedules in the form of a horizontal bar chart. The chart shall include the following:
  - 1. A separate horizontal bar for each trade or operation.
  - 2. A horizontal time scale: Identify the first workday of each week.
  - 3. Scale and spacing to allow for notations and future revisions.
  - 4. A minimum sheet size of 8-1/2" X 11".
- B. The Construction Schedule shall:
  - 1. Show the complete sequence of construction by activity.
  - 2. Show the dates for the beginning and completion of each major element of construction.
  - 3. Show projected percentage of completion for each item, as of the first day of each month.
- C. A Submittals Schedule for Shop Drawings, Product Data, and Samples, shall be provided and shall include the following:
  - 1. Dates of Contractor's submittals.
  - 2. Dates the submittal items will be required for inclusion in the Work.

#### 1.04 CONSTRUCTION SCHEDULE REVISIONS

- A. Construction Schedule revisions shall indicate the progress of each activity to the date of submission.
- B. Construction Schedule revisions shall show changes occurring since previous submission of schedule to include the following:

1. Major changes in scope.
  2. Activities modified since previous submission.
  3. Revised projections of progress and completion.
  4. Other identifiable changes.
- C. The Contractor shall provide a narrative report as needed to define:
1. Problem areas, anticipated delays, and the impact on the schedule.
  2. Corrective action recommended and its effect.

#### 1.05 SUBMISSIONS

- A. The Contractor shall submit the initial Construction Schedule in accordance with the General Conditions.
1. The Engineer will review and return a review copy within ten (10) days after receipt.
  2. If required, the Contractor shall resubmit within seven (7) days after return of review copy.
- B. The Contractor shall submit a revised Construction Schedule with each application for payment.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**

## SECTION 01370 - SCHEDULE OF VALUES

### PART 1 - GENERAL

#### 1.01 REQUIREMENTS INCLUDED

- A. The Contractor shall submit to the Engineer for review a preliminary Schedule of Values allocated to the various portions of the Work within ten (10) days after bid opening, ten (10) days after the effective date of the Agreement, and at any other time required in the specifications. The Notice to Proceed will not be issued prior to receipt of a Schedule of Values acceptable to the Engineer. Upon request of the Engineer, the Contractor shall provide supporting documentation for substantiating the values used.
- B. The Schedule of Values shall be used as a basis for the Contractor's Applications for Payment. The sum of all values listed in the Schedule shall equal the total Contract Price. General Conditions (mobilization, bonds, insurance, etc.) shall be no more than 5% of the total Contract Price.

#### 1.02 FORM AND CONTENT OF SCHEDULE OF VALUES

- A. The Schedule shall be on minimum 8-1/2 in. x 11 in. white paper. The Contractor's standard form and/or automated printout will be considered for acceptance by the Engineer upon the Contractor's request, provided the standard form includes all of the requirements herein. The Schedule shall be identified as follows:
  - 1. Title of Project and location.
  - 2. Engineer and Project number.
  - 3. Name and Address of Contractor.
  - 4. Date of submission.
- B. The Schedule shall list the installed value of the appropriate component parts for each item of the Work in sufficient detail to serve as a basis for computing values for progress payments during construction. Component Parts shall be defined as any single item with a value of more than \$5,000.00, or defined by separate construction trade, whichever is of less value. The Engineer may direct further break down of additional parts. Component parts shall be identified by Specification Section, where applicable.
- C. The Schedule shall be itemized by each separate structure. For projects with multiple site locations, the Schedule shall be itemized by each separate location.

### 1.03 SCHEDULE OF MAJOR EQUIPMENT ITEM VALUES

- A. Major equipment items, defined as any item with a value of more than \$20,000, shall be subdivided into components to include the following:
  - 1. Preparation and processing of submittal and any required resubmittals.
  - 2. Fabrication and delivery to the Site (subdivided further by equipment items as defined in the equipment list contained in the Specification Section for the equipment).
  - 3. Installation (subdivided further by equipment items as defined in the equipment list contained in the Specification Section for the equipment).
  - 4. Start-up and operator training.
  - 5. Delivery of spare parts, warranties, and Operation & Maintenance Manuals to the Owner.

### 1.04 REQUIRED ITEMS

- A. In addition to the requirements above, the Schedule shall contain separate items as listed below (at a minimum, and as applicable):
  - 1. General Conditions (to include mobilization)
  - 2. Demolition
  - 3. Bypass Pumping
  - 4. Paving
  - 5. Coatings
  - 6. Mechanical Equipment
  - 7. Piping
  - 8. Electrical Equipment
  - 9. Electrical Work
  - 10. Site Restoration
  - 11. Submission of Record Documents

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

## SECTION 01380 – CONSTRUCTION PHOTOGRAPHS

### PART 1 - GENERAL

#### 1.01 SCOPE OF WORK

- A. The Contractor shall employ a competent photographer to take construction record photographs prior to and periodically during the course of the Work.
- B. Progress payments will not be processed unless photographs are included and current with construction progress.

#### 1.02 SUBMITTALS

- A. The Contractor shall provide at least six (6) photographs each month of each major portion of the work taken at each major stage of construction. The Contractor shall provide digital files of each photograph identified with project title, description of view and date.

### PART 2 - PRODUCTS

#### 2.01 PRINTS

- A. All prints shall be color as follows:
  - 1. Paper: 20lb Bond Paper.
  - 2. Print Size: 3 ½ in. x 5 in.
  - 3. Each picture shall be date stamped.
  - 3. Prints: 1 column and 2 rows of pictures per sheet.
- B. Each print shall be identified by caption below the picture, listing:
  - 1. Project Subject / Item.
  - 2. Location / Station.
  - 3. Direction of view.

### PART 3 - EXECUTION

#### 3.01 TECHNIQUE FOR STILL PHOTOGRAPHS

- A. Factual presentation.
- B. Correct exposure and focus.
  - 1. High resolution and sharpness.

2. Maximum depth-of-field.
3. Minimum distortion.

### 3.02 VIEWS REQUIRED FOR STILL PHOTOGRAPHS

- A. Contractor shall photograph from locations to adequately illustrate conditions of construction and state of progress.
- B. Prior to construction, at least six photographs of pertinent features shall be taken at various locations at the site and promptly submitted to the Engineer. Additional progress photographs shall be made monthly throughout the progress of the work and of significant milestones items or areas when work has taken place at that location during the month and submitted with each of the Contractor's applications for payment.

### 3.03 DELIVERY OF PHOTOGRAPHS AND PRINTS

- A. Preconstruction photographs shall be delivered to the Engineer prior to the beginning of construction.
- B. Digital photographs shall be of at least 4 megapixels and shall be clear, sharp and encompass depth of field. The photographs shall be submitted as a color printed composite PDF, digital PDF file and original digital camera files on a CD/DVD ROM. Two (2) printed colored PDFs on bond paper and (2) CD/DVD ROMS labeled with the Project Title and date shall be furnished with each set of photographs. All digital photographs taken during construction by the contractor shall be retained, and a copy of all digital files shall be delivered on CD/DVD ROM to the Engineer at the completion of the project or as directed by the Engineer or Project Representative.

**END OF SECTION**



## SECTION 01400 - TESTING LABORATORY

### PART 1-GENERAL

#### 1.01 REQUIREMENTS

- A. The Contractor shall provide the services of an independent testing laboratory to perform specified testing upon recommendation of the Engineer. All samples of the Work will be collected by the testing laboratory. Any equipment, supplies, and delivery services required for testing will be provided by the testing laboratory.
- B. The Contractor shall cooperate with the laboratory to facilitate the execution of the required testing services. Representatives of the testing laboratory shall have access to the work at all times and facilities for such access shall be provided in order that the laboratory may perform its functions properly. The Contractor shall consult the testing laboratory in advance to determine the time required to perform the tests and to issue findings. The testing laboratory shall be notified by the Contractor of any schedule changes.

#### 1.02 CONTRACTOR'S RESPONSIBILITIES

The Contractor shall:

- A. Coordinate with the laboratory to request testing, as directed by the Engineer.
- B. Secure and deliver to the laboratory, when requested by Engineer, adequate quantities of representational samples of materials proposed to be used and which require testing.
- C. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other materials mixes which require control by the testing laboratory.
- D. Furnish copies of material test reports as required.
- E. Furnish incidental labor and facilities:
  - 1. To provide access to Work to be tested.
  - 2. To facilitate inspections and tests.
  - 3. For field storage and curing of test samples.
- G. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests. When tests or inspections cannot be performed after such notice, reimburse Owner for laboratory personnel and travel expenses incurred due to Contractor's negligence.

- H. Make arrangements with laboratory and pay for additional samples and tests required by failed test results, or for the Contractor's convenience.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

## SECTION 01505 - MOBILIZATION

### PART 1 - GENERAL

#### 1.01 SCOPE OF WORK

The Contractor shall set up necessary construction facilities including storage areas, temporary facilities, Contractor's field offices and such sanitary and other facilities as are required by local or state law or regulation; all as required for the proper performance and completion of the Work.

A. The Contractor shall provide all items of work covered in this Section which shall include but not be limited to the following principal items:

1. Establishment on site of all Contractor's field offices, facilities, and equipment required for the first month of operation.
2. Installation of temporary construction power, wiring, and lighting facilities.
3. Development of construction water supply.
4. Provision of on-site sanitary facilities and potable water facilities as specified.
5. Establishment of Contractor's work and storage yard.
6. Procurement and submittal of all required subcontractor insurance certificates and bonds.
7. Obtaining all required permits.
8. Posting of all OSHA required notices and other information as required by Federal, State and Local Agencies.
9. The Contractor's superintendent established at the job site full time.
10. Provision of a detailed construction schedule acceptable to the Owner for project use as specified.
11. Erection of two project signs as specified.
12. Provision of pre-construction site survey video.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

## **SECTION 01515 - TEMPORARY UTILITIES**

### **PART 1 - GENERAL**

#### **1.01 SCOPE OF WORK**

The Contractor shall provide equipment that is adequate for the performance of the work under this contract within the time specified. All equipment shall be kept in satisfactory operating condition, shall be capable of safely and efficiently performing the required work, and shall be subject to inspection and approval by the Owner's representative at any time within the duration of the Contract. All work hereunder shall conform to the applicable requirements of the OSHA Standards for Construction and shall conform with requirements of the National Electric Code.

### **PART 2 - PRODUCTS (NOT USED)**

### **PART 3 - EXECUTION**

#### **3.01 POWER AND LIGHTING**

- A. **Power:**  
The Contractor shall provide all necessary power required for construction operations under the Contract and shall provide and maintain all temporary power lines required to perform the work in a safe and satisfactory manner.
- B. **Construction Lighting:**  
All work conducted at night or under conditions of deficient daylight shall be suitably lighted to ensure proper work and to afford adequate facilities for inspection and safe working conditions.
- C. **Approval of Electrical Connections:**  
All temporary connections for electricity shall be subject to approval of the Owner and the power company representative and shall be removed in like manner prior to final acceptance at work.
- D. **Separation of Circuits:**  
Lighting circuits shall be separated from power circuits.
- E. **Construction Wiring:**  
All wiring for temporary electric light and power shall be properly installed and maintained and securely fastened in place. All electrical facilities shall conform to the requirements of Subpart K of the OSHA Safety and Health Standards for Construction and shall be subject to approval of the Owner.

### 3.02 WATER SUPPLY

- A. General:  
The Contractor shall provide an adequate supply of water for construction purposes. The Contractor shall pay the water utility for water used at the job site.
  
- B. The Contractor shall provide and operate all pumping facilities, pipelines, valves, hydrants, storage tanks, and all other equipment necessary for the adequate development and operation of the temporary water supply system. The Contractor shall insure the adequate functioning of the temporary water supply system and shall be solely liable for any claims arising from the use of same, including discharge or waste of water therefrom.
  
- C. Potable Water: All drinking water on the site during construction shall be furnished by the Contractor.
  
- D. Water Connections:  
The Contractor shall not make connection to, or draw water from, any fire hydrant or pipeline without first obtaining permission of the authority having jurisdiction over the use of said fire hydrant or pipeline and from the agency owning the affected water system. For each such connection made, the Contractor shall first attach to the fire hydrant or pipeline a backflow preventer, valve, and meter, if required by the said authority, of a size and type acceptable to said authority and agency. Only approved hydrants wrenches may be used to open and close hydrants. In instances where connections are made to water pipelines for the purpose of pressure testing newly constructed force mains or sewers, a double check valve system and pressure gauge shall be utilized to prevent back flow into the water main system.
  
- E. Removal of Water Connections:  
Before final acceptance of the Work on the project, all temporary connections and piping installed by the Contractor shall be entirely removed, and all affected improvements shall be restored to their original condition, or better, to the satisfaction of the Owner and to the agency owning the affected utility.
  
- F. Fire Protection:  
The construction plant and all other parts of the work shall be connected with the Contractor's water supply system and shall be adequately protected against damage by fire. Hose connections and hose, water casks, chemical equipment, or other sufficient means shall be provided for fighting fires in the temporary structures and other portions of the work, and responsible persons shall be designated and instructed in the operation of such fire apparatus so as to prevent or minimize the hazard of fire. The Contractor's fire protection program shall conform to the requirements of Subpart F of the OSHA Standards for Construction.

### 3.03 SANITATION

A. Toilet Facilities:

Fixed or portable chemical toilets shall be provided wherever needed for the use of employees. Toilets at construction job sites shall conform to the requirements of Subpart D, Section 1026.51 of the OSHA Standards for Construction.

B. Sanitary and Other Organic Wastes:

The Contractor shall establish and provide regular collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the Contractor or organic materials wastes from any other source related to the Contractor's operations shall be disposed of away from the site in accordance with all laws and regulations pertaining thereto.

### 3.04 SAFETY

A. Public Safety:

During the performance of the work the Contractor shall erect and maintain temporary fences, bridges, railings, and barriers as necessary for the prevention of accidents. The Contractor shall take all other necessary precautions and place proper guards for the prevention of accidents. The Contractor shall erect and maintain suitable and sufficient lights and other signals.

**END OF SECTION**

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## SECTION 01600 - MATERIALS AND EQUIPMENT

### PART 1 - GENERAL

#### 1.01 REQUIREMENTS

1. All materials and equipment furnished and installed under this contract shall conform to the general stipulations set forth in this Section, except as otherwise specified in other sections of these Specifications. All materials and equipment furnished under this contract shall be submitted to the Engineer for review. The Contractor shall not incorporate into the Work any materials or equipment not submitted for review and accepted by the Engineer.

#### 1.02 WORKMANSHIP

1. The Contractor shall guarantee all equipment against faulty or inadequate design, improper assembly or erection, defective workmanship or materials, and leakage, breakage, or other failure. Materials shall be suitable for service conditions.
2. All equipment shall be new and designed, fabricated, and assembled in accordance with the best modern engineering and shop practice. Individual parts shall be manufactured to standard sizes and gauges so that repair parts furnished at any time, can be installed in the field. Like parts of duplicate units shall be interchangeable. Equipment shall not have been in service at any time prior to delivery, except as required by tests.
3. Except where otherwise specified, structural and miscellaneous fabricated steel used in equipment shall conform to AISC standards. Unless otherwise specified, all steel which will be submerged, all or in part, during normal operation of the equipment shall be at least  $\frac{1}{4}$  inch thick.

#### 1.03 MATERIALS AND EQUIPMENT

1. The Contractor shall be fully responsible for all materials and equipment furnished under this Contract and shall furnish necessary replacements at any time prior to expiration of the Correction Period.
2. The Contractor shall stock additional supplies of materials and equipment as the Contractor deems necessary for timely and efficient execution of this Contract.

### PART 2 - PRODUCTS (NOT USED)

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

## SECTION 01610 - DELIVERY, STORAGE AND HANDLING

### PART 1 - GENERAL

#### 1.01 SCOPE OF WORK

- A. This Section specifies the general requirements for the delivery, handling, storage, and protection for all items required in the construction of the work. Specific requirements, if any, are specified with the related item.

#### 1.02 TRANSPORTATION AND DELIVERY

- A. Items shall be transported and handled in accordance with the manufacturer's instructions and requirements.
- B. The Contractor shall schedule delivery to reduce long term on-site storage prior to installation and/or operation. Equipment shall not be delivered to the site more than three weeks prior to installation without written authorization from the Engineer.
- C. The Contractor shall coordinate delivery with installation to ensure minimum holding time for items that are hazardous, flammable, easily damaged or sensitive to deterioration.
- D. Products shall be delivered to the sites in the manufacturer's original sealed containers or other packing systems, complete with instructions for handling, storing, unpacking, protecting, and installing.
- E. All items delivered to the two (2) sites shall be unloaded and placed in a manner that will not hamper the Owner's normal operation.
  - 1. Willow Wood. Operations/ items that cannot be hindered include the well, associated piping, hydropneumatic tank, generator, control building, transformer, and drainage. Additional operations that must be preserved include those associated with the sewer lift station located on-site. Items shall not be stored within five (5) feet of the existing fence.
  - 2. Ozone Pines. Delivery and storage of materials and equipment shall be confined to the work limits indicated on the plans. The Parish owned building on-site shall remain in operation throughout construction. Access and deliveries shall be made at the "Exclusive Construction Entrance" indicated on the site plan.
- F. The Contractor shall provide all necessary equipment and personnel to unload items delivered to the sites.
- G. The Contractor shall promptly inspect shipment to assure that products comply with requirements, quantities are correct, and items are undamaged. For items furnished by others, the Contractor shall perform inspection in the presence of the

Engineer. The Contractor shall notify the Engineer verbally, and in writing, of any problems.

### 1.03 STORAGE AND PROTECTION

- A. The Contractor shall store and protect products in accordance with the manufacturer's instructions, with seals and labels intact and legible. Storage instructions shall be studied by the Contractor and reviewed with the Engineer. Instructions shall be carefully followed, and a written record kept by the Contractor. The Contractor shall arrange storage to permit access for inspection by the Engineer.
- B. Loose granular materials shall be stored on solid flat surfaces in a well-drained area. The Contractor shall prevent mixing with foreign matter.
- C. Cement and lime shall be stored under a roof and off the ground and shall be kept completely dry at all times. All structural, miscellaneous, and reinforcing steel shall be stored off the ground or otherwise to prevent accumulations of dirt or grease and in a position to prevent accumulations of standing water and to minimize rusting. Beams shall be stored with the webs vertical. Precast concrete shall be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping, or cracking. Brick, block, and similar masonry products shall be handled and stored in a manner to reduce breakage, cracking and spalling to a minimum.
- D. All mechanical and electrical equipment and instruments subject to corrosive damage by the atmosphere if stored outdoors (even though covered by canvas) shall be stored in a weathertight building to prevent injury. The building may be a temporary structure on the site or elsewhere, but it shall be satisfactory to the Engineer. Building shall be provided with adequate ventilation to prevent condensation. The Contractor shall maintain temperature and humidity within range required by manufacturer.
  - 1. All equipment shall be stored fully lubricated with oil, grease and other lubricants unless otherwise instructed by the manufacturer.
  - 2. Moving parts shall be rotated a minimum of once weekly to ensure proper lubrication and to avoid metal-to-metal "welding". Upon installation of the equipment, the Contractor shall start the equipment, at least half load, once weekly for an adequate period of time to ensure that the equipment does not deteriorate from lack of use.
  - 3. Lubricants shall be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. New lubricants shall be put into the equipment at the time of acceptance.
  - 4. Prior to acceptance of the equipment, the Contractor shall require the manufacturer inspect the equipment and certify that its condition has not

been detrimentally affected by the long storage period. Such certifications by the manufacturer shall be deemed to mean that the equipment is judged by the manufacturer to be in a condition equal to that of equipment that has been shipped, installed, tested, and accepted in a minimum time period. As such, the manufacturer will guaranty the equipment equally in both instances. If such certification is not provided, the equipment shall be judged to be defective and shall be removed and replaced.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

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## SECTION 01700 - CONTRACT CLOSEOUT

### PART 1 - GENERAL

#### 1.01 SCOPE OF WORK

- A. The Contractor shall comply with all requirements stated in Contract Documents in closing out the Contract.

#### 1.02 RE-INSPECTION FEES

- A. Should the Engineer perform re-inspections due to failure of the Work to comply with claims of status of completion made by the Contractor the following shall apply:
  - 1. Owner will compensate Engineer for such additional services.
  - 2. Owner will deduct the amount of such compensation from the final payment to the Contractor.

#### 1.03 FINAL SUBMITTALS

- A. No application for final payment will be accepted until all required submittals have been made to the Engineer and processed by the Engineer, including, but not limited to, the following:
  - 1. Consent of Surety to Final Payment as specified in the General and Supplementary Conditions.
  - 2. Affidavit of Final Payment and Release as specified in the General and Supplementary Conditions.
  - 3. Project Record Documents as specified in Section 01720.
  - 4. All submittals required by federal, state, and local regulatory agencies.
  - 5. Record Drawings.

#### 1.04 FINAL ADJUSTMENT OF ACCOUNTS

- A. The Contractor shall submit a final statement of accounting to the Engineer.
- B. The Statement shall reflect all adjustments to the Contract Price as follows:
  - 1. The original Contract Price.
  - 2. Additions and deductions resulting from:
    - a. Previous Change Orders.
    - b. Allowances (if applicable).
    - c. Unit Prices (if applicable).
    - d. Deductions for uncorrected work.

- e. Deductions for liquidated damages.
  - f. Deductions for re-inspection payments.
  - g. Deductions for resubmittal review payments.
  - 3. Total Contract Price, as adjusted.
  - 4. Previous payments.
  - 5. Sum remaining due.
- C. The Engineer will prepare a final Change Order, reflecting approved adjustments to the Contract Price which were not made by previous Change Orders.

#### 1.05 FINAL PAYMENT

- A. The Contractor shall submit the final Application for Payment in accordance with procedures and requirements stated in the General and Supplementary Conditions.
- B. Final payment will be made to the Contractor in accordance with the General and Supplementary Conditions.

#### **PART 2 - PRODUCTS (NOT USED)**

#### **PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**



## **SECTION 01710 - CLEANING**

### **PART 1 - GENERAL**

#### **1.01 SCOPE OF WORK**

- A. The Contractor shall execute cleaning during progress of the Work on a daily basis, and at completion of the Work, as required by the Contract Documents.

#### **1.02 DISPOSAL REQUIREMENTS**

- A. Cleaning and disposal operations shall comply with all local, state, and federal codes, ordinances, regulations, and anti-pollution laws.

### **PART 2-PRODUCTS**

#### **2.01 MATERIALS**

- A. Cleaning materials which will not create hazards to health or property, and which will not damage surfaces shall be used only.
- B. The Contractor shall only use cleaning materials and methods recommended by the manufacturer of the surface material to be cleaned.
- C. The Contractor shall use cleaning materials only on surfaces recommended by cleaning material manufacturer.

### **PART 3-EXECUTION**

#### **3.01 DURING CONSTRUCTION**

- A. Premises shall be kept free from accumulation of waste materials or rubbish caused by Contractor's operations. The Contractor shall oversee cleaning and ensure that building and grounds are maintained free from accumulations of waste material and rubbish.
- B. At reasonable intervals during progress of work, the Contractor shall clean-up site, buildings, and access, and dispose of waste materials, rubbish, and debris. Appropriate containers shall be provided and located on site for collection of waste materials, rubbish, and debris. The Contractor shall not allow waste materials, rubbish, and debris to accumulate and become an unsightly or hazardous condition.
- C. Waste materials shall be transported in a controlled manner with as few handlings as possible. Dusty debris and dusty areas shall be sprinkled with water.

- D. Burning or burying of rubbish and waste materials on the site shall not be performed. Disposal of volatile fluid wastes (such as mineral spirits, oil, or paint thinner) in storm or sanitary sewer systems shall not be performed. The Contractor shall remove waste materials, rubbish and debris from the site and legally dispose of at public or private dumping areas off the Owner's property.
- E. The Contractor shall properly clean up and dispose of any chemicals and materials which may be toxic or hazardous in accordance with all federal, state, and local codes.

### 3.02 DUST CONTROL

- A. The Contractor shall clean interior spaces prior to the start of finish painting and continue cleaning on an as-needed basis until painting is finished.
- B. The Contractor shall schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly coated surfaces.
- C. The Contractor shall broom clean interior building areas when ready to receive finish painting and continue cleaning on an as-needed basis until building is ready for acceptance or occupancy.

### 3.03 FINAL CLEANING

- A. The Contractor shall employ skilled workmen for final cleaning.
- B. The Contractor shall remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels and other foreign materials from interior and exterior surfaces.
- C. The Contractor shall wash and shine glazing and mirrors.
- D. The Contractor shall polish glossy surfaces to a clear shine.
- E. For ventilating systems, the Contractor shall:
  - 1. Clean permanent filters and replace disposable filters if units were operated during construction.
  - 2. Clean ducts, blowers, and coils if units were operated without filters during construction.
- F. The Contractor shall broom clean exterior paved surfaces; rake clean other surfaces of the grounds.
- G. The Contractor shall remove waste materials and rubbish from and about the site as well as tools, construction equipment, machinery and surplus materials.

- H. Prior to final completion, or Owner occupancy, the Contractor shall conduct an inspection of interior and exterior surfaces and all work areas, to verify that the entire site where Work was performed is clean. The Contractor shall clean any areas found to be not clean.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

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## SECTION 01720 - PROJECT RECORD DOCUMENTS

### PART 1 - GENERAL

#### 1.01 SCOPE OF WORK

- A. The Contractor shall maintain at the site at all times during construction one copy of the following Project Record Documents:
  - 1. Conformed Drawings.
  - 2. Conformed Specifications.
  - 3. Change Orders and other modifications to the Contract.
  - 4. Engineer's Field Orders or written instructions.
  - 5. Approved Shop Drawings, Product Data and Samples.
  - 6. Field test records.
  - 7. Construction photographs.
  - 8. Current updated progress schedule.
- B. Progress payments will not be approved unless Project Record Documents are current with construction progress.

#### 1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Documents and samples shall be stored in the Contractor's office apart from documents used for construction.
  - 1. The Contractor shall provide files and racks for storage of documents.
  - 2. The Contractor shall provide locked cabinet or secure storage space for storage of samples.
- B. Documents and samples shall be filed in accordance with specification section numbers.
- C. Documents shall be maintained in a clean, dry, legible condition and in good order. Record Documents shall not be used for construction purposes.
- D. Documents and samples shall be made available at all times for inspection by the Engineer and Owner.

#### 1.03 MARKING DEVICES

- A. The Contractor shall provide felt tip marking pens for recording information in the color codes designated by the Engineer. Record Documents shall be marked accordingly.

## 1.04 RECORDING

- A. Each Record Document shall be labelled "PROJECT RECORD" with rubber stamp.
- B. The Contractor shall record information concurrently with construction progress, and shall not conceal any work until required information is recorded.
- C. Drawings shall be legibly marked to record actual construction, and shall include the following:
  - 1. Locations of all underground pipe and conduits installed.
  - 2. Elevations where applicable for all underground piping installed or located.
  - 3. Locations of all underground utilities, structures, obstacles, etc. encountered during construction, whether being installed or not, in the manner indicated above for underground pipes and conduits.
  - 4. Location of internal utilities and appurtenances concealed in the construction by referencing to visible and accessible features of the structure.
  - 5. Field changes of dimension and detail.
  - 6. Changes made by Field Order or by Change Order.
  - 7. Details not on original Drawings.
  - 8. Location and elevation of all equipment and piping.
  - 9. Location and elevation of all structures including channels and platforms.
  - 10. Identify pumping equipment installed by manufacturer's name, model number, impeller size, rated capacity and serial number.
- D. Specifications shall be legibly marked by each Section to record the following:
  - 1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
  - 2. Changes made by Field Order, Change Order, or other modifications to the Contract.
- F. Reviewed submittals:
  - 1. One set of record drawings for each process equipment item, piping, electrical system and instrumentation system.

G. The Contractor shall provide certified site survey and elevations.

1.05 FINAL SUBMITTAL

A. At Contract closeout, all Record Documents shall be delivered to the Engineer.

B. The submittal shall have a transmittal letter containing the following:

1. Date.
2. Project title and number.
3. Contractor's name and address.
4. Title and number of each Record Document.
5. Signature of Contractor or his authorized representative.

C. Final Acceptance will not be granted until the Record Documents have been turned over and accepted by the Engineer as complete.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

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## SECTION 01730 - OPERATING AND MAINTENANCE DATA

### PART I - GENERAL

#### 1.01 REQUIREMENTS INCLUDED

- A. The Contractor shall compile product data and related information appropriate for Owner's maintenance and operation of products furnished under contract. The Contractor shall prepare operating and maintenance data as specified in this section and as referenced in other pertinent sections of the specifications.
- B. The Contractor shall instruct the Owner's personnel in maintenance of products and in operation of equipment and systems.

#### 1.02 RELATED REQUIREMENTS

- A. Section 01300: Submittals.
- B. Section 01700: Contract Closeout.
- C. Section 01740: Warranties and Bonds.

#### 1.03 FORM OF SUBMITTALS

- A. The Contractor shall prepare data in form of an instructional manual for use by the Owner's personnel.
- B. The format shall be as follows:
  - 1. DVD/ROM.
  - 2. PDFs.
  - 3. Text: Manufacturer's printed data, or typewritten.
  - 4. Drawings: Full size PDFs
  - 5. Fly-leaf for each separate product or each piece of operating equipment.
    - a. Description of product and major component parts of equipment.
    - b. Indexed tabs.
  - 6. Identification of each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS", and the following:
    - a. Title of project.
    - b. Identification of separate structure as applicable.
    - c. Identification of general subject matter covered in the manual.

#### 1.04 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. The Contractor shall submit three (3) copies of complete manual in final form.

B. The manual content, for each unit of equipment and system, shall be as follows:

1. Description of unit and component parts.
  - a. Function, normal operating characteristics, and limiting conditions.
  - b. Performance curves, engineering data and tests.
  - c. Complete nomenclature and commercial number of replaceable parts, which are cross-referenced with manufacturer's parts list.
2. Operating procedures:
  - a. Start-up, break-in, routine, and normal operating instructions.
  - b. Regulation, control, stopping, shutdown, and emergency instructions.
  - c. Summer and winter operating instructions (if applicable).
  - d. Special operating instructions.
3. Maintenance Procedures:
  - a. Routine operations.
  - b. Guide to "trouble-shooting".
  - c. Disassemble, repair, and reassemble.
  - d. Alignment, adjusting and checking.
4. Servicing and lubrication schedule with list of lubricants required.
5. Manufacturer's printed operating and maintenance instructions.
6. Description of sequence of operation by control manufacturer.
7. Original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance.
  - a. Predicted life of parts subject to wear.
  - b. Items recommended to be stocked as spare parts.
8. As-installed control diagrams by controls manufacturer.
9. As-installed color-coded piping diagrams.
10. Charts of valve tag numbers, with location and function of each valve.
11. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
12. Other data as required under pertinent sections of specifications.

C. Content, for each electric and electronic system, as appropriate:

1. Description of system and component parts.
    - a. Function, normal operating characteristics, and limiting conditions.
    - b. Performance curves, engineering data and tests.
    - c. Complete nomenclature and commercial number of replaceable parts.
  2. Circuit directories of panel boards.
    - a. Electrical service.
    - b. Controls.
    - c. Communications.
  3. As-installed color-coded wiring diagrams.
  4. Operating procedures:
    - a. Routine and normal operating instructions.
    - b. Sequences required.
    - c. Special operating instructions.
  5. Maintenance procedures:
    - a. Routine operations.
    - b. Guide to "trouble-shooting".
    - c. Disassembly, repair, and reassembly.
    - d. Adjustment and checking.
  6. Manufacturer's printed operating and maintenance instructions.
  7. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
  8. Other data as required under pertinent sections of specifications.
- D. The Contractor shall Prepare and include additional data when the need for such data becomes apparent during instruction of Owner's personnel.
- E. Additional requirements for operating and maintenance data: Respective sections of specifications.

#### 1.05 SUBMITTAL SCHEDULE

- A. The Contractor shall Submit preliminary draft of proposed formats and outlines of contents for Engineer's review.
- B. The Contractor shall Submit one (1) copy of completed data in final form fifteen days prior to final inspection. Copy will be returned after final inspection with comments.

- C. The Contractor shall Submit specified number of copies of approved data in final form within ten (10) days after final inspection.

1.06 INSTRUCTION OF OWNER'S PERSONNEL

- A. Prior to final inspection or acceptance, the Contractor shall fully instruct the Owner's designated operating and maintenance personnel in operation, adjustment and maintenance of products, equipment, and systems. This shall include a minimum of four (4) hours of training at each site.
- B. Operating and maintenance manual shall constitute the basis of instruction. The Contractor shall review contents of the manual with the Owner's designated operating and maintenance personnel, in full detail, to explain all aspects of operations and maintenance.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

## SECTION 01740 - WARRANTIES AND BONDS

### PART 1 - GENERAL

#### 1.01 REQUIREMENTS INCLUDED

- A. The Contractor shall compile specified warranties and bonds.
- B. The Contractor shall compile specified service and maintenance contracts.
- C. The Contractor shall co-execute submittals when so specified.
- D. The Contractor shall review submittals to verify compliance with Contract Documents.
- E. The Contractor shall submit to Engineer for review and transmittal to owner.

#### 1.02 RELATED REQUIREMENTS

- A. Conditions of the Contract: Performance Bond and Labor and Material Payment Bond.
- B. Conditions of the Contract: General Warranty of Construction.
- C. Section 01700: Contract Closeout.
- D. Section 01730: Operating and Maintenance Data.

#### 1.03 SUBMITTAL REQUIREMENTS

- A. The Contractor shall assemble warranties, bonds, and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors as specified in respective sections of these specifications
- B. Table of Contents: Neatly typed, in orderly sequence. The Contractor shall provide complete information for each item as follows:
  - 1. Product or work item.
  - 2. Firm, with name of principal, address, and telephone number.
  - 3. Scope.
  - 4. Date of beginning of warranty, bond or service and maintenance contract.
  - 5. Duration of warranty, bond, or service maintenance contract.
  - 6. Information for Owner's personnel:
    - a. Proper procedure in case of failure.
    - b. Instances which might affect the validity of warranty or bond.
  - 7. Contractor, with name of responsible principal, address, and telephone number.

#### 1.04 FORM OF SUBMITTALS

##### A. Format:

1. Size 8 ½" x 11" or legal-size sheets.
2. Scanned, original signed PDFs on DVD-ROM with case
3. Cover: Identify each DVD and case with typed or printed title "WARRANTIES AND BONDS". List:
  - a. Title of project.
  - b. Name of Contractor.

#### 1.05 TIME OF SUBMITTALS

- A. The Contractor shall make submittals within ten days after Date of Substantial Completion, prior to final request for payment.
- B. For items of work, where acceptance is delayed materially beyond Date of Substantial Completion, the Contractor shall provide an updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

#### **PART 2 - PRODUCTS (NOT USED)**

#### **PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

## SECTION 02050 - DEMOLITION

### PART 1 - GENERAL

#### 1.01 SCOPE OF WORK

- A. The Contractor shall furnish all labor, materials, equipment, and incidentals required and demolish, modify, alter and convert existing structures and pipelines as required for the construction of the elevated storage tanks as shown on the Drawings and as specified herein.
- B. This Section covers demolition and initial modifications necessary to allow existing operations during the construction phase and final modifications during activation of the improved facility. Included, but not limited to, are demolition, modification and removal of existing materials, equipment or work necessary to install the new work as shown on the Drawings and as specified herein and to connect with existing work in approved manner.
- C. This Section calls attention to certain activities necessary to maintain and facilitate operation during and immediately following construction, and does not purport to cover all of the activities necessary. The Contractor shall exercise due concern for facility operation and diligently direct all activities toward maintaining continuous operation and minimizing operator inconvenience.
- D. Demolition includes:
  - 1. Complete demolition of all existing structures which are encountered in the way of the new work, as shown on the Drawings.
  - 2. Partial demolition as necessary below finished grade of all existing structures which are not in service or required for construction.
  - 3. Temporary modification of structures, equipment, appurtenances and utilities as necessary to allow for operation of the facilities during construction.
  - 4. Removal of existing equipment.
  - 5. Removal or plugging of existing piping.
  - 6. Removing all existing wiring, conduit, switches, junction boxes, pull boxes, panels, outlets, and other electrical devices
  - 7. Distribution of salvageable and excess unacceptable material as specified below.
  - 8. Off-site disposal of excess and unacceptable materials.
- E. Blasting and the use of explosives shall not be used for any demolition work.

#### 1.02 RELATED WORK

- A. Section 02300 - Excavation and Backfill.
- B. Section 03300 - Concrete.
- C. Demolition of electrical material and equipment is included in Division 16.

#### 1.03 SUBMITTALS

- A. The Contractor shall submit to the Engineer, in accordance with Section 01300, proposed methods and operations of demolition of the structures and modifications prior to the start of work. Coordination of shutoff, capping and continuation of utility service as required shall be included.
- B. The Contractor shall furnish a detailed sequence of demolition and removal work to ensure the uninterrupted progress of the Owner's operations.
- C. Before commencing demolition work affecting current facility operation, all modifications necessary to bypass the affected structure shall be completed. Actual work shall not begin until the Engineer has inspected and approved the modifications and authorized commencement of the demolition work in writing.

#### 1.04 CONDITION OF STRUCTURES

- A. The Owner and the Engineer assume no responsibility for the actual condition of the structures to be demolished or modified.
- B. Conditions existing at the time of inspection for bidding purposes will be maintained by the Owner insofar as practicable. However, variations within a structure or on the site may occur prior to the start of demolition work.

#### 1.05 DISPOSAL OF MATERIAL

- A. Where directed by the Engineer, salvageable material and equipment listed hereinafter shall become the property of the Owner. All such items shall be dismantled to a size that can be readily handled and deliver them to a designated storage area.
- B. Designated materials and items of equipment shall remain the property of the Owner and stored where directed on site. Any such material damaged due to improper handling will not be accepted and the replacement value of the material deducted from the payment to the Contractor.
- C. All other material and items of equipment shall become the Contractor's property and shall be removed from the site. The storage or sale of removed items on the site shall not be conducted.



## 1.06 TRAFFIC AND ACCESS

- A. Demolition and modification operations and the removal of equipment and debris shall be conducted to ensure minimum interference with roads, streets, walks both onsite and offsite and to ensure minimum interference with occupied or used facilities.
- B. Special attention shall be directed towards maintaining safe and convenient access to the existing facilities by operational personnel and associated vehicles.
- C. Streets, walks or other occupied or used facilities shall not be closed without written permission from the Engineer. Alternate routes around closed or obstructed traffic in access ways shall be provided.

## 1.07 PROTECTION

- A. The Contractor shall conduct operations to minimize damage by falling debris or other causes to adjacent buildings, structures, roadways and other facilities, including persons. The Contractor shall furnish interior and exterior shoring, bracing, or support to prevent movement or settlement or collapse of structures to be demolished and adjacent facilities to remain.
- B. The Contractor shall exercise precautions for fire prevention. Acceptable fire extinguishers shall be available at all times in areas where demolition work by burning torches is being performed. Burning of demolition debris shall not be permitted onsite or near the site.
- C. The Contractor shall erect and maintain barriers, lights, sidewalk sheds, and other required protective devices.

## 1.08 DAMAGE

- A. The Contractor shall promptly repair damage caused to adjacent facilities by demolition operations as directed by the Engineer and at no additional cost to the Owner. Repairs shall be made to a condition at least equal to that which existed prior to construction.
- B. Where sidewalks, curbs, roadways, drainage inlets or other surface fixtures must be demolished in order to perform work or are damaged during work, they shall be replaced.

## 1.09 UTILITIES

- A. The Contractor shall maintain existing utilities as directed by the Engineer to remain in service and protect against damage during demolition operations.

- B. Existing utilities serving occupied or used facilities shall not be interrupted except when authorized by the Engineer. The Contractor shall provide temporary services during interruptions to existing utilities as acceptable to the Engineer.
- C. The Contractor shall cooperate with the Owner to shut off utilities serving structures of the existing facilities as required by demolition operations.
- D. All necessary arrangements and for performing any necessary work involved in connection with the discontinuance or interruption of all public and private utilities or services under the jurisdiction of the utility companies shall be made by the Contractor.
- E. All utilities being abandoned shall be disconnected and terminated at the service mains in conformance with the requirement of the utility companies or the municipality owning or controlling them.

#### 1.10 NOTIFICATION

- A. At least 48 hours prior to commencement of a demolition or removal, the Engineer shall be notified in writing. Owner shall be allowed to inspect the existing equipment to identify and mark those items which are to remain the property of the Owner. No removals shall be started without the permission of the Engineer.
- B. Prior to any demolition or excavation, the Contractor shall locate all underground utilities.

### **PART 2 - PRODUCTS (NOT USED)**

### **PART 3 - EXECUTION**

#### 3.01 GENERAL

- A. All materials and equipment removed from existing work shall become the property of the Contractor except for those which the Owner has identified and marked. All materials and equipment marked by the Owner to remain shall be carefully removed, so as not to be damaged, cleaned and stored on or adjacent to the site in a protected place specified by the Engineer or loaded onto trucks provided by the Owner.
- B. All demolition materials, equipment, debris and all other items not marked by the Owner to remain shall be properly disposed offsite, in accordance with all applicable laws and regulations. Demolition debris shall not be used for fill or backfill.
- C. Pollution Controls

1. The Contractor shall use water sprinkling, temporary enclosures and other suitable methods to limit the amount of dust and dirt rising and scattered in the air to the lowest practical level. The Contractor shall comply with governing regulations pertaining to environmental protection.
  - a. The Contractor shall not use water when it may create hazardous or objectionable conditions such as flooding or pollution.
  - b. The Contractor shall clean adjacent structures, facilities, and improvements of dust, dirt and debris caused by demolition operations. Adjacent areas shall be returned to conditions existing prior to the start of the work.

### 3.02 REMOVAL OF EXISTING EQUIPMENT, PIPING AND APPURTENANCES

- A. Mechanical removals shall consist of dismantling and removing of existing piping, equipment, and other appurtenances as specified, shown or required for the completion of the work. It shall include cutting, capping and plugging as required.
- B. Existing water, wastewater, and other piping not required for the new work shall be removed where shown on the Drawings, or where it will interfere with the new work. Chemical and gas fuel lines shall be purged and made safe prior to removal or capping.
- C. When underground piping is to be altered or removed, the remaining piping shall be properly capped. Abandoned underground piping may be left in place unless it interferes with new work or is shown or specified to be removed.
- D. All equipment, piping and appurtenances shall be cleaned, flushed and drained. Equipment to be retained by the Owner as specified in Paragraph 1.06 shall be dismantled sufficiently to permit thorough cleaning and draining. All valves shall be left open. All discontinued piping shall be capped and sleeves and openings remaining after removal of the existing equipment, piping and appurtenances shall be plugged and sealed as shown on the Drawings and as directed by the Engineer.
- E. Any changes to potable water piping and other plumbing and heating system work shall be made in conformance with all applicable codes and under the same requirements as other underground piping. All portions of the potable water system that have been altered or opened shall be pressure tested and disinfected in accordance with Louisiana Health Department and AWWA requirements. Other plumbing and heating piping shall be pressure tested only.

### 3.03 DEMOLITION

- A. Demolition shall be performed to the limits shown on the Drawings, or if no limits

are shown, to a depth at least two feet below final grade, or two feet below any new foundation or pipe.

- B. The Contractor shall wet down work during demolition operations to prevent dust from arising. The Contractor shall furnish maximum practicable protection from inclement weather for materials, equipment and personnel located in partially dismantled structures.
- C. Existing, below grade slabs to be abandoned but not demolished shall have sufficient holes cut to allow for positive drainage to prevent flotation.
- D. The Contractor shall remove all existing items as indicated on the Drawings and prepare adjoining areas for installation of new work or for blocking up and filling in of openings.
- E. Structural Demolition
  - 1. Unless otherwise approved by the Engineer, the Contractor shall proceed with demolition from the top of the structure to the ground. The Contractor shall complete demolition work above each floor or tier before disturbing supporting members of lower levels.
  - 2. All mechanical, electrical, piping, and miscellaneous appurtenances shall be removed prior to demolition of the structure.
  - 3. The Contractor shall demolish concrete and masonry in small sections. The Contractor shall remove structural framing members and lower to ground by means of hoist, derricks, or other suitable methods. The Contractor shall break-up and remove foundations and slabs-on-grade, unless otherwise shown to remain. The Contractor shall locate demolition equipment throughout the structure and remove material so as to not impose excessive loads on supporting walls, floors, or framing.
  - 4. The Contractor shall remove structures to the lines and grades shown unless otherwise directed by the Engineer. Where no limits are shown, the limits shall be 4 inches outside the item to be installed. Removal beyond these limits shall be at no additional expense to the Owner, and these excess removals shall be reconstructed to the satisfaction of the Engineer with no additional compensation to the Contractor.
  - 5. All concrete, brick, tile, concrete block, roofing materials, reinforcement, structural or miscellaneous metal, plaster, wire mesh and other items contained in or upon the structure shall be removed and taken from the site, unless otherwise approved by the Engineer. Demolished items shall not be used in backfill adjacent to structures or in pipe line trenches.

6. After removal of parts or all masonry walls, slabs and like work which tie into new work or existing work, the point of junction shall be neatly repaired so as to leave only finished edges and surface exposed.

### 3.04 MISCELLANEOUS CONCRETE SLABS AND SIDEWALKS

- A. The Contractor shall remove miscellaneous concrete slabs and sidewalks where shown on the Drawings or where necessary for the construction of new structures or modification of existing structures.

### 3.05 ELECTRICAL REMOVALS

- A. Electrical removals shall consist of the removal of existing transformers, distribution switchboards, control panels, motors, conduits and wires, poles and overhead wiring, panelboards, lighting fixtures and miscellaneous electrical equipment all as shown on the Drawings, specified herein, or required to perform the work.
- B. All existing electrical equipment and fixtures to be removed shall be removed with such care as may be required to prevent unnecessary damage, to keep existing systems in operation and to maintain the integrity of the grounding systems.
- C. Conduits and wires shall be abandoned or removed where shown or as required.
- D. Wall switches, receptacles, starters and other miscellaneous electrical equipment shall be removed and disposed of off the site as required.

### 3.06 MODIFICATIONS

- A. Modifications to existing structures, piping, tanks, etc. shall be performed as shown on the Drawings or required to perform the construction of the work under this Contract.

### 3.07 CLEAN-UP

- A. Upon completion of the demolition work, all materials, equipment, waste and debris of every sort shall be removed and the premises shall be kept clean, neat, and orderly.

**END OF SECTION**

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## **SECTION 02200 – EARTHWORK**

### **PART 1 – GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract, including General and Supplementary conditions and other Division - 1 Specifications sections, apply to work of this section.

#### **1.2 DESCRIPTION OF WORK**

- A. Extent of earthwork is indicated on drawings.
- B. Layout and scale all lines and levels.
- C. Preparation of suitable subgrade, subbase, and base for the following is included as part of this work:
  - 1. Site improvements including parking areas, drives, and walks.
  - 2. Filling and backfilling to attain indicated grades.
  - 3. Backfilling of trenches within building lines.
  - 4. Preparation of subgrade and subbase for building foundations.
- D. Excavation for Mechanical work is included as part of this work.
- E. The contractor shall furnish all labor, supervision, material, equipment and services necessary for the clearing and stripping, excavation, transportation, grading, compacting of all materials that are not provided for under other section of these specifications including excavation for ditches and channels and all other grading operations necessary for the construction work in accordance with these specifications and in reasonably close conformity with the lines, grades, thicknesses and typical cross sections shown on the plans or established by the Engineer.
- F. It is understood and agreed that the Contractor is familiar with the surface conditions that will be encountered at the site and his price bid for the work includes all of the costs involved for work in these conditions.

#### **1.3 DEFINITIONS**

- A. Subgrade Material: The original or in situ soil encountered and existing after excavation

or under fill.

- B. Subbase Material: The material transported in or moved into the jobsite that sits upon the subgrade below the pavement. The plans will show by section or note the depth of subbase material required.
- C. Base Material: The material transported in or moved into the jobsite that sits upon the subbase and under the pavement. The plans will show by section or note the depth of base material required.
- D. Deleterious Material: The material that would be harmful to the completed foundation. It consists of mixtures of soil and organic material, which will decay or produce unsatisfactory subsidence and may be made up of decaying vegetation, roots, stumps, lots, humus, or other material.
- E. Excavation: Consists of removal of material encountered to subgrade elevations indicated and subsequent disposal of materials removed.

#### **1.4 REFERENCES**

- A. ASTM C 136: Sieve analysis of fine and coarse aggregate
- B. ASTM D 698: Moisture density relations of soils and aggregate mixture using a 5.5 lb. rammer and 12" drop.
- C. ASTM D 1557: Moisture density relations of soils and aggregate mixture using a 10 lb. rammer and 18" drop.

#### **1.5 QUALITY ASSURANCE**

- A. Codes and Standards: Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.
- B. The Contractor shall select and pay for the services of an independent testing laboratory to perform inspection and tests.
- C. The testing laboratory shall test and inspect the earthwork for compliance with these specifications. Any earthwork not meeting the requirements of these specifications shall be replaced.
- D. Contractor is responsible for coordinating these tests.

#### **1.6 TESTS**



- A. Tests and analysis of fill materials will be performed in accordance with ASTM D 698 and ASTM D 1557 and under provisions of Section 01400. Run ASTM D 698 and ASTM D 1557 to determine the optimum moisture and compaction conditions of soils approved for fill.
- B. Perform in-place compaction tests for all fill material. Tests shall be performed for each 6" to 8" layer of fill; one test for each 200 square feet or portion thereof of pavement or other site improvement. Tests shall also be performed at each lift of fill used to backfill the hole after removal of tree stumps with trunk diameters over 24”.

## **1.7 SAMPLES**

- A. Submit samples under provisions of Section 01400 and confirm fill materials meet specifications as to classification.

## **1.8 JOB CONDITIONS**

- A. Existing Utilities: Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation.
- B. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post warning lights.
- C. Operate warning lights as recommended by authorities having jurisdiction.
- D. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operation.
- E. Perform excavation within dripline of large trees to remain by hand and protect the root system from damage or dry out to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with burlap. Paint root cuts of 1" diameter and larger with emulsified asphalt tree paint.

## **PART 2 - PRODUCTS**

### **2.1 SOIL MATERIALS**

- A. Structural Fill Material: Soils that are defined as those complying with ASTM D2487 soil classification groups GW, GP, GM, GC, SW, SP, SM and SC or any combination of these groups, with a liquid limit of 40 or less and a plasticity index of 20 or less and less than 30% of fines passing a #200 sieve in accordance with ASTM C136 free of organics

and rock or gravel larger than 1.5 inches in any dimension, debris, waste, frozen materials, vegetation and other deleterious material. Structural Fill shall have a minimum dry density of 110 pcf.

- B. Unsatisfactory soil materials are defined as those complying with ASTM D 2487 soil classification groups ML, MH, CL, CH, OL, OH, and PT. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction as defined by ASTM D1557.
- C. Structural Fill Material: satisfactory soil materials free of rock, or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious material.
- D. Geotextile Fabric shall meet the requirements of Sections 1019 of the “Louisiana Standard Specification for Roads and Bridges”, 1992 Edition, for Class D Geotextile.

## **PART 3 - EXECUTION**

### **3.1 EXCAVATION**

- A. Excavation is unclassified, and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered such as pavements and other obstructions visible on ground surface; underground structures, utilities and other items indicated to be demolished and removed; together with earth and other materials encountered that are not unauthorized excavation.
- B. Stripping (excavating the topsoil layer at existing grade at the building site, in the parking/drive areas and under other site improvements) includes removal of all vegetation, topsoil, organics, debris and other deleterious materials.
- C. Strip the area under the proposed parking areas/drives, buildings, and an area 1 foot around the perimeter of these areas to a minimum depth below existing grade to remove all vegetation and roots. The Geotechnical Investigation determined that there is 10 – 12 inches of silty topsoil with organics at both sites. Stump holes and depressions should be thoroughly cleaned of loose soil and backfilled with new fill. The site should be proof rolled with loaded dump truck or equivalent to identify weak spots to be removed.
- D. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Engineer. Unauthorized excavation, as well as remedial work directed by Engineer shall be at Contractor's expense.
- E. Backfill and compact unauthorized excavations as specified for authorized excavations of same classification unless otherwise directed by Engineer.

- F. Additional Excavation: When excavation has reached subgrade elevations, notify Engineer who will make an inspection of conditions.
- G. Proof roll the subgrade areas under the proposed structures and drives, parking areas with a tandem axle or similar heavily loaded vehicle weighing about 20 tons. If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material with approved structural fill as directed by Engineer.
- E. For the excavation of additional soil beyond the required subgrade elevations after clearing, grubbing and stripping, the contractor shall provide the Engineer a topographic survey of the top of the subgrade before the additional excavation and after the additional excavation to determine the actual depth of the additional excavation. The points for the topographic survey shall be on a grid not exceeding 10' on center. The contractor shall also provide the Engineer with the horizontal dimensions of the additional excavation. The topographic survey and horizontal measurements will be monitored by the testing laboratory. The Engineer will calculate from the topographic survey and horizontal measurements, the actual in place volume of the additional soil excavated and volume of in-place compacted fill required to backfill the hole.
- F. The construction site including areas of excavation shall be properly prepared to prevent ponding of water and provide immediate runoff of all rainfall and groundwater with proper drainage.
- G. The Contractor's work includes initially grading the site to positively drain away runoff and groundwater from the building, pavement and any other areas of excavation in the construction site including digging sump holes to collect runoff and groundwater or installing wellpoints. Provide and maintain pumps, suction and discharge lines, and other dewatering systems components necessary at wellpoints and sumps to convey water away from excavations at all times. Due to the potential for a perched water table in the surficial soils, ground water may tend to migrate towards ditches and shallow excavations until the surficial soils are drained. It may be necessary for the Contractor to excavate and place interior ditches or swales on close centers to adequately drain the surficial soils under the building footprint and pavement. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations.
- H. The near surface soils are easily rutted by motorized equipment when wet. All clearing, filling and compaction operations should not be done during periods of inclement weather. The area of excavation for stripping the existing grade under the building footprint and pavement shall be limited to the amount that can be backfilled prior to any rainy weather. If an area under the building footprint or pavement is stripped and left exposed in rainy weather, any additional excavation required to remove the wet soil for any reason below the specified subgrade shall be at the Contractor's expense.
- I. Material Storage: Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade, and shape stockpiles for proper drainage.

- J. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.
- K. Dispose of excess soil material and waste materials as herein specified.
- L. Excavation for Structures: Conform to elevations and dimensions which stay within a tolerance of plus or minus 0.10' and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.
- M. Excavation for Pavement and other site improvements: Cut existing grade to cross sections shown on plans and specified herein.
- N. Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F (1 degree C).

### **3.2 COMPACTION:**

- A. General: Control soil compaction during construction providing minimum percentage of density specified for each area classification indicated below.
  - 1. Pavement and other site improvements: Compact loose 6" to 8" lifts of structural fill to 95% of maximum dry density within +/- 2% of optimum moisture content as compared to ASTM D 698. Each lift shall be tested and approved before placing subsequent lifts.
  - 2. Lawn or Unpaved Areas: Compact loose 6" lifts of satisfactory excavated or borrow material by several passes of a bulldozer or other spreading equipment.
- B. Moisture Control: Where subgrade or layer of soil materials must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations.
- C. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
- D. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing until moisture content is reduced to a satisfactory value.

### **3.3 BACKFILL AND FILL**

- A. General: Place acceptable soil material in layers to required subgrade elevations, for

each area classification listed below.

1. Under grassed areas, use satisfactory excavated or borrow material. Suitability of excavated material is to be determined by the Engineer.
  2. Under walks, use Structural Fill Material.
  3. Under concrete pavement use Structural Fill Material.
  4. Under buildings and other site improvements use Structural Fill Material.
  5. Under piping and conduit, use Structural Fill Material where indicated under piping or conduit; shape to fit bottom 180 degrees of cylinder. Limestone is required for bedding or embedment for certain utilities. Refer to other specifications and details on the plans for material specifications and compaction requirements.
- B. Backfill excavations as promptly as work permits, but not until completion of the following:
1. Inspection, testing, approval, and recording locations of underground utilities.
  2. Removal of concrete formwork.
  3. Removal of trash and debris.
- C. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, or break-up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.
- D. Placement and Compaction: Place backfill and fill materials in layers not more than 8" in loose depth for material compacted by heavy compaction equipment, and not more than 4" in loose depth for material compacted by hand-operated tampers.
- E. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to the required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen or contain frost or ice.
- F. Place backfill and fill materials evenly adjacent to structures, piping or conduit to required elevations. Take care to prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping or conduit to approximately same elevation in each lift.

### **3.4 GRADING**

- A. General: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.
- B. Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding.
- C. Finish surfaces free from irregular surface changes, as follows:
  - 1. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 0.10' above or below required subgrade elevations.
  - 2. Walks: Shape surface or areas under walks to line, grade and cross-section, with finished surface not more than 0.10' above or below required subgrade elevation.
  - 3. Parking Areas/Drives: Shape areas to line, grade and cross section with finish surface not more than 0.05 feet above or below required elevations.
- D. Compaction: After grading, compact surfaces to the depth and indicated percentage of maximum or relative density for each area classification.

### **3.5 FIELD QUALITY CONTROL**

- A. Quality control Testing During Construction: Allow testing lab to inspect and approve subgrades and fill layers before further construction work is performed.
- B. The Contractor's representative testing laboratory will perform field density tests in accordance with ASTM D 2922-81 (nuclear density tests). The General Contractor is responsible for coordinating these tests.
- C. If in opinion of Engineer, subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional expense.

### **3.6 MAINTENANCE**

- A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
- B. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
- C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.

### **3.7 DISPOSAL OF EXCESS AND WASTE MATERIALS**

- A. Removal From Owner's Property: Remove waste materials, including unacceptable excavated material, trash, and debris, and dispose of it off Owner's property.

**END OF SECTION**

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## SECTION 02300 - EXCAVATION AND BACKFILL

### PART 1 - GENERAL

#### 1.01 SCOPE OF WORK

- A. The Work under this Section includes, except as provided elsewhere, trenching for installation of pipelines and appurtenances, including excavation, backfilling, disposal of surplus material, and restoration of trench surfaces.
- B. Excavation shall extend to the width and depth shown on the Drawings or as specified; or where not specified, the Contractor shall confine the excavation to the least width practicable and shall provide suitable room for installing pipe, structures, and appurtenances.
- C. The Contractor shall furnish and place all necessary sheeting, bracing, and supports in accordance with OSHA regulations.
- D. The Contractor shall remove from the excavation all materials which are unsuitable for backfill, including that which the Engineer deems unsuitable for backfill.

#### 1.02 RELATED WORK

Section 02140: Dewatering

Section 02160: Sheeting, Shoring, and Bracing

### PART 2 - PRODUCTS

#### 2.01 BACKFILL AND BEDDING MATERIAL

Backfill and bedding material shall be granular material, stone, or an approved blend as shown on the Drawings.

#### 2.02 FOUNDATION MATERIAL

Foundation material shall be as shown on the Drawings.

#### 2.03 GEOTEXTILE FABRIC

Geotextile fabric shall be Mirafi 500X, or approved equal.

## **PART 3 - EXECUTION**

### **3.01 EXCAVATION**

- A. Excavation shall be open cuts with vertical sides using sheeting and bracing as required, all sheeting and bracing for excavations shall be in accordance with OSHA regulations.
- B. The bottom of the excavation shall be firm, dry, and in all respects, acceptable. If required on the Drawings, the Contractor shall install limestone for pipe bedding, or limestone refill for excavation below grade. This material shall be placed directly onto the bottom of the trench immediately after excavation has reached the proper depth and before the bottom of the trench has become softened or disturbed by any cause whatever.
- C. In case the excavation for any pipeline is directed by the Engineer to be carried below the required depth, the Contractor shall fill the bottom of the excavation up to grade with compacted bedding material.
- D. If the Contractor excavates below grade through error or for convenience, or through failure to properly dewater the trench, or disturbs the subgrade before dewatering is sufficiently complete, the Engineer may direct the Contractor to excavate below grade as set forth in the preceding paragraphs; in which case the work of excavating below grade and finishing and placing the refill shall be performed at no additional cost to the Owner.
- E. All material excavated shall be placed so as to minimize interference with public travel and to permit proper access for inspection of the work.

### **3.02 DISPOSAL OF MATERIALS**

- A. Excavated material shall be stacked without excessive surcharge on the trench bank and without obstructing free access to hydrants and valves. Inconvenience to traffic and abutters shall be avoided as much as possible. Excavated material shall be segregated for use in backfilling as specified below.
- B. All excavated material which is either unsuitable for backfill or that will not be used for backfill in the same location shall be removed from the site of the Work by the Contractor. The Contractor shall remove and properly dispose of excess excavated material.
- C. Should conditions make it impracticable or unsafe to stack material adjacent to the trench, the material shall be hauled and stored at a location provided by the Contractor. When required, it shall be rehandled and used in backfilling the trench, or hauled to the Owner's designated storage site, or disposed of properly.

### **3.03 REMOVAL OF STUMPS, ROOTS, AND LOGS**

- A. Stumps, roots, and logs, which are encountered within the trench area, shall be cut to a depth of one foot (1') below the bottom of the trench and removed. The Contractor shall fill the excavated space with compacted bedding material.
- B. When directed by the Engineer, the Contractor shall probe one foot (1') below the established bottom of the trench. If any stumps, roots, or logs are discovered by this probing, the Contractor shall remove them as required in Paragraph A above.
- C. Blasting shall not be used for the removal of stumps, roots, and logs. All removed stumps, roots, and logs shall be disposed of properly.

#### 3.04 TEST PITS

Test pits for the purpose of locating underground utilities or structures in advance of the construction may be excavated by the Contractor. Test pits shall be backfilled immediately after the desired information has been obtained. The backfilled surface shall be restored and maintained in a manner satisfactory to the Engineer. Test pits and related restoration and shall be at no additional cost to the Owner.

#### 3.05 PLACEMENT OF BEDDING MATERIAL

- A. Bedding shall conform to the details on the Drawings. When laying pipe, the groove for the pipe and bell hole shall be accurately shaped, and the bedding material shall be closely packed under and around the pipe.
- B. If required on the Drawings, the bedding and pipe shall be enclosed in a geotextile fabric. Geotextile fabric shall be installed in accordance with the manufacturer's recommendations.

#### 3.06 BACKFILL

- A. As soon as practical after the pipe has been laid and jointed, backfill material (free from stones, pieces of lumber, and other foreign material) shall be hand placed and hand tamped to a depth over the top of the pipe as shown on the Drawings.
- B. Where pipes are laid in developed areas, the trench shall be filled with approved backfill material to an elevation six inches below the existing grade. The remainder of the trench shall be filled with top soil.
- C. Where pipes are laid within street rights-of-ways, the remainder of the trench above the bedding shall be backfilled as shown on the Drawings.
- D. All road surfaces adjacent to backfilling operations shall be broomed and hose cleaned immediately after backfilling.

### 3.07 RESTORING TRENCH SURFACE

- A. The Contractor shall thoroughly consolidate the backfill and shall maintain the surface as the work progresses. If settlement takes place, additional fill shall be installed to restore the level to the adjacent ground.
- B. The surface of any street, driveway, sidewalk or any other area which is disturbed by the trench excavation, shall be restored by the Contractor to a condition at least equal to that existing before work began.
- C. In sections where the pipeline passes through maintained grassed areas, the Contractor shall regrade and re-sod all disturbed areas.

### 3.08 PROTECTION

Guard rails, curbing, and fencing in the vicinity of the Contractor's operations shall be adequately protected and, if necessary, removed and restored after backfilling. All curbing, fencing, or guard rails which are damaged during construction shall be replaced with material fully equal to that existing prior to construction.

**END OF SECTION**

## SECTION 02450 - DRIVEN PILES

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. The work includes providing labor, materials, equipment, and incidentals to install driven sheet piling and structural piles as herein specified and shown on Drawings.

#### 1.02 SUBMITTALS

- A. For each pile type, method of driving, and/or required tip elevation, submit a pile driving plan detailing the following:
  - 1. Method of installation.
  - 2. List of equipment detailing type and size of hammer, leads, jetting equipment, compressors, drilling equipment, cushion, helmet, and any other equipment used in the pile driving process as applicable.
  - 3. Determination of hammer minimum energy.
  - 4. Pile driving sequence.
- 1. Hammer manufacturer's operating manual and compressor data sheets.
- B. Shop drawings shall be provided for all templates and splices.
- C. Mill Test Reports: Submit reports indicating structural strength, destructive and non-destructive test analysis of steel members installed under this section.
- D. Welders' Certificates: Submit certification that welders employed on the work are AWS D1.1 certified.

#### 1.03 SAFETY REQUIREMENTS

- A. Pile driving will cause vibrations that may affect existing residences or underground utilities in the vicinity of the proposed work. Peak particle velocities due to pile driving operation shall be monitored at the locations indicated on the plans with a seismograph during the installation of test piles and job piles. The record of peak particle velocities will provide information in assessing the need for changes in driving operations and types of changes best suited for the project requirements. Monitoring will be performed by an independent testing lab retained by the Contractor. No pile driving shall take place without vibration monitoring on site and in place.
- B. If at any time any monitor in any direction records a reading of 0.20 inches per

second, the laboratory technician shall notify the Contractor and the Owner's representative immediately. The Contractor shall record the activity and location causing the reading. If, at any time, any monitor in any direction records a reading of 0.25 inches per second or greater, the laboratory technician shall notify the Contractor and the Owner's field representative immediately and the affecting construction activity shall be suspended. The Contractor shall propose to the Engineer corrective measures for the affecting construction activity to ensure that vibration -monitoring limits will not be exceeded. Upon approval by the Engineer, the modified construction activity may resume. Repair of any damage caused by the vibrations above safe limits as specified herein shall be the full responsibility of the Contractor.

#### 1.04 DELIVERY, STORAGE, AND HANDLING

- A. Store materials on site to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from erosion and deterioration.

Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

### **PART 2 - MATERIALS**

The materials shall be governed by Sections 803 and 804 of the Louisiana Standard Specifications for Roads and Bridges, latest edition, except as modified by this specification and the Drawings, as applicable.

### **PART 3 - EXECUTION**

- A. Pile installation shall be governed by Section 803 and 804 of the Louisiana Standard Specifications for Roads and Bridges, latest edition, except as modified by this specification and the Drawings.
- B. Pile Load Testing.
- a. Pile capacity shall be verified by Pile Dynamic Analyzer (PDA) on the first production pile at each site. Contractor shall procure and pay costs for instrumentation, monitoring, analysis, and reporting. Report shall bear the seal of a Civil or Structural Engineer licensed in the state of Louisiana.
- b. Piles shall be driven to plan tip elevation, or greater, if predicted capacity of driven pipe fails to reach required capacity at tip elevation, Contractor shall re-tap up to 7 days after initial driving and report capacity, at no additional cost to the Owner. If additional pile depth is ordered by the Engineer, the Contractor shall splice the pile and commence driving, instrumented with PDA, until required capacity is achieved. An equitable adjustment shall be made in price for increased depth.

**END OF SECTION**

## **SECTION 02580 - PIPELINE INSTALLATION AND TESTING**

### **PART 1 - GENERAL**

#### 1.01 Description

- A. The Contractor shall furnish all labor, equipment and materials required to perform all work required for installation of pipelines as indicated on the drawings and specified herein.
- B. The Drawings indicate the alignment of all known pipelines within the limits of the Work, based upon records. The Contractor shall inspect the entire project to verify the location of all existing pipelines and to determine the existence of any conflicts with the Work. The location of proposed pipelines may be field adjusted, with prior approval from the Engineer, to avoid conflicts with other utilities. Damage to any pipelines by the Contractor, subcontractors, material and equipment suppliers or other persons, prior to acceptance, shall be repaired by the Contractor to the satisfaction of the Engineer and Owner at no additional cost to the Owner.

#### 1.02 Construction Layout

The Contractor shall establish all lines and grades and stake out all work on this project from controls shown on the Drawings.

#### 1.03 Related Work

Section 02160 - Sheeting, Shoring, and Bracing  
Section 02300 - Excavation and Backfill  
Section 15042 - Ductile Iron Pipe  
Section 15064 - Plastic Pressure Pipe

### **PART 2 - PRODUCTS**

- 2.03 Identification tape shall be color coded, foil backed with lettering reading “WARNING (or CAUTION) - BURIED WATERLINE (or WASTEWATER) LINE”.

### **PART 3 - EXECUTION**

#### 3.01 General

- A. The installation of pipelines shall be strictly in accordance with these specifications, latest applicable AWWA standards, and the manufacturer’s requirements and recommendations.
- B. Trenching requirements are included in Section 02160 - Sheeting, Shoring and Bracing, and Section 02300 - Excavation and Backfill.

- C. Pipe installation shall be accomplished with pipe sections and fittings such that pipe cutting is held to an absolute minimum. Should pipe cutting be required, cutting shall be done in a neat manner, without damage to the pipe or to the lining. Cuts shall be smooth, straight, and at right angles to the pipe axis. After cutting, the end of the pipe shall be dressed with a file to remove all roughness and sharp corners. All cutting of pipe shall be done with mechanical equipment only. Pipe ends shall be cut with a saw or abrasive wheel. Field cut holes for saddles shall be cut with mechanical pipe cutters.
- D. The interior of all pipe and fittings shall be thoroughly cleaned of foreign matter, and for waterlines, shall be swabbed with chlorine prior to installation and shall be kept clean until the work has been accepted. Swabbing herein shall mean the forceful introduction of a large sponge type device through a pipe to remove debris, such as stones and sand. Before jointing, all joint contact surfaces shall be wire brushed if necessary, wiped clean, and kept clean until jointing is completed. Precautions shall be taken to prevent foreign material from entering the pipe during installation. Debris, tools, clothing, or other materials shall not be placed in or allowed to enter the pipe.
- E. A representative of the Owner shall be present or shall be given the chance to inspect all installed pipe prior to backfill. The Owner may require the Contractor to uncover any or all water distribution system items installed for inspection, at no additional cost to the Owner.

### 3.02 Water System Valves and Hydrants Operation

- A. All existing water distribution system valves and hydrants shall be operated by the Owner. The Contractor shall not operate water system valves or hydrants without prior written permission from the Owner. The Contractor may be allowed to operate water system valves or hydrants without prior written permission only when the Owner's representatives are present at all times during operation, and give specific verbal permission.

### 3.03 Material Handling

- A. Pipes, fittings, couplings, and all other incidentals and accessories shall be handled in a manner that will insure installation in sound, undamaged condition. Equipment, tools, and methods used in handling and installing pipe and fittings shall not damage the pipe and fittings. Hooks inserted in ends of pipe shall have broad, well-padded contact surfaces. When lifting with slings, only wide fabric choker slings capable of safely carrying the load shall be used to lift, move, or lower pipe and fittings. Wire ropes and chains shall not be used. Slings shall be of sufficient capacity for the load, and shall be inspected before use. Worn or damaged equipment shall not be used.
- B. All pipe and fitting coatings which have been damaged shall be repaired by the Contractor before installation. Any such repairs shall be done in total conformance with the manufacturer's requirements and recommendations, shall use approved materials only, and shall be subject to final acceptance by the Engineer.



### 3.05 Connection to Existing Piping

- A. The Owner's representative shall be present during all work being done at the tie-in points. All tie-in locations shall be excavated and existing piping shall be investigated (material type, size, outside diameter, condition, photograph, etc.) prior to ordering material and equipment, and especially prior to the cutting of the existing pipe. Connections between new work and existing piping shall be made using fittings suitable for the conditions encountered and as indicated on the drawings. Each connection to an existing pipe shall be made at a time and under conditions which will least interfere with service to customers, and as authorized by the Owner.
- B. Facilities shall be provided for proper dewatering and for disposal of all water removed from the dewatered lines and excavations without damage to adjacent properties.

### 3.06 Allowable Clearance Between Pipelines

- A. Between Waterlines and Wastewater Lines - When wastewater lines are parallel to waterlines, the clearance shall be a minimum of 10 feet (measured horizontally); when wastewater lines and waterlines cross, vertical clearance shall be 18 inches, with the waterline crossing above the wastewater line.
- B. Between Waterlines and Any Private Utility Lines - Minimum clearance between a waterline and any private utility line shall be 6 feet (measured horizontally).

### 3.07 Pipe Marking

- A. All pipelines shall be installed with buried warning tape. All non-metallic pipelines shall be installed with detector wire.
- B. Warning tape shall be laid in the trench while backfilling, and shall be placed between 12 to 18 inches above the top of the pipe.
- B. Detector wire shall be laid directly over the pipe and shall terminate in valve boxes, meter boxes, or bored or drilled crossings.

### 3.08 Pipeline Pressure Testing

- A. All pipelines shall be pressure tested. The Contractor shall supply all labor, equipment, material, gauges, pumps, and incidentals required for testing.
- B. The test pressure shall be 150 psig for waterlines and 100 psig for sewer force mains, unless noted otherwise. The test pressure shall be measured at the highest point along the test section.
- C. Testing shall be conducted only after backfilling has been completed.
- D. Testing procedure shall be as follows:

- 1) Fill line slowly with water. Maintain flow velocity less than two feet per second.
- 2) Expel air completely from the line during filling and again before applying test pressure. Air shall be expelled by means of taps at points of highest elevation.
- 3) Apply test pressure. Measure the quantity of water that must be pumped into the line to maintain pressure within five (5) psig of the test pressure for a period of two (2) hours. This quantity is defined as leakage.
- 4) Carefully examine any exposed pipe, fittings, and joints for leakage during the test.

E. Allowable leakage: Leakage shall be less than that determined by the following formula:

$$L = \frac{(S)(D)(P)^{1/2}}{133,200}$$

L = Loss in gallons per hour  
 S = Length of pipe tested in feet  
 D = Nominal pipe diameter in inches  
 P = Recorded test pressure in psig

- F. If any test of a pipeline section discloses leakage greater than that allowed, the Contractor shall, at no additional cost to the Owner, locate and repair the cause of leakage and retest the line.
- G. All visible leaks shall be repaired regardless of the amount of leakage.

### 3.09 Waterline Disinfection

- A. Before being placed into service, all new, modified, and/or contaminated segments of the water distribution system shall be cleaned, flushed, and disinfected (chlorinated) by the Contractor under the direct supervision of the Owner. The disinfection of piping shall conform to AWWA C651 "Standard for Disinfection of Water Mains". All disinfection procedures shall be in full compliance with the Louisiana Sanitary Code (Code), Part XII Water Supplies, Chapter 3, Section 353. The procedures to be used, including the chemicals to be used, shall be submitted to the Engineer for approval.
- B. The interior of the piping shall be thoroughly cleaned, flushed, disinfected, flushed, and tested. Flushing shall be done at flow rates sufficient to provide a velocity in the lines of at least 2.5 feet per second.
- C. The Contractor shall arrange for sampling and bacteriological testing to be conducted by the Owner. Water prepared for sampling, and water used for flushing, shall not have a chlorine residual higher than that normally maintained in the water system. The piping shall be cleaned, flushed, disinfected, flushed, and tested as many times as necessary to

achieve a suitable bacteriological test result, at no additional cost to the Owner. No additional Contract Time will be awarded the Contractor for work necessary due to failed bacteriological testing.

- D. Only after satisfactory pressure testing, disinfection, and successful bacteriological test results from the Owner is completed, shall the waterline segment be connected to the existing water distribution system. Under no circumstances shall the Contractor make a connection to the existing water distribution system without direct supervision of the Owner.

### 3.10 Water Usage

- A. Water for flushing, pressure testing, and disinfection may be obtained by the Contractor from the Owner's water system. In order to prevent backflow (back siphon, back pressure) or reversal of the flow of potentially unclean liquids into the drinking water system a separate check valve, as a minimum, shall be used by the Contractor at the point of connection to the Owner's system. A meter shall be used to record the Contractor's water usage.
- B. The Contractor will not be charged for the water used in filling, flushing, testing and chlorinating of pipelines. The Contractor will be charged for any water necessary for retesting due to negligence of the Contractor, and for any water necessary due to failed bacteriological testing.

**END OF SECTION**

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## SECTION 02720 – STORM SEWERAGE

### 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 work specified in this section.

#### 1.2 DESCRIPTION OF WORK

- A. Refer to Division-2 section "Earthwork" for excavation and backfill required for storm sewerage systems piping and structures.

#### 1.3 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacturer of storm sewerage system's products of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.
- B. Installer's Qualifications: Firm with at least 3 years of successful installation experience on projects with storm sewage work similar to that required for project.

#### 1.4 CODES AND STANDARDS

- A. Plumbing Code Compliance: Comply with applicable portions of National Standard Plumbing Code pertaining to selection and installation of storm sewage system's materials and products, and coordinate activities with the local governing authorities Department of Engineering.
- B. Environmental Compliance: Comply with applicable portions of local Environmental Agency regulations pertaining to storm sewerage systems.

#### 1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data and installation instructions for storm sewerage system materials and products.
- B. Shop Drawings: Submit shop drawings for precast concrete storm drainage manholes, drop inlets, and catch basins, including frames, covers, and grates.
- C. Record Drawings: At project closeout, submit record drawings of installed storm sewerage piping and products, in accordance with requirements of Division 1.

- D. Maintenance Data: Submit maintenance data and parts lists for storm sewage system materials and products. Include this data, product data, shop drawings, and record drawings in maintenance manual; in accordance with requirements of Division 1.

## **PART 2 – PRODUCTS**

### **2.1 PIPE AND FITTINGS**

- A. General: Provide pipe and pipe fitting materials compatible with each other. Where more than one type of materials or products is indicated, selection is Installer's option.
- B. Provide shop drawings as submittal for approval by the Engineer. This submittal should comply with the type of pipe as indicated on the drawings.
- C. PVC pipe shall meet the requirements of A.S.T.M. D 3034 with a minimum SDR of 26. All PVC pipe shall be solid wall, corrugated PVC is not allowed.
- D. All fitting and joints should be per manufacturer recommendations for all specified pipe.
- E. Corrugated Metal Pipe: Corrugated metal pipe (CMP) shall be bituminous coated steel pipe – 14 gage minimum in accordance with LADOTD specification 1007.
- F. All reinforced concrete pipe shall be wrapped with plastic filter cloth (D.O.T.D. Specification 1019) 24 inches wide, centered on the joint and lapped a minimum of 24".
- G. Reinforced Concrete Pipe: Reinforced concrete pipe shall conform to ASTM C76, Class 3, with A or B wall thickness, Section 1016.02 of the LADOTD Specifications. Joints shall be Type 3 joints in accordance with LADOTD Specification 1016.01.
- H. Reinforced Concrete Arch Pipe: Reinforced concrete arch pipe shall be Class 3 pipe and shall conform to ASTM C-506 and as amended by LADOTD Specification 1016.03. Joints shall be Type 3 joints in accordance with LADOTD Specification 1016.01.

### **2.2 DROP INLETS AND MANHOLES**

- A. Precast Concrete Catch Basins: ASTM C 478 or ASTM C 858, precast reinforced concrete, of depth indicated. Sections shall have provision for rubber gasket joints. Base section slab shall have minimum thickness of 8 inches, riser sections shall have minimum thickness of 4 inches and be 48 inches inside diameter, and top section and grade rings shall match 24-inch frame and grate, unless otherwise indicated.
1. Base Section: Base riser section and separate base slab, or base riser section with integral floor.
  2. Riser Sections: Sections shall be of lengths to provide depth indicated.

3. Top Section: Flat slab type with opening to match grade rings.
4. Grade Rings: Provide 2 or 3 reinforced concrete rings, of 6 to 9 inches total thickness.
5. Gaskets: ASTM C 443, rubber.
6. Steps: Cast into riser sidewall at 12-to-16-inch intervals.
7. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.
8. Channel and Bench: Concrete.
9. Catch Basin Steps: Wide enough for an adult to place both feet on one step and designed to prevent lateral slippage off the step.
10. Material: Ductile iron or cast aluminum.
11. Catch Basin Frames and Grates: ASTM A 536 Grade 60-40-18, heavy-duty, ductile iron, 24 inch inside diameter by 7-to-9-inch riser with 4-inch minimum width flange, and 26-inch diameter flat grate having small, square or short slotted drainage openings.

### **PART 3 – EXECUTION**

#### **3.1 PREPARATION OF FOUNDATION FOR BURIED STORM SEWERAGE SYSTEMS**

- A. Grade trench bottom to provide a smooth, firm, stable, and rock-free foundation, throughout the length of the pipe.
- B. Remove unstable, soft, and unsuitable materials at the surface upon which pipe bedding is to be installed. Remove all standing, visible water prior to placement of the bedding or embedment material. Install and compact the bedding material to the compaction requirements as indicated on the plans. Backfill with acceptable material as indicated on the drawings to indicated level.
- C. Shape bottom of trench as indicated on the drawings. Fill unevenness with compacted bedding. Dig bell holes at each pipe joint to relieve the bells of all loads and to ensure continuous bearing of the pipe barrel on the foundation material.

#### **3.2 INSTALLATION, GENERAL**

- A. Install piping in accordance with requirements of the local governing authorities Department of Engineering, except where more stringent requirements are indicated.

- B. Inspect piping before installation to detect apparent defects. Mark defective materials with white paint and promptly remove from site.
- C. General Locations and Arrangements: Drawings (plans and details) indicate the general location and arrangement of the underground storm sewerage system piping. Location and arrangement of piping layout take into account many design considerations. Install the piping as indicated, to the extent practical.
- D. Install piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings in accordance with manufacturer's recommendations for use of lubricants, cement, and other installation requirements. Maintain swab or drag in line and pull past each joint as it is completed.
- E. Use manholes or catch basins for changes in direction, except where a fitting is indicated. Use fittings for branch connections, except where direct tap into existing sewer is indicated.
- F. Use proper size increasers, reducers, and couplings, where different size or material of pipes and fittings are connected. Reduction of the size of piping in the direction of the flow is prohibited.
- G. Install piping pitched down in direction of flow at a constant slope between points and elevations indicated, at a minimum slope as indicated.
- H. Tunneling: Install pipe under streets or other obstructions that cannot be disturbed, by tunneling, jacking, or a combination of both.

### 3.3 CATCH BASINS, DROP INLETS AND MANHOLES

- A. General: Construct to sizes and shapes indicated.
- B. Set frames and grates to elevations indicated. If there is a problem due to plan grade requirements, contact the Engineer before installation.
- C. Holes in precast structures to be made with a coring machine.

### 3.4 BACKFILLING

- A. General: Conduct backfilling operations of open-cut trenches closely following layout, jointing, and bedding of pipe, and after initial inspection and testing are completed.
- B. Allow no more than 50' between pipe laying and point of complete backfilling.

### 3.5 FIELD QUALITY CONTROL



- A. Testing: Perform testing of completed piping in accordance with local authorities having jurisdiction.
- B. Cleaning: Clear interior of piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Complete cleaning of the entire drainage system is required before substantial completion.
- C. In large, accessible piping, brushes and brooms may be used for cleaning.
- D. Place plugs in ends of uncompleted pipe at end of day or whenever work stops.
- E. Flush piping between manholes or drop inlets, if required by local authority, to remove collected debris.

### 3.6 INTERIOR INSPECTION

- A. Inspect piping to determine whether line displacement or other damage has occurred.
- B. Make inspections after pipe between manholes, catch basins, or drop inlets and / or their locations has been installed and approximately 2 feet of backfill is in place, and again at completion of project.
- C. If inspection indicates poor alignment, debris, displaced pipe, infiltration, or other defects, correct such defects and reinspect.
- D. Contractor shall provide lights, mirrors, ladders, and all other equipment necessary to completely inspect the interior of the pipeline.

**END OF SECTION**

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## SECTION 02800

### ELEVATED WATER STORAGE TANK

#### PART 1 – GENERAL REQUIREMENT

##### 1.01 SCOPE

- A. The work to be performed under these specifications and this contract consists of the furnishing of all materials, tools, equipment, labor and incidentals necessary for the design, manufacture, delivery, erection, painting, disinfection and testing of two elevated steel, all welded construction, water storage tanks and foundation. Each tank is to be complete with all accessories specified herein and is to be erected on a foundation to be designed and constructed by the Contractor. The tanks shall have capacities as indicated on the drawings. The tank style is welded steel pedestal with flared base supporting spherical tank. The design and construction of the elevated tank shall conform to AWWA D100, Standard for Welded Carbon Steel Tanks for Water Storage, latest edition, except as modified by these specifications and the drawings.
- B. Everything necessary for a complete and usable installation as outlined above and specified herein shall be furnished and installed under this contract whether or not specifically shown or specified.

##### 1.02 REFERENCES

- A. AWWA D100 – Welded Carbon Steel Tanks for Water Storage
- B. AWWA D102 – Coating Steel Water Storage Tanks
- C. AWWA C652 – Disinfection of Water Storage Facilities
- D. AWS (American Welding Society).
- E. NSF (National Sanitation Foundation) 61 – Materials in Contact with Potable Water
- F. Steel Structures Painting Council Manual – Volume 1 – Good Painting Practice
- G. Steel Structures Painting Council Manual – Volume 2 – Systems and Specifications
- H. AISC (American Institute of Steel Construction), latest edition
- I. ACI 318 – Building Code Requirements for Reinforced Concrete
- J. ACI 301 – Standard Specification for Structural Concrete

##### 1.03 RELATED WORK

A. Section 09970 – Coating of Steel Water Storage Tanks

B. Section 15120 – Reservoir Mixer

#### 1.04 QUALIFICATIONS OF MANUFACTURER

A. The Contractor shall be a specialist in the design and construction of elevated steel tanks and shall have built in his own name not less than five (5) comparable elevated storage tanks within the last five years now giving satisfactory service. The Contractor shall have on its staff a full-time professional engineer with not less than five years experience in design and field construction of elevated steel tanks and who will be in responsible engineering charge of the work to be done. The contractor shall not subcontract the design or erection of the steel tank and supporting tower.

#### 1.05 INFORMATION TO BE FURNISHED BY BIDDERS

The apparent low bidder, to be considered responsive, shall submit the following within 10 days of bid opening:

- A. A list of five elevated tanks constructed within the last five years including the Owner, tank capacity, date constructed, and the Engineer, of the same style required herein.
- B. A preliminary drawing of the tank showing major dimensions and plate thickness upon which his bid is based, the high and low water levels and the dimensions of the supporting tower.
- C. A preliminary foundation design drawing showing dimensions and approximate quantities of concrete and reinforcing steel.
- D. Personnel qualifications as required by 1.04A.

#### 1.06 DESIGN PARAMETERS

- A. The structural design of the elevated storage tank shall conform to the following design standards except as modified or clarified:
  - 1. Foundations – AWWA D100, ACI 318, ACI 301
  - 2. Steel Tank – AWWA D100.
  - 3. Steel Tank Painting – AWWA D102.
- B. Loads
  - 1. Seismic Load - Seismic Design shall be performed in accordance with Section 13 of AWWA D100-05. Site Classification: D.
  - 2. Wind Load - Wind pressure shall be determined in accordance with AWWA D100-21, Section 3.1.4. Basic wind speed shall be 130 MPH.

3. Snow Load may be omitted.

C. Foundation

A Geotechnical investigation has been carried out at the site and a copy of the soil boring is included as an Appendix to the Contract Documents. The concrete foundation shall be driven pile supported reinforced concrete mat or driven pile supported reinforced concrete ringwall; and designed by the Contractor in accordance with all applicable codes and standards.

1. Piles shall be steel H-piles.
2. Allowable geotechnical single pile load capacities are as indicated in the appendix. The contractor's structural engineer shall validate that the uplift force relied upon at each pile can be effectively transmitted to the pile.
3. Pile to pile spacing shall not be less than 3 edge dimensions, center to center.

1.07 TANK DETAILS

- A. Capacity: As indicated on the drawings.
- B. Style: Welded steel pedestal with flared base supporting spherical/spheroidal reservoir.
- C. All portions of the tank, including the roof, shall be of water-tight construction and all material shall have a minimum thickness of  $\frac{1}{4}$  inch.

1.08 SUBMITTALS

A. Tank Shop Drawings

After award of the contract, the Contractor shall prepare detailed shop drawings and design calculations for fabrication and erection of the steel work covered by this contract, and plans showing detailed arrangements of anchor bolts, column foundation and dimensions, detail of inlet connections, overflow pipe, piping supports, thrust restraints, ladders, manholes, vents and other specified accessories. These drawings shall be submitted to the Engineer for approval prior to any fabrication of steel. The drawings and calculations shall bear the certification of a professional Civil or Structural Engineer licensed in the State of Louisiana. The design coefficients and resultant loads for steel, water, snow, wind, and seismic forces, and the methods of analysis shall be documented. Electronic submittal is permitted. Once approved, one (1) original sealed version shall be provided.

B. Foundation Shop Drawings

The Contractor shall prepare detailed shop drawings and design calculation for construction of the foundation work covered by this contract showing concrete dimensions, detailed reinforcement size and location; pile layout, length, reinforcing, and pick points for hoisting; and piping foundations. These drawings shall be submitted to the Engineer for approval prior to construction. The drawings and calculations shall bear the certification of a professional Civil or Structural Engineer licensed in the State of Louisiana. Electronic submittal is permitted. Once approved, one (1) original sealed version shall be provided.

- C. Two (2) copies of certified metal test reports shall be provided by the contractor to the Engineer as Evidence that steel materials are new and in compliance with governing specifications.
- D. Construction site operation plan, including haul route, crane location(s), anticipated large equipment to be used, material laydown areas, and other pertinent operational details.
- E. Pile Installation Plan, including driving hammer selection, crane, leads, predrilling plan (if any), and subcontractor information.
- F. Any and all materials, equipment items, or fixtures to be incorporated in the finished product.
- G. Welder qualifications.

## **PART 2 – PRODUCTS**

### **2.01 CONCRETE PILE CAPS**

- A. Reinforced structural concrete and accessories shall be in accordance with the LSSRB, Section 805, Class A.

### **2.02 STEEL – In accordance with AWWA D100, Sec.2.2.**

### **2.03 H-PILES**

- A. Piles shall be structural steel H-piles conforming to the requirements of ASTM A36.
- B. The required length of pile may be fabricated by butt-welding shorter lengths of pile stock. Unless otherwise specified, the cross-section of each pile shall be constant throughout its length. The axis of the pile shall be straight, and the number of welded joints in the length of the pile shall as few as practicable. Pieces below the top piece shall have a minimum length of 10-feet.

### **2.04 COATINGS — Coating systems shall be in accordance with Section 09970.**

## **PART 3 – EXECUTION**

### **3.01 CONCRETE FOUNDATION**

- A. The foundation shall be designed and constructed to safely and permanently support the structure, including the inlet/outlet piping and overflow piping. The concrete foundation shall be constructed in accordance with ACI 301.
- B. Pile Driving: In accordance with Section 804 of the LSSRB, except as modified.
  - 1. After approval of shop drawings, and prior to order of piles, two probe piles (of length sufficient to exceed 50' embedment) shall be driven to verify tabulated capacity at design embedment. In place capacity will be predicted through use of PDA (dynamic analysis) during probe pile installation and assumed embedment depth will be confirmed or extended as necessary to meet the design value. PDA instrumentation, monitoring, and report sealed by licensed Engineer in the State of Louisiana shall be provided by the Contractor.
  - 2. The probe piles may be used as production piles if the required capacity is reached.
  - 3. Pre-drilling to 85% of pile diameter is permitted.
  - 4. Pile driving hammer shall be selected using a wave equation (WEAP) analysis, appropriate to minimize possible damage to the pile. Maximum driving criteria (in blows/foot) shall be established by the contractor prior to mobilization.

### **3.02 STEEL TANK CONSTRUCTION**

#### **A. General**

The erection of the steel tank shall comply with the requirements of Section 10 of AWWA D100 except as modified by these documents.

#### **B. Welding**

- 1. All shop and field welding shall conform to AWS and AWWA D100, Section 10. Before any welding is performed, the constructor shall make certain that the welders or welding operations have their credentials for acceptance and have qualified within the previous year. Qualifications of welders shall be in accordance with ASME Section IX or ANSI / AWS B2.1.
- 2. Weather Conditions – Welding shall not be performed when the surfaces of the parts to be welded are wet from rain, snow, or ice, when rain or snow is falling on such surfaces, or during periods of high winds unless the welder or welding operator and work are properly protected. Welding shall not be done when the base metal temperature is less than 32 degrees F. The base metal within three (3) inches of the place where welding is to be started shall be heated to a temperature warm to the hand during low ambient temperature periods.
- 3. Field Inspection – The Contractor shall furnish field welding inspection results in reports to the Engineer in accordance with AWWA D100, latest revision, and the

cost of providing these tests shall be included in the contract price. Copies of all tests shall be submitted to the Engineer promptly.

4. Testing for both shop and field welds shall be in accordance with AWWA D100, Section 11, Inspection and Testing. All testing shall be performed prior to interior and exterior field painting. The testing shall be performed by an independent testing agency with all costs included in the Contractor's bid and paid by the Contractor.

C. Fabrication

All fabrication and shop assembly shall conform to the requirements of AWWA D100, Section 9, Shop Fabrication.

D. Erection

Plates subjected to stress by the weight or pressure of the contained liquid shall be assembled and welded in such a manner that the proper curvature of the plates in both directions is maintained. Plates shall be assembled and welded together by a procedure that will result in a minimum of distortion for weld shrinkage.

E. Roof Lap Joints

All interior lap joints shall be sealed by means of continuous seal welding. This shall include penetrations of roof accessories.

### 3.03 ACCESSORIES

A. General

The following accessories shall be provided in accordance with these specifications. All items shall be in full conformity with the current applicable OSHA safety regulations and the operating requirements of the structure.

1. Ladders

Ladder side rails shall be a minimum 3/8 inch by 2 inches with a 16-inch clear spacing. Rungs shall not be less than 3/4-inch, round or square, spaced at 12-inch centers. The surface of the rungs shall be knurled, dimpled, or otherwise treated to minimize slipping. At platforms or landings, the ladder shall extend a minimum of 4 feet above the platform. Ladders shall be secured to adjacent structures by brackets located at intervals not exceeding 10 feet. Brackets shall be of sufficient length to provide a minimum distance of 7 inches from the center of the rung to the nearest permanent object behind the ladder. Access ladders shall be provided at the following locations:

- a. Ground to upper platform.
- b. Upper platform to pedestal roof platform.
- c. Pedestal roof platform to roof manway.



d. Tank roof manway to the tank floor, mounted to the pedestal access tube.

2. Fall Protection

Ladders shall be equipped with a fall arrest system meeting OSHA regulations. The system shall be supplied complete with safety harnesses, locking mechanisms, lanyards and accessories for two persons.

3. Upper Platform

An upper platform shall be located at the top of the support pedestal to provide access from the pedestal ladder to the roof access ladder located on the interior of the access tube. Platform shall include a 24" x 36" access hatch with opening to allow ladder and safety device to continue 48" minimum above the platform floor.

4. Condensate Ceiling

Steel condensate ceiling located at the junction of the pedestal shaft and base cone complete with drain and 24" x 36" access hatch with opening to allow ladder and safety device to continue 48" minimum above the platform floor.

5. Openings

a. Roof Hatches

- i. Provide two access hatches on the roof of the tank. One hatch shall be 30-inch diameter and allow access from the roof to the interior of the tank. The hatch will be hinged and equipped with a hasp for locking. The hatch cover shall have a 2-inch downward edge. The second hatch will be 24-inch diameter and flanged with a removable cover so constructed that an exhaust fan may be connected for ventilation during painting operations. The openings shall have a minimum 4-inch curb.
- ii. Provide one 30-inch diameter hinged access hatch on the access tube roof. The hatch cover shall have a 2-inch downward edge.
- iii. Hatch openings shall be located, and hatches shall be designed for one hand operation from the ladder below and allow ingress/egress without lean or hang away from the ladder.

b. Tank Vent

The tank vent should be centrally located on the tank roof above the maximum weir crest elevation. The tank vent shall have an intake and relief capacity sufficiently large that excessive pressure or vacuum will not be developed during maximum flow rate. Maximum flow rate should be based on a break in the inlet/outlet pipe when the tank is full. The vent shall be designed, constructed, and screened so as to prevent the ingress of wind driven debris, insects, birds and animals. The vent should be designed to

operate when frosted over or otherwise clogged. The screens or relief material shall not be damaged by the occurrence and shall return automatically to operating position after the blockage is cleared. Vent body shall be aluminum, vent screen shall be #4 mesh, 316 stainless steel.

c. Tank Floor Manhole

A minimum 18 inch by 24-inch elliptical access manhole shall be provided in the tank bottom accessible from the upper platform or from a ladder that extends from the platform to the opening. The hatch shall open inward.

d. Pedestal Hatch

A 24" diameter manhole shall be located near the top of the pedestal for access to the exterior painter's rail located near the tank/pedestal interface. This opening shall be accessible from the upper pedestal platform.

6. Access Tube

A minimum 42" diameter access tube shall be provided from the top of the pedestal to the tank roof.

7. Rigging

Interior and exterior rigging devices shall be provided for painting, inspecting and maintaining the structure and accessories. A continuous bar or tee rail near the top of the exterior support structure shall be provided. The rail may be attached to the support column or steel tank. A painter's rail attached to the roof, pipe couplings with plugs in the roof or other attachments that provide complete access for painting of tank interior shall be furnished. Continuous rails shall be welded continuously so as not to leave crevices. Skip welds are prohibited.

8. Piping

a. General

Exterior of pipes exposed to stored water shall be coated with tank interior wet system. Exterior of pipes in the pedestal and base cone shall be coated with tank interior dry system.

b. Inlet/Outlet Piping

Provide a standard weight steel inlet/outlet pipe that extends vertically from the base of the pedestal to the bottom of the tank and exits the foundation as shown on the drawings. Expansion joints shall be provided in the vertical section of pipe as required. The expansion joint should be constructed to accommodate any differential movement caused by settlement or thermal expansion and contraction. Inlet/Outlet pipe shall not extend above the LWL.

c. Overflow

The steel overflow pipe shall be 8-inch diameter and shall have a minimum wall thickness of 1/4". A suitable weir shall be provided with the crest at High Water Level. The overflow pipe shall extend down from the weir box through the tank, pedestal, and base cone. The overflow pipe shall penetrate the base cone wall approximately 1 to 2 feet above grade and discharge onto a concrete splash pad. An 8-inch diameter pipe with gate valve shall connect the inlet/outlet pipe and overflow pipe at ground level. The overflow point of discharge shall have a 45-degree elbow and be equipped with a stainless-steel screened end.

9. Interior Floor

A concrete slab-on-grade shall be provided inside the base cone. The floor shall be a minimum of 6 inches thick and reinforced with 6x6/W2.9 x W2.9 WWF. Isolation joints shall be provided at junctions with walls, columns, equipment, or piping foundations.

10. Personnel Door

A 36" by 80" access door with a flush threshold shall be located in the base of the pedestal cone. A step-over threshold is not acceptable. The door shall be fabricated from steel plate with adequate stiffening and specifically designed for use with the tank. The access door will be equipped with handle, drip cover and dead bolt lock. Commercial hollow metal doors and frames are not acceptable.

11. Identification Plate

A tank identification plate shall be mounted near the personnel door. The identification plate shall be corrosion resistant and contain the following information.

- a. Tank Contractor
- b. Contractor's project or file number
- c. Tank capacity
- d. Height to High Water Level
- e. Date erected.

12. Instrumentation

Provide raceways or other intermittent support sufficient to secure conduits, piping, and wiring shown on the drawings and specified elsewhere.

13. Obstruction Light

The obstruction light shall be as indicated on the electrical plans.

14. Interior Lighting

Provide interior lighting shall be as indicated on the electrical plans.

15. Sample tap and drain.

Provide sample tap from inlet/outlet pipe in the base of the tank, with ball valve, and spigot discharging to free-standing stainless-steel utility sink installed to the interior concrete slab, draining directly to the floor drain.

16. Mixer Support.

Provide no less than four (4) steel padeyes within the tank for suspension/anchorage of mixer. Provide stainless steel chains. Coordinate with mixer manufacturer.

3.04 TANK SIGN

The tank sign shall be as directed by the Owner and shall be provided two (2) times on the tank.

3.05 GROUTING COLUMN AND RISER BASE

After the tank has been completely erected and trued up, any space which may exist between column and riser base and foundations shall be thoroughly wetted and filled with a 1:1 cement-sand grout forced under the base plates and filling the space completely.

3.06 TESTS AFTER COMPLETION

After the erection is complete and before the tank is painted, the tank shall be filled with water from the Parish system and the Contractor shall thoroughly check for any leaks. If leaks are found, they shall be repaired by drilling, chipping, or gas-gouging out any defective welds and re-welding. No repair work shall be done on any joint unless the water in the tank is at least two (2) feet below the point being repaired. The coating shall be repaired in accordance with coating manufacturer's recommendation, and inspected by the Owner's independent auditor, at the Contractor's expense.

3.07 DISINFECTION OF ELEVATED WATER TANK

A. The tank shall be completely painted, including lettering, and disinfected before it is placed in service. The interior of the structure and riser shall be thoroughly hand-washed and disinfected in accordance with Method 2, AWWA C652, "Disinfection of Water Storage Facilities". The Contractor shall arrange for samples of water in the tank to be taken by the Parish, for examination by the State Board of Health Laboratory. Less than one coliform bacteria per 100 ml sample and not confluent growth shall constitute a satisfactory sample. A satisfactory sample for the tank is necessary before the contractor is released from his responsibility of fulfilling his contract. The tank shall be disinfected as many times as necessary in order to meet the requirements of the specifications in this regard. Water being collected for testing shall not have chlorine residual higher than that normally maintained in the water system. No chlorine should be present as a result of disinfection.

B. Willow Wood. Water will be available at the Willow Wood site to complete testing and disinfection immediately following tank construction.

- C. Ozone Pines. Water will not be available at the Ozone Pines site to complete testing and disinfection when the tank construction is complete. The completion of the well is expected to be 6-8 months following the completion of the tank.

### 3.08 GUARANTEE

- A. The tank Contractor shall guarantee its work for a period of one year from the final completion date defined in the contract documents to the extent that it will repair any defects caused by faulty design, workmanship or material furnished under the specifications. If Contractor is not advised of any defects within 30 days of end of guarantee period, guarantee shall be considered fulfilled and complete. Defects caused by damaging service conditions such as electrolytic, chemical, abrasive, or other damaging service conditions are not covered by this guarantee.
- B. Faulty design resulting in a structural deficiency that violates the referenced design standards or poses a hazard to adjacent property shall be corrected by the contractor at no additional pay within a period of five years, in accordance with the Louisiana Revised Statutes. If Contractor is not advised of any defects as described in this paragraph prior to the five-year anniversary of final completion, the obligation shall be considered fulfilled and complete.
- C. All guarantees obtained by the tank Contractor from the manufacturer or installer of paint, equipment or accessories not manufactured by tank Contractor shall be obtained for the benefit of the Purchaser.

## **PART 4 – MEASUREMENT AND PAYMENT**

- 4.01 See Section 01025 – Measurement and Payment.
- 4.02 Steel procured by Contractor shall become eligible for payment as Stored Material upon delivery to fabrication facility.

**\*\* END OF SECTION \*\***

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## SECTION 02920 – SEEDING AND SODDING

### PART 1 - GENERAL

#### 1.01 REQUIREMENT

- A. The Contractor shall provide all labor, materials, and equipment to install seeding and sodding, with fertilizing and mulching for all disturbed areas that are not to be paved or otherwise treated in accordance with the Contract Documents. The Contractor shall re-establish vegetative cover in all areas where such cover existed prior to the beginning of the Work, and in areas so designated on the Drawings.
- B. The Work under this Section includes furnishing and placing topsoil, seed and sod, and mulching, fertilizing, watering, and maintenance until final acceptance by the Owner.

#### 1.02 QUALITY ASSURANCE

- A. The Contractor shall deliver a satisfactory stand of grass as specified. If necessary, the Contractor shall repeat any or all the work, including grading, seeding, or sodding, fertilizing, and watering until a satisfactory stand is obtained.
- B. A satisfactory stand of grass is herein defined as a full lawn cover of the predominant vegetative species existing prior to the beginning of the Work, or species as required herein, over areas to be seeded or sodded. Grass shall be alive and growing, free from weeds, and leaving no bare spots larger than one square foot in area, separated by at least 10 feet in distance.
- C. If a satisfactory stand of grass has not been obtained within a reasonable period of time, the Engineer will instruct the Contractor in writing that the vegetative cover is not adequate and additional measures as determined by the Engineer, including installation of sodding on areas previously treated with seed applications, shall be undertaken by the Contractor to establish the required satisfactory stand of grass, at no additional cost to the Owner.

### PART 2 - PRODUCTS

#### 2.01 MATERIALS

- A. Fertilizer: Fertilizer shall be a commercial, chemical type, uniform in composition, free flowing, conforming to state and federal laws and suitable for application with equipment designed for that purpose.

- B. Seed: Seed shall be delivered in original unopened packages bearing an analysis of the contents. Seed shall be guaranteed 95 percent pure with a minimum germination rate of 80 percent.
1. The following grass species may be established by seeding procedures.
    - a. Hulled Bermuda
    - b. Pensacola Bahia
    - c. Kentucky 31 Fescue
- C. Sod: The Contractor shall furnish sod equal to and similar in type as that disturbed by the Contractor's operations.
1. The following grass species shall be established by sodding procedures:
    - a. St. Augustine
    - b. Centipede
    - c. All other species not listed under Seeding.
  2. The following areas shall have vegetative cover restored by sodding procedures, regardless of the grass species.
    - a. Slopes steeper than four (4) horizontal to one (1) vertical.
    - b. Locations subject to concentrations of water flow or erosion including but not limited to roadway ditch bottoms and flume areas where storm water runoff is concentrated.
    - c. Repair of eroded areas within areas previously seeded.
- D. Mulch: Mulch shall be a fibrous, wood cellulose product produced for this purpose. It shall be dyed green and shall contain no growth or germination inhibiting substances and shall be manufactured so that when thoroughly mixed with seed, fertilizer, and water, in the proportions indicated it will form a homogenous slurry which is capable of being sprayed.
- E. Topsoil: Topsoil stockpiled during excavation may be used. If additional topsoil is required to replace topsoil removed during construction, it shall be obtained off site at no additional cost to the Owner. Topsoil shall be fertile, natural surface soil, capable of supporting the grassing specified.
- F. Water: Water shall be clean, fresh, and free of substances that would inhibit vigorous growth of turf. The Contractor shall make whatever arrangements necessary to ensure an adequate supply of water to meet the needs for the work. The Contractor shall furnish all necessary hose, equipment, attachments, and accessories for the adequate irrigation of lawns and planted areas as required.

## **PART 3 - EXECUTION**

### **3.01 GENERAL**

- A. Weather Conditions: Fertilizing, seeding, sodding, or mulching operations shall not be conducted when wind velocities exceed 15 miles per hour or when the ground is frozen, unduly wet, or otherwise not in a tillable condition.



- B. Soil Preparation: The ground to be seeded shall be graded in conformance with the Drawings and shall be loose and free of large rocks, roots, and other material which will interfere with the work. Areas to be sodded shall be pulverized or tilled to a depth of 3 inches.
- C. Soil Placement: Topsoil shall be spread evenly over all planting areas to a depth of 4 inches.
- D. Method of Seed Application: Fertilizer, seed, and mulch may be applied separately (Dry Method), or they may be mixed together with water and the homogeneous slurry applied by spraying (Hydraulic Method), except that all slopes 3 units horizontal to 1 unit vertical or steeper shall be stabilized by the Hydraulic Method.
- E. Sod placement shall begin upon arrival on site. Sod shall be placed with no space between edges and staggered so as to prevent a continuous seam. Sod shall be rolled, or hand tamped after placement.

### 3.02 DRY METHOD

- A. Fertilizing: The fertilizer shall be spread uniformly at the rate of approximately 1 pound per 55 square feet. The fertilizer shall be raked in and thoroughly mixed with the soil to a depth of approximately 2 inches prior to the application of seed or mulch.
- B. Seeding: The seed shall be broadcast uniformly at the rate of approximately 1 pound per 730 square feet. After the seed has been distributed it shall be incorporated into the soil by raking or by other approved methods.
- C. Mulch Application: Mulch shall be applied at the rate approximately 1 pound (air dried weight) per 30 square feet.

### 3.03 HYDRAULIC METHOD

The hydraulic method shall consist of the uniform application by spraying of a homogeneous mixture of water, seed, fertilizer, and mulch. The slurry shall be prepared by mixing the ingredients in the same proportions as indicated above. The slurry shall have the proper consistency to adhere to the earth slopes without lumping or running. Mixing time of materials shall not exceed 45 minutes from the time the seeds come into contact with the water in the mixer to the complete discharge of the slurry onto the slopes; otherwise, the batch shall be recharged with seed. The mixture shall be applied using equipment containing a tank having a built-in, continuous agitation and recirculation system, and a discharge system which will allow application of the slurry to the slopes at a continuous and uniform rate. The application rates of the ingredients shall be the same as those specified for the Dry Method. The nozzle shall produce a spray that does not concentrate the slurry nor erode the soil.

### 3.04 WATERING

Upon completion of the seeding and/or sodding, the entire area shall be soaked to saturation by a fine spray. The new planting shall be kept watered by a sprinkling system on the Site during dry weather or whenever necessary for proper establishment of the planting until final project acceptance. At no time shall the planting be allowed to dry out. Care shall be taken to avoid excessive washing or puddling on the surface and any such damage caused thereby shall be repaired by the Contractor, at no additional cost to the Owner.

### 3.05 MAINTENANCE PRIOR TO FINAL ACCEPTANCE

The Contractor shall maintain the planted areas in a satisfactory condition until final acceptance of the project. Such maintenance shall include the filling, leveling, and repairing of any washed or eroded areas, and sufficient watering to maintain the plant materials in a healthy condition. The Engineer may require replanting of any areas in which the establishment of the vegetative ground cover does not appear to be developing satisfactorily.

**END OF SECTION**

## SECTION 03300 - CAST-IN-PLACE CONCRETE

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. Scope: Contractor shall provide all labor, materials, equipment, and incidentals as shown, specified and required to furnish and install cast-in-place concrete, reinforcement and related materials.
- B. Coordination: Review installation procedures under other Sections and coordinate the installation of items that must be installed in the concrete.

#### 1.02 QUALITY ASSURANCE

- A. Source Quality Control:
  - 1. Concrete Testing Service:
    - a. Owner will employ a testing laboratory to perform materials evaluation, testing and design of concrete mixes.
    - b. Owner's laboratory will also evaluate concrete delivered to and placed at the site.
  - 2. Quality Control: Owner's laboratory will perform sampling and testing during concrete placement, as follows:
    - a. Sampling: ASTM C 172.
    - b. Slump: ASTM C 143, one test for each load at point of discharge.
    - c. Air Content: ASTM C 31, one for each set of compressive strength specimens.
    - d. Compressive Strength: ASTM C 39, one set for each 50 cubic yards or fraction thereof for each class of concrete; a minimum of one set for each pour of structural concrete; 1 specimen tested at 7 days, 2 specimens tested at 28 days.
- B. Reference Standards: Comply with the applicable provisions and recommendations of the following, except as otherwise shown or specified.
  - 1. ACI 301, Specifications for Structural Concrete for Building (includes ASTM Standards referred to herein except ASTM A 36).
  - 2. ACI 347, Recommended Practice for Concrete Formwork.
  - 3. ACI 304, Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete.
  - 4. ACI 315, Manual of Standard Practice for Detailing Reinforced Concrete Structures.
  - 5. ACI 305, Recommended Practice for Hot Weather Concreting.
  - 6. ACI 306, Recommended Practice for Cold Weather Concreting
  - 7. ASTM A36, Structural Steel.
  - 8. Concrete Reinforcing Steel Institute, Manual of Standard Practice, include ASTM Standards referred herein.

### 1.03 SUBMITTALS

- A. Mix Design: In advance of concrete operations, materials proposed for use in concrete will be sampled and tested to determine their compliance with these specifications. Mix proportions shall be reviewed by the laboratory for each strength and type of concrete required and reports submitted to the Engineer for approval, showing the mix designs. Include the following information in concrete mix design:
1. Proportions of cement, fine and coarse aggregate, and water
  2. Water-cement ratio, 28-day compressive and design strength, slump, and air content
  3. Type of cement and aggregate
  4. Aggregate gradation
  5. Type and dosage of admixtures
  6. Special requirements for pumping
  7. Range of ambient temperature and humidity for which design is valid
  8. Special characteristics of mix which require precautions in mixing, placing, or finishing techniques to achieve finished product specified
- B. Samples: Submit samples of materials as specified and may be requested by the Engineer including names, sources, and descriptions.
- C. Shop Drawings: Submit the following for approval in accordance with the General Requirements and with additional requirements as specified.
1. Copies of manufacturer's specifications with application and installation instructions for proprietary materials and items, including admixtures and bonding agents.
  2. Drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315, Chapters 1 thru 8. For walls, show elevations to a minimum scale of 3 inch to 1 foot. Show bar schedules, stirrup spacing, diagrams of bent bars, arrangements, and assemblies, as required for the fabrication and placement of concrete reinforcement.
  3. List of concrete materials and concrete mix designs proposed for use. Include the results of all tests performed to qualify the materials and to establish the mix designs in accordance with ACI 301, 3.9. Submit written report to Engineer for each proposed concrete mix at least 15 days prior to start of Work. Do not begin concrete production until mixes have been reviewed and are acceptable to Engineer. Mix designs may be adjusted when material characteristics, job conditions, weather, test results or other circumstances warrant. Do not use revised concrete mixes until submitted to and accepted by Engineer.
- D. Laboratory Test Reports: Submit copies of historical laboratory test reports for concrete cylinders, materials and mix design tests. Production of concrete to comply with specified requirements is the responsibility of the Contractor.

#### 1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver concrete reinforcement materials to the site bundled, tagged, and marked. Use tags indicating bar size, lengths, and other information corresponding to markings shown on placement diagrams.
- B. All materials used for concrete shall be kept clean and free from all foreign matter during transportation and handling and kept separate until measured and placed in the mixer. Bins or platforms having hard clean surfaces shall be provided for storage. Suitable means shall be taken during hauling, piling and handling to ensure that segregation of the coarse and fine aggregate particles does not occur and the grading is not affected.

### PART 2 - PRODUCTS

#### 2.01 CONCRETE MIX DESIGN

- A. Concrete Paving for Drives: Unless noted otherwise, mix design shall be Type B as defined in the LSSRB, 2016 Edition and latest revisions.
- B. Concrete for Incidentals: Unless noted otherwise, mix design shall be Type M as defined in the LSSRB, 2016 Edition and latest revisions.

#### 2.02 CONCRETE MATERIALS

- A. Portland Cement:
  - 1. Wet Well and Valve Box: ASTM C 150, Type II.
  - 2. All other Uses: ASTM C 150, Type I.
- B. Aggregates: ASTM C33.
  - 1. Fine Aggregate: Clean, sharp, natural sand free from loam, clay, lumps or other deleterious substances. Dune sand, bank run sand and manufactured sand are not acceptable.
  - 2. Coarse Aggregate: Clean, uncoated, processed aggregate containing no clay, mud, loam, or foreign matter, as follows:
    - a. Crushed stone, processed from natural rock or stone.
    - b. Washed gravel, either natural or crushed. Use of slag and pit or bank run gravel is not permitted.
- C. Coarse Aggregate Size: Size to be in accordance with ASTM C33, Nos. 57 or 67, unless permitted otherwise by Engineer.
- D. Water: Clean, potable.
- E. Air-Entraining Admixture: ASTM C 260.
- F. Water-Reducing Admixture: ASTM C 494. Only use admixtures which have been tested and accepted in mix designs.
- G. Slump Limits: Proportion and design mixes to result in concrete slump at the point of placement of not less than one inch and not more than four inches.
- H. Crystalline Waterproofing Admixture: Wet well and valve box shall have admixture included in concrete at time of batching. Admixture shall be at a rate of 15 lbs/cubic yard of concrete and in accordance with the manufacturer's instructions.

1. Manufacturer:
  - a. Xypex,
  - b. Or equal.

## 2.03 FORM MATERIALS

- A. Provide form materials with sufficient stability to withstand pressure of placed concrete without bow or deflection.
- B. Exposed Concrete Surfaces: Acceptable panel-type to provide continuous, straight, smooth, as-cast surfaces. Use largest practical sizes to minimize form joints.
- C. Unexposed Concrete Surfaces: Suitable material to suit project conditions.
- D. Provide  $\frac{3}{4}$  inch chamfer at all exposed corners.

## 2.04 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A615, Grade 60.
- B. Welded Wire Fabric: ASTM A185.
- C. Steel Wire: ASTM A82.
- D. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting and fastening reinforcement in place.
  1. Use wire bar type supports complying with CRSI recommendations, except as specified below. Wood, brick, or other unacceptable materials, shall not be used.
  2. For slabs on grade, supports shall have sand plates or horizontal runners where base materials will not support chair legs.
  3. For all concrete surfaces, where legs of supports are in contact with forms, provide supports complying with CRSI, Manual of Standard Practice as follows:  
Either hot-dip galvanized, plastic protected or stainless steel legs.

## 2.05 GROUT

- A. Non-metallic, 100 percent solids, high strength epoxy grout.
  1. Use clean well graded sand with epoxy resins suitable for use on dry or damp surfaces.
  2. Product and Manufacturer; Provide one of the following:
    - a. Euco High Strength Grout by the Euclid Chemical Company.
    - b. Sikadur 42 Grout by Sika Chemical Company.
    - c. Five Star Epoxy Grout by U.S. Grout Corporation.
    - d. Or equal.
- B. Nonshrink, Nonmetallic Grout:
  1. Premixed nonstaining cementitious grout requiring only the addition of water at the job site.
  2. Product and Manufacturer: Provide one of the following:
    - a. Euco N-S by the Euclid Chemical Company.

- b. Masterflow 713 by Master Builders Company.
  - c. Five Star by U.S. Grout Corporation.
  - d. Or equal.
- C. Ordinary Cement-Sand Grout:
- 1. Except where otherwise specified use 1 part cement to 3 parts sand complying with the following:
    - a. Cement: ASTM C 150, Type I.
    - b. Sand: ASTM C 33.

## 2.06 JOINTS

- A. Expansion joint filler shall be performed expansion joint filler complying with ASTM D1752, Type II cork.
- B. Joint sealer:
  - 1. Exterior and Interior Joints in Horizontal Planes: Two-Component Polyurethane Sealant:
    - a. Polyurethane-based, 2-part elastomeric sealant complying with the following:
      - (1) FS TT-S-00227, Type 1 (self-leveling) Class A.
      - (2) Water Immersion Bond, FS TT-S-00227; Elongation of 25 percent with no adhesive failure.
      - (3) Hardness (Standard Conditions), ASTM C 661: 30-40.
      - (4) Stain and Color Change, FS TT-S-00227 and ASTM C 510: No discoloration or stain.
      - (5) Accelerated Aging, ASTM C 793: No change in sealant characteristics after 250 hours in weatherometer.
    - b. Product and Manufacturer: Provide one of the following:
      - (1) Sonolastic Paving Joint Sealant by Sonneborn Division of Contech Incorporated.
      - (2) Vulkem 255 by Mameco International.
      - (3) Or equal.

## PART 3 - EXECUTION

### 3.01 INSPECTION

The Contractor shall examine the substrate and the conditions under which Work is to be performed and notify the Engineer of unsatisfactory conditions. The Contractor shall not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to Engineer.

### 3.02 FORMWORK

- A. Formwork: Construct formwork so that concrete members and structures are correct size, shape, alignment, elevation, and position, complying with ACI 347.

- B. Provide openings in formwork to accommodate Work of other trades. Accurately place and securely support items built into forms.
- C. Clean and adjust forms prior to concrete placement. Apply form release agents or wet forms, as required. Retighten forms during and after concrete placement if required to eliminate mortar leaks.

### 3.03 REINFORCEMENT, JOINTS, AND EMBEDDED ITEMS

- A. Comply with the applicable recommendations of specified codes and standards, and ACI Manual No. SP-66, latest edition, for details and methods of reinforcement placement and supports.
- B. Clean reinforcement to remove loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.
- C. Position, support, and secure reinforcement against displacement during formwork construction or concrete placement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required.
  - 1. Place reinforcement to obtain the minimum concrete converges as shown and as specified in ACI 318. Arrange, space, and securely tie bars and bar supports together with 16 gauge wire to hold reinforcement accurately in position during concrete placement operations. Set with ties so that twisted ends are directed away from exposed concrete surfaces.
  - 2. Reinforcing steel shall not be secured to forms with wire, nails or other ferrous metal. Metal supports subject to corrosion shall not touch formed or exposed concrete surfaces.
- D. Provide sufficient numbers of supports of strength required to carry reinforcement. Reinforcing bars shall not be placed more than 2 inches beyond the last leg of any continuous bar support. Supports shall not be used as bases for runways for concrete conveying equipment and similar construction loads.
- E. Splices: Provide standard reinforcement splices by lapping ends, placing bars in contact, and tying tightly with wire. Comply with requirements for minimum lap of spliced bars.
- F. Install welded wire fabric in as long lengths as practical, lapping at least one mesh.
- G. Concrete shall not be placed until the reinforcing steel is inspected and approved by the Engineer for placing concrete. All concrete placed in violation of this provision will be rejected.
- H. Joints: Provide construction, isolation, and control joints as indicated or required. Locate construction joints so as to not impair the strength and appearance of the structure. Place isolation and control joints in slabs on ground to stabilize differential settlement and random cracking.
- I. Installation of Embedded Items: Set and build into the Work anchorage devices and embedded items required for other Work that is attached to or supported by cast-in-place concrete. Use setting diagrams, templates and instructions provided under other Sections and other contracts for locating and setting. Refer also to Paragraph 1.01.B., Coordination, above.

### 3.04 CONCRETE AND PLACEMENT



- A. Only ready-mixed concrete shall be used. It shall be in accordance with ASTM C 94.
- B. Concrete Placement: Comply with ACI 304, placing concrete in a continuous operation within planned joints or sections. Placement shall not begin until work of other trades affecting concrete is completed.
- C. Consolidate placed concrete using mechanical vibrating equipment with hand rodding and tamping, so that concrete is worked around reinforcement and other embedded items and into all parts of forms.
- D. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placement, and curing.
  - 1. In cold weather comply with ACI 306.
  - 2. In hot weather comply with ACI 305.

### 3.05 QUALITY OF CONCRETE WORK

- A. Make all concrete solid, compact and smooth, and free of laitance, cracks, and cold joints.
- B. Cut out and properly replace to the extent ordered by the Engineer, or repair to the satisfaction of the Engineer, surfaces which contain cracks or voids, are unduly rough, or are in any way defective. Patches or plastering shall not be used.
- C. Repair, removal, and replacement of defective concrete as ordered by the Engineer shall be at no additional cost to the Owner.

### 3.06 CURING

- A. Begin initial curing after placing and finishing concrete as soon as free water has disappeared from exposed surfaces. Where possible, keep continuously moist for not less than 72 hours. Continue curing with the use of moisture-retaining cover or membrane-forming curing compound. Cure formed surfaces by moist curing until forms are removed. Provide protection as required to prevent damage to exposed concrete surfaces.
- B. Forms on structural walls shall be left in place for a minimum of 72 hours unless a cylinder break indicates the strength of the concrete has reached 75 percent of design strength.
- C. Forms on structural floors and ceiling shall be left in place until a cylinder break indicates the strength of the concrete has reached 85 percent of design strength.

### 3.07 FINISHES

- A. After placing concrete slabs, do not work the surface further until ready for floating. Begin floating when the surface water has disappeared or when the concrete has stiffened sufficiently. Check and level the surface plane to a tolerance not exceeding 3 inch in 10 feet when tested with a 10-foot straightedge placed on the surface at not less than 2 different angles. Cut down high spots and fill all low

spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat the surface to a uniform, smooth, granular texture.

- B. After floating, begin the first trowel finish operation using a trowel. Begin final troweling when the surface produces a ringing sound as the trowel is moved over the surface.
- i. Consolidate the concrete surface with the final hand troweling operation. Finish shall be free of trowel marks, uniform in texture and appearance, and with a surface plane tolerance not exceeding 1/8 inch in 10 feet when tested with a 10-foot straight edge. Grind smooth surface defects.
  - ii. Use trowel finish for the following: Interior exposed slabs unless otherwise shown or specified.
  - iii. Apply non-slip broom finish to exterior concrete slab and elsewhere as shown on the Drawings.

### 3.08 GROUT PLACEMENT

General:

1. Place grout as shown and in accordance with manufacturer's instructing. If manufacturer's instructions conflict with the Specifications do not proceed until the Engineer provides clarification.
2. Drypacking shall not be used.
3. Manufacturers of proprietary products shall make available upon 72 hours notification the services of a qualified, full-time employee to aid in assuring proper use of the product under job conditions.
4. Placing grout shall conform to the temperature and weather limitations described in Paragraph 3.04 above.

**END OF SECTION**

## SECTION 05500 - MISCELLANEOUS METALS

### PART 1 - GENERAL

#### 1.01 REQUIREMENT

The CONTRACTOR shall provide miscellaneous metalwork and appurtenances, complete and in place, in accordance with the Contract Documents. This Section includes the requirements for handrailing and grating.

#### 1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

##### A. Federal Specifications

MIL-G-18015 A(3) (Ships) Aluminum Planks. (6063-T6)

MIL-A-907E Antiseize Thread Compound, High Temperature

##### B. Commercial Standards

AA-M32C22A41 Aluminum Association

AASHTO HS-20 Truck Loading

AISC Manual of Steel Construction

ASTM A 48 Gray Iron Castings

ASTM A 193 Alloy Steel and Stainless Steel Bolting Materials for High Temperature Service

ASTM A 194 Carbon and Alloy Steel Nuts for Bolts for High Pressure and High Temperature Service

#### 1.03 CONTRACTOR SUBMITTALS

A. The CONTRACTOR shall furnish submittals in accordance with Section 01300 - Shop Drawings, Product Data, and Samples.

B. Shop Drawings: Shop Drawings shall conform to AISC recommendations and specifications and shall show holes, etc. required for other parts of the WORK. Drawings shall include complete details of members and connections, anchor bolt layouts, schedules for fabrication procedures, and diagrams for the sequence of erection.

1. Layout drawings for ladders, railings, grating, showing the direction of

span, type and depth of grating, size and shape of grating panels, seat angle details, and details of grating hold down fasteners. Load and deflection tables shall be submitted for each style and depth of grating used.

## **PART 2 - PRODUCTS**

### **2.01 GENERAL REQUIREMENTS**

- A. **Stainless Steel:** Unless otherwise indicated, stainless steel metalwork and bolts shall be of Type 316 stainless steel.
- B. **Aluminum:** Unless otherwise indicated, aluminum metalwork shall be of Alloy 6061-T6. Aluminum in contact with concrete, masonry, wood, porous materials, or dissimilar metals shall have contact surfaces coated in accordance with manufacturer's recommendations.

### **2.02 ALUMINUM RAILINGS**

- A. **General:** Aluminum handrails and railings shall be component systems complete with anchors, attachments, balusters, brackets, caps, fasteners, gates (swing with self-latching hardware or be removable), posts, sleeves, trim, and any other related items required or necessary for a complete installation. Gates and removable rail sections shall be complete with hardware such as self-closing hinges, self-latching latches, hasps, etc. Railings shall conform to the Building Code and OSHA General Industry Occupational Safety and Health Standards (29CFR1910).
- B. **Materials:** Materials shall conform to the following:
  - 1. **Aluminum:** Aluminum shall be U.S. Alloy 6063 T-5 or T-6. Aluminum pipe rail shall not be less than 1-1/2 inch diameter Schedule 40 pipe.
  - 2. **Electrolysis Protection:** Electrolysis protective material shall be used for surfaces in contact with dissimilar metals and concrete.
  - 3. **Sleeves:** Sleeves shall be of galvanized steel or PVC.
  - 4. **Grout:** Grout for handrail posts shall consist of an inorganic, non-shrink, non-metallic premixed grout in accordance with Section 03300 - Cast in Place Concrete with a minimum 28 Day compressive strength of 4,000 psi.
  - 5. **Fasteners:** Fasteners, screws, and bolts shall be concealed and shall be of stainless steel or aluminum.
  - 6. **Welding Rods:** Aluminum welding rods shall be of a type recommended by the aluminum manufacturer for anodized finished products.
  - 7. **Kickplates:** Kickplates shall be provided on railings, not set in curbs.
- C. **Finishes:** Pipe railing system including handrails, railings, tube caps, and other miscellaneous parts of rails shall be provided with a clear anodized finish, AA-

M32C22A41.

- D. Manufacturers or Equal,
  - 1. C-V Pipe Rail by Crane Veyor Corp.
  - 2. Connectorail by Julius Blum and Co.

## 2.3 METAL GRATING

- A. General: Metal grating shall be of the design, sizes, and types indicated. Grating shall be completely banded at edges and cutouts using material and cross section equivalent to the bearing bars. Such banding shall be welded to each cut bearing bar. Grating shall be supported around an opening by support members. Where grating is supported on concrete, embedded support angles matching grating material shall be used, unless indicated otherwise. Such angles shall be mitered and welded at corners.
  - 1. Pieces of grating shall be fastened in 2 locations to each support.
  - 2. Where grating forms the landing at the top of a stairway, the edge of the grating that forms the top riser shall have an integral non-slip nosing, width equal to that of the stairway.
  - 3. Where grating depth is not given, grating shall be provided that will be within allowable stress levels and which shall not exceed a deflection of 1/4-inch or the span divided by 180, whichever is less. For standard duty plank and safety grating, the loading to be used for determining stresses and deflections shall be the uniform live load of the adjacent floor or 100 psf, whichever is greater or a concentrated load of 1000 pounds. For heavy duty grating, the loading used for determining stresses and deflections shall be AASHTO HS-20. The minimum depth shall be one inch.
- B. Material
  - 1. Except where indicated otherwise, bar grating shall be fabricated entirely of aluminum as follows: Bearing and banding bars, alloy 6061-T6; cross bars, alloy 6063-T5.
  - 2. Safety grating shall be fabricated of aluminum alloy 5052-H32.
  - 3. Plank grating shall be fabricated of aluminum alloy 6063-T6.
  - 4. Grating that may be partially or wholly submerged shall be fabricated entirely of stainless steel, Type 316.
- C. Standard-Duty Grating
  - 1. No single piece of grating shall weigh more than 80 pounds, unless indicated otherwise. Standard duty grating shall be serrated bar grating.
  - 2. Cross bars shall be welded or mechanically locked tightly into position so that there is no movement allowed between bearing and cross bars.
- D. Safety Grating: Safety grating shall be made of sheet metal punched into an open serrated diamond pattern and be formed into plank sections. The open diamond

shapes shall be approximately 1-7/8 inch by 11/16-inch in size. Safety grating shall be Grip Strut by Metal Products Division, United States Gypsum Company; Deck Span by IKG Industries, or equal.

- E. Plank Grating: Plank grating shall be extruded in 6-inch widths with a minimum of 6 integral 1-bar type bearing bars per plank. The top surface shall be solid with raised ribs, unless indicated otherwise. Where punched grating is required, the top surface shall be provided with a pattern of 3-inch by 19/32-inch rectangular openings spaced at 4-inches on center. The planks shall have continuous tongue and groove type interlock at each side, except that interlocking planks shall be arranged so that any 4-foot wide section may be removed independently from the other grating sections. Plank grating shall be provided with a clear anodized finish, except that punched grating may have standard mill finish.

## 2.3 BOLTS AND ANCHORS

- A. Standard Service (Non-Corrosive Application): Unless otherwise indicated, bolts, anchor bolts, washers, and nuts shall be steel as indicated. Threads on galvanized bolts and nuts shall be formed with suitable taps and dies such that they retain their normal clearance after hot-dip galvanizing. Except as otherwise indicated, steel for bolt material, anchor bolts, and cap screws shall be in accordance with the following:
  - 1. Structural connections: ASTM A 307, Grade A or B, hot-dip galvanized.
  - 2. Anchor Bolts: ASTM A 307, Grade A or B, or ASTM A 36, hot-dip galvanized.
  - 3. High strength bolts where indicated: ASTM A 325.
  - 4. Pipe and equipment flange bolts: ASTM A 193, Grade B-7.
- C. Corrosive Service: Bolts, nuts, and washers in the locations listed below shall be stainless steel as indicated.
  - 1. Buried locations.
  - 2. Submerged locations.
  - 3. Locations subject to seasonal or occasional flooding.
  - 4. Inside hydraulic structures below the top of the structure.
  - 5. Inside buried vaults, manholes, and structures that do not drain through a gravity sewer or to a sump with a pump.
  - 6. Chemical handling areas.
  - 7. Inside trenches, containment walls, and curbed areas.
  - 8. Locations indicated by the Contract Documents or designated by the ENGINEER to be provided with stainless steel bolts.

Unless otherwise indicated, stainless steel bolts, anchor bolts, nuts, and washers shall be Type 316 stainless steel, Class 2, conforming to ASTM A 193 for bolts and to ASTM A 194 for nuts. Threads on stainless steel bolts shall be protected with an antiseize lubricant suitable for submerged stainless steel bolts, to meet government specification MIL-A-907E. Buried bolts in poorly drained soil shall

be coated the same as the buried pipe.

1. Antiseize lubricant shall be classified as acceptable for potable water use by the NSF.
2. Antiseize lubricant shall be "PURE WHITE" by Anti-Seize Technology, Franklin Park, IL, 60131, AS-470 by Dixon Ticonderoga Company, Lakehurst, NJ, 08733, or equal.

D. Bolt Requirements

1. The bolt and nut material shall be free-cutting steel.
2. The nuts shall be capable of developing the full strength of the bolts. Threads shall be Coarse Thread Series conforming to the requirements of the American Standard for Screw Threads. Bolts and cap screws shall have hexagon heads and nuts shall be Heavy Hexagon Series.
3. Bolts and nuts shall be installed with washers fabricated of material matching the base material of bolts, except that hardened washers for high strength bolts shall conform to the requirements of the AISC Specification. Lock washers fabricated of material matching the bolts shall be installed where indicated.
4. The length of each bolt shall be such that the bolt extends at least 1/8-inch beyond the outside face of the nut before tightening, except for anchor bolts, which shall be flush with the face of the nut before tightening.
5. Dielectric material or insulating washers shall be used between dissimilar metals.

## **PART 3 - EXECUTION**

### **3.01 FABRICATION AND INSTALLATION REQUIREMENTS**

- A. Aluminum Ladders and Railings: Aluminum railing fabrication and installation shall be performed by craftsmen experienced in the fabrication of architectural metalwork. Exposed surfaces shall be free from defects or other surface blemishes. Dimensions and conditions shall be verified in the field. Joints, junctions, miters, and butting sections shall be precision fitted with no gaps occurring between sections, and with surfaces flush and aligned. Electrolysis protection of materials shall be provided.

**END OF SECTION**

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## SECTION 09800 - PROTECTIVE COATINGS

### PART 1 - GENERAL

#### 1.01 SCOPE OF WORK

This specification covers preparation of surfaces, performance and completion of painting and coating of all surfaces unless specified otherwise elsewhere in the specifications and the drawings.

#### 1.02 DELIVERY AND STORAGE

All materials delivered to job site shall be in original sealed and labeled containers of the paint manufactured.

#### 1.03 SUBMITTALS

A. The Contractor shall submit manufacturer's literature for each product to be used giving the name, generic type, descriptive information and evidence of satisfactory past performance. Submittals shall include the following performance data as certified by a qualified testing laboratory:

1. Abrasion - Fed. Test Method Std. No. 141, Method 6192, CS-17 Wheel, 1,000 grams load.
2. Adhesion - Elcometer Adhesion Tester.
3. Exterior Exposure - Exposed at 45 degrees facing ocean (South Florida Marine Exposure).
4. Hardness - ASTM D3363-74
5. Humidity - ASTM D2247-68
6. Salt Spray (Fog) - ASTM B117-73

B. Upon completion of installation, the Contractor shall submit written certification from the manufacturer that all work has been performed within the limits prescribed by the manufacturer.

### PART 2 - PRODUCTS

#### 2.01 COLORS

A. Colors, where not specified, shall be as selected by the Engineer. The Contractor shall furnish color chips for each protective coating system for review and selection.

B. Safety Color Code for Marking Physical Hazards. The safety color selected for the marking of physical hazards and safety, fire fighting and protection equipment shall be in accordance with OSHA 1910.144.

1. Safety Color Selection

Colors shall meet the tests specified in ANSI Z53.1. The colors used shall conform to the color chips identified by numbers specified in Federal Standard 595.

<u>Color</u>	<u>Standard</u>	<u>Color</u>	<u>Standard</u>
Red	11105	Blue	15120
Yellow	13655	Purple	17142
Orange	12246	White	17875
Green	14260	Black	17038

- C. Color selection for the items not covered by OSHA Color Standards shall either be in accordance with the Painting Schedule, or to be determined after submittal of color chips by Contractor.
- D. Piping Color Code. In order to facilitate identification of piping, the different above ground pipelines and equipment shall be color-coded. The following color scheme shall be used for the purposes of standardization. The use of paints containing lead or mercury is strictly prohibited. The contents and direction of flow shall be stenciled on the piping in a contrasting color. All piping shall be identified with labels and flow direction every 10 feet and with at least two labels in each room, closet, or pipe chase. The paint system shall be TNEMEC (specified in parenthesis below), or engineer approved equal.
- a. Water Lines
    - i. Raw or Recycle: Olive Green (110GN Clover)
    - ii. Settled or Clarified: Aqua (10GN Aqua Sky)
    - iii. Finished or Potable: Dark Blue (11sf Safety Blue)
    - iv. Pumping Unit: Dark Blue (11sf Safety Blue)
  - b. Chemical Lines
    - i. Alum or Primary Coagulant: Orange (04SF – Safety Orange)
    - ii. Ammonia: White (00WH White)
    - iii. Carbon Slurry: Black (35GR Black)
    - iv. Caustic: Yellow with Green Band (02SF Safety Yellow, 09SF Safety Green)
    - v. Chlorine (Gas and Solution): Yellow (02SF Safety Yellow)
    - vi. Chlorine Dioxide: Yellow with Violet Band
    - vii. Fluoride: Light Blue with Red Band (25BL Fountain, 06SF Safety Red)
    - viii. Lime Slurry: Light Green (37GN Irish Spring)
    - ix. Polymers or Coagulant Aids: Orange with Green Band (04SF – Safety Orange, 09SF Safety Green)
  - c. Others
    - i. Compressed Air: Dark Green (91GN Balsam)

- ii. Gas: Red (28Rd Monterrey Tile)
- iii. Other Lines: Light Gray (32GR Light Gray)

2.02 COATING SCHEDULE

A. Ferrous Metal Surfaces - Exterior Environment (UV exposure)

1. Surface Preparation for Carbon Steel: SSPC-SP6/NACE 3 Commercial Blast Cleaning.
2. Surface Preparation for Cast Iron & Ductile Iron: Clean as required to remove all soluble surface contaminants. Abrasive blast all surfaces to be coated in accordance with NAPF 500-03-04 to remove all insoluble surface contaminants and to achieve a minimum surface profile of 1.5 mils.
3. Coating System

		<u>Dry Film Thickness (mils)</u>
1 <sup>st</sup> Coat	Polyamidoamine Epoxy Tnemec Series N69	4.0-6.0
2 <sup>nd</sup> Coat	Polyamidoamine Epoxy Tnemec Series N69	4.0-6.0
3 <sup>rd</sup> Coat	Aliphatic Acrylic Polyurethane Tnemec Series 1074U	2.5-3.0
		Total System 10.5-15

4. Description: Ferrous metal surfaces not installed within an enclosed structure including piping, fittings, couplings, adaptors, valves, etc.

B. Ferrous Metal Surfaces - Corrosive Gas or Immersion Environment

1. Surface Preparation for Carbon Steel SSPC-SP10/NACE 2 Near-White Blast Cleaning
2. Surface Preparation for Cast Iron & Ductile Iron: Clean as required to remove all soluble surface contaminants. Abrasive blast all surfaces to be coated in accordance with NAPF 500-03-04 to remove all insoluble surface contaminants and to achieve a minimum surface profile of 1.5 mils
3. Coating System

		<u>Dry Film Thickness (mils)</u>
1 <sup>st</sup> Coat	Polyamidoamine Epoxy Tnemec Series N69	4.0-6.0
2 <sup>nd</sup> Coat	Cycloaliphatic Amine Epoxy	5.0-6.0

3 <sup>rd</sup> Coat	Tnemec Series 104 Cycloaliphatic Amine Epoxy Tnemec Series 104	5.0-6.0
		Total System 14-18

4. Description: Ferrous metal surfaces exposed or immersed in pump station wet wells, manholes immediately upstream of wet wells, drop manholes, discharge manholes, or similar locations, including piping, fittings, valves, pumps, etc.

C. Interior of Existing Concrete Structures - Corrosive Gas or Immersion Environment

1. System A - 100% Solids Epoxy.

- a. Surface Preparation: Abrasive blast to remove laitance, form release agents, curing compounds, sealers, or other contaminants and to achieve a surface profile equivalent to ICRI CSP 5.

b. Materials:

		<u>Dry Film Thickness (mils)</u>
1 <sup>st</sup> Coat	Cementitious Epoxy Resurfacer Tnemec Series 218 Motarclad	1/16 <sup>th</sup> Inch
2 <sup>nd</sup> Coat	100% Solids Polyamine Epoxy Mortar Tnemec Series 434 H2S Permashield	125
3 <sup>rd</sup> Coat	100% Solids Polyamine Epoxy Tnemec Series 435 H2S	12.0 - 15.0

2. System B - Cementitious Coating.

- a. Surface Preparation: The use of high pressure water cleaning, hydro blasting, abrasive blasting, grinding and detergent water cleaning shall conform to manufacturer's recommendations. All surface defects repair materials and procedures shall conform to manufacturer's recommendations.

b. Materials:

		<u>Dry Film Thickness (mils)</u>
1 <sup>st</sup> Coat	Cementitious Coating Dinjer CMS-10K	1/16 <sup>th</sup> Inch
2 <sup>nd</sup> Coat	Amine Epoxy Mortar Dinjer SG Mastic	100

- c. Cementitious Coating: Shall be quick setting, high strength, sulfide

resistant, calcium aluminate-based or portland cement material; suitable for troweling or rotary spray application to inside of structure. Additives shall be used to increase corrosion resistance or bond strength at manufacturer's direction and with Engineer's approval.

## 2.03 PERFORMANCE REQUIREMENTS

A. Polyamidoamine Epoxy: Polyamidoamine epoxy shall contain no lead or soluble chromates. Polyamidoamine epoxy shall be able to weather sixty (60) days prior to top coating with itself or aliphatic urethanes. Scarify surface before top coating if exposed to sunlight for 60 days or longer.

- 1) Minimum Solids per Gallon: 67.0 +/- 2.0%
- 2) Abrasion: No more than 115 mg loss after 1000 cycles (ASTM D 4060, CS-17 Wheel, 1,000 grams load)
- 3) Adhesion: Not less than 1600 psi pull average of three trials (ASTM D 4541 Elcometer Adhesion Tester)
- 4) Exterior Exposure: No blistering, cracking or delamination of the film. No more rust creepage at scribe or after seventy-two months exposure.
- 5) Fresh Water Immersion: No blistering, cracking, softening or delamination of the film after 4 years immersion in 77 F. tap water (ASTM D 870).
- 6) Hardness: Must pass 3H (ASTM D 3363)
- 7) Salt Fog: No blistering, rusting, cracking, softening or delamination of the film. No more than 1/8 inch rust creepage at scribe after 8,000 hours exposure (ASTM B117).
- 8) Manufacturer: Tnemec N69 Hi-Build Epoxoline II, or equal.

B. Cycloaliphatic Amine Epoxy:

- 1) Minimum Solids per Gallon: 82.0 +/- 2.0%
- 2) Abrasion: No more than 120 mg loss after 1000 cycles (ASTM D 4060, CS-17 Wheel, 1,000 grams load)
- 3) Chemical Resistance: No blistering, cracking, softening or delamination of the film after seven days exposure at 75°F to 10% sulfuric acid, 50% sodium hydroxide, 10% hydrochloric acid, 10% phosphoric acid and 5% sodium chloride.
- 4) Salt Spray Resistance: No blistering, rusting, cracking, softening or delamination of the film. No more than 1/32 inch rust creepage at scribe after 1,500 hours exposure (ASTM B 117-73).
- 5) Manufacturer: Tnemec 104 H.S. Epoxy, or equal.

C. Aliphatic Acrylic Polyurethane:

- 1) Minimum Solids per Gallon: 100.0 +/- 2.0%
- 2) Abrasion: No more than 116 mg loss after 1000 cycles (ASTM D 4060, CS-

- 17 Wheel, 1,000 grams load)
- 3) UV Resistance: No blistering, cracking, or chalking of the film, and no less than 64% gloss retention (33 units gloss change), after 7000 hours exposure (ASTM D 4587, UVA-340 bulbs, Cycle 4: 8 hours UV/4 hours condensation).
  - 4) Humidity Resistance: No blistering, rusting, cracking, or delamination of the film after 2,500 hours exposure (ASTM D 4585).
  - 5) Manufacturer: Tnemec 1074U Endurashield II, or equal.

D. Cementitious Coating:

- 1) Density when applied: 135 lb./cf. +/- 5 lb./cf.
- 2) Compressive strength (ASTM C109) at 1 day Minimum acceptable: 2,000 psi.
- 3) Compressive strength (ASTM C109) at 28 days Minimum acceptable: 5,500 psi.
- 4) Bond Strength (ASTM C882) at 28 days minimum acceptable: 1,640 psi.
- 5) Flexural Strength (ASTM C78) at 28 days minimum acceptable: 1,500 psi.
- 6) Manufacturer: Dinjer CMS-10K, or equal.

E. Amine Epoxy:

- 1) Compressive strength (ASTM D-695) at 1 day Minimum acceptable: 12,000 psi.
- 2) Compressive strength (ASTM D-695) at 7 days Minimum acceptable: 13,000 psi.
- 3) Bond Strength (ASTM C882) at 14 days minimum acceptable: 3,000 psi.

## **PART 3 - EXECUTION**

### **3.01 GENERAL**

- A. All surface preparation, coating and painting shall conform to applicable standards of the Steel Structures Painting Council (SSPC), and the manufacturer's printed instructions. Material applied prior to approval of the surface by the Engineer shall be removed and reapplied to the satisfaction of the Engineer at the expense of the Contractor.
- B. All work shall be performed by skilled craftsmen qualified to perform the required work in a manner comparable with the best standards of practice. Continuity of personnel shall be maintained and transfers of key personnel shall be coordinated with the Engineer.
- C. The Contractor shall provide a supervisor at the work site during cleaning and application operation. The supervisor shall have the authority to sign change

orders, coordinate work and make decisions pertaining to the fulfillment of the contract.

- D. Dust, dirt, oil, grease or any foreign matter that will affect the adhesion or durability of the finish must be removed by washing with clean rags dipped in an approved cleaning solvent and wiped dry with clean rags as per SSPC SP1.
- E. Coating and painting systems include surface preparations, prime coating and finish coatings. Any off-site work that does not conform to this specification is subject to rejection by the Engineer.
- F. Shop applied prime coatings, which are damaged during transportation, construction or installation shall be thoroughly cleaned and touched up in the field as directed by the Engineer. The Contractor shall use repair procedures that insure the complete protection of all adjacent primer. The specified repair method and equipment may include wire brushing, hand, or power tool cleaning or dry air blast cleaning. In order to prevent injury to surrounding painted areas, blast cleaning may require use of lower air pressure, small nozzle and abrasive particle sizes, short blast nozzle, distance from surface, shielding and masking. If damage is too extensive or uneconomical to touch-up, then the item shall be re-cleaned and coated or painted as directed by the Engineer.
- G. The Contractor's coating and painting equipment shall be designed for application of materials specified and shall be maintained in first class working condition. Compressors shall have suitable traps and filters to remove water and oils from the air. Contractor's equipment shall be subject to approval of the Engineer.
- H. Application of the first coat shall follow immediately after surface preparation and cleaning and within an eight-hour working day. Any cleaned areas not receiving first coat within eight-hour period shall be re-cleaned prior to application of first coat.
- I. Prior to assembly, all surfaces made inaccessible after assembly shall be prepared as specified herein and shall receive the coating or paint system specified.
- J. Coatings shall be applied during good painting and coating weather. Air and surface temperatures as well as dew point shall be within limits prescribed by the manufacturer for the coating being applied and work areas shall be reasonably free of airborne dust at the time of application and while coating is drying.
- K. Field touch up painting shall be required on scratched or damaged surfaces.

### 3.02 SURFACE PREPARATION

- A. The latest revision of the following surface preparation specifications of the Steel Structures Painting Council (SSPC) shall form a part of this specification.

1. Solvent Cleaning (SSPC SP): Removal of oil, grease soil and other contaminants by use of solvents, emulsions, cleaning compounds, steam cleaning or similar materials and methods which involve a solvent or cleaning action.
  2. Hand Tool Cleaning (SSPC SP2): Removal of loose rust, loose mill scale and other detrimental foreign matter to degree specified by hand chipping, scraping, sanding and wire brushing.
  3. Power Tool Cleaning (SSPC-SP3): Removal of loose rust, loose mill scale and other detrimental foreign matter to degree specified by power wire brushing, power impact tools or power sanders.
  4. White Metal Blast Cleaning (SSPC-SP5): Blast cleaning to a gray-white uniform metallic color until each element of surface area is free of all visible residues.
  5. Commercial Blast Cleaning (SSPC-SP6): Blast cleaning until at least two thirds of each element of surface area is free of all visible residues.
  6. Brush-Off Blast Cleaning (SSPC-SP7): Blast cleaning to remove loose rust, loose mill scale and other detrimental foreign matter to degree specified.
  7. Near White Blast Cleaning (SSPC-SP10): Blast cleaning to nearly white metal cleanliness, until at least 95 percent of each element of surface area is free of all visible residues.
- B. Slag and weld metal accumulation and spatters not removed by the fabricator, erector or installer shall be removed by chipping and grinding. All sharp edges shall be peened, ground or otherwise blunted as required by the Engineer.
- C. Field blast cleaning for all surfaces shall be by dry method unless otherwise directed.
- D. Particle size of abrasives used in blast cleaning shall be that which will produce a 1 1/2 - 2 mil (37.5 microns - 50.0 microns) surface profile or in accordance with recommendations of the manufacturer of the specified coating or paint system to be applied.
- E. Abrasive used in blast cleaning operations shall be new, washed, graded, and free of contaminants that would interfere with adhesion of coating or paint and shall not be reused unless specifically approved by the Engineer.
- F. Surface preparation will be based upon comparison with: "Pictorial Surface preparation Standards for Painting Steel Surfaces", SSPC-Vis 1 ASTM Designation



D220; "Standards Methods of Evaluation Degree of Rusting on Painted Steel Surfaces", SSPC-Vis-2 ASTM Designation D610; "Visual Standard for Surfaces of New Steel Air blast Cleaned with Sand Abrasive".

- G. During blast cleaning operations, caution shall be exercised to insure that existing coatings or paint are not exposed to abrasion from blast cleaning.
- H. The Contractor shall keep the area of his work in a clean condition and shall not permit blasting materials to accumulate as to constitute a nuisance or hazard to the prosecution of the work or the operation of the existing facilities.
- I. Blast cleaned surfaces shall be cleaned prior to application of specified coatings or paint. No coatings or paint shall be applied over damp or moist surfaces.

### 3.03 APPLICATION

- A. Coating and paint application shall conform to the requirements of the Steel Structures Painting Council Paint Application Specification SSPC-PA latest revision for "Shop Field and Maintenance Painting", and the manufacturer of the coating and paint materials.
- B. Thinning shall be permitted only as recommended by the manufacturer and approved by the Engineer.
- C. Each application of coating or paint shall be applied evenly, free of brush marks, sags, runs, with no evidence of poor workmanship. Care shall be exercised to avoid lapping on glass or hardware. Coatings and paints shall be sharply cut to lines. Finished surfaces shall be free from defects or blemishes.
- D. Protective coverings or drop cloths shall be used to protect floors, fixtures, and equipment. Care shall be exercised to prevent coatings or paints from being splattered onto surfaces that are not to be coated or painted. Surfaces from which materials cannot be removed satisfactorily shall be recoated or repainted as required to produce a finish satisfactory to the Engineer.
- E. When two coats of paint are specified, where possible, the first coat shall contain sufficient approved color additive to act as an indicator of coverage or the two coats must be of contrasting color.
- F. Film thicknesses per coat specified are the minimum required. Contractor shall apply additional coats as necessary to achieve the specified thickness.
- G. No coating or paint shall be applied: When the surrounding air temperature or the temperature of the surface to be coated or painted is below 40 degrees F., too wet or damp surfaces or in rain, snow, fog or mist; when the temperature is less than 5 degrees F. above the dew point; when it is expected the air temperature will drop

below 40 degrees F. six hours after application of coating and paint. Dew point shall be measured by use of an instrument such as a Sling Psychrometer in conjunction with U.S. Department of Commerce Weather Bureau Psychrometric Tables.

- H. If above conditions are prevalent, coating or painting shall be delayed or postponed until conditions are favorable. The day's coating or painting shall be completed in time to permit the film sufficient drying time prior to damage by atmospheric conditions.
- I. All material shall be applied as per manufacturer's recommendations.
- J. All welds and irregular surfaces shall receive a brush coat of the specified product prior to application of the first complete coat.
- K. All parts that can be disassembled such as vents and manhole covers shall be removed and coated inside and out as per applicable coating systems. Upon completion of coating, those parts disassembled shall be reassembled prior to placing in service.

#### 3.04 ACCEPTANCE OF WORK

- A. All surface preparation and repairs shall be approved by the Engineer/Owner before primer is applied.
- B. The Contractor shall request and receive acceptance of each coat before applying next coat.
- C. The Contractor shall correct work that is not acceptable and request reinspection.
- D. Thickness of coatings and or the paint shall be checked with a non-destructive, magnetic type thickness gauge. (Use an instrument such as a Tooke Gauge if a destructive tester is deemed necessary.) Coating integrity of interior coated surfaces shall be tested with approved inspection devices. Holiday detection shall be performed prior to application of aluminum or metallic finish coats. Non-destructive holiday detector shall not exceed 67.5 volts nor shall destructive holiday detector exceed the voltage recommended by the manufacturer of the coating system. For thicknesses between 10 and 20 mils (250 microns and 500 microns) a non-sudsing type setting agent, such as Kodak Photo-Flo, shall be added to the water and detector sponge prior to detector use. All pinholes shall be marked and repaired in accordance with the manufacturer's printed recommendations and retested. No pinholes or other irregularities shall be permitted in the final coating.
- E. The Contractor shall furnish, until final acceptance of coating and painting, inspection devices in good working condition for detection of holidays and measurement of dry-film thickness of coating and paint. The Contractor shall also

furnish U.S. Department of Commerce, National Bureau of Standards certified thickness calibration plates to test accuracy of dry-film thickness gauge and certified instrumentation to test accuracy of holiday detectors.

- F. The Contractor shall require regular checks with these devices to insure dry-film thicknesses meet specifications. The Engineer shall at his discretion use the Contractors or his own equipment to perform similar inspections.
- G. Dry-film thickness gauges and holiday detectors shall be made available for the Engineer's use at all times until final acceptance of application. Holiday detection device shall be operated in the presence of the Engineer.
- H. Concrete surfaces in immersion service must have void - and pinhole-free coating application. Inspection of coating system with 5X magnification will provide these assurances.
- I. Warranty inspection shall be conducted during the eleventh month following completion of all coating and painting work. All defective work shall be repaired in accordance with this specification and to the satisfaction of the Engineer/Owner.
- J. In accordance with requirements set forth by regulatory agencies applicable to the construction industry and manufacturer's printed instructions and appropriate technical bulletins and manuals, the Contractor shall provide and require use of personnel protective lifesaving equipment for persons working in, or about the project site.
- K. Equipment shall include protective helmets that shall be worn by all persons while in the vicinity of the work. In addition, workers engaged in or near the work during sandblasting shall wear eye and face protection devices and air purifying, half-mask or mouthpiece respirator with appropriate filter. Barrier creams shall be used on any exposed areas of skin.
- L. Where ventilation is used to control hazardous exposure, all equipment shall be explosion proof. Ventilation shall reduce the concentration of air contaminant to the degree a hazard does not exist. Air circulation and exhausting of solvent vapors shall be continued until coatings have fully cured.
- M. Whenever the occupational noise exposure exceeds maximum allowable sound levels, the Contractor shall provide and require the use of approved ear protective devices.
- N. Adequate illumination shall be provided while work is in progress, including explosion-proof lights and electrical equipment. Whenever required by the Engineer, the Contractor shall provide additional illumination and necessary supports to cover all areas to be inspected. The level of illumination for inspection purposes shall be determined by the Engineer.

- O. All temporary ladders and scaffolding shall conform to applicable safety requirements. They shall be erected where requested by the Engineer to facilitate inspection and be moved by the Contractor to locations requested by the Engineer.
- P. All coatings and paints shall be stored in enclosed structures to protect them from weather and excessive heat or cold. Flammable coatings or paint must be stored to conform to City, Parish, State, and Federal safety codes for flammable coating or paint materials. At all times, coatings and paints shall be protected from freezing.

### 3.05 CLEAN UP

Upon completion of the work, all staging, scaffolding and containers shall be removed from the site or destroyed in a manner approved by the Engineer. Coating or paint spots and oil or stains upon adjacent surfaces shall be removed and the job site cleaned. All damage to surfaces resulting from the work of painting contractor or subcontractor shall be cleaned, repaired, or refinished to the satisfaction of the Engineer at no cost to the Owner.

**END OF SECTION**

## SECTION 09970

### COATING OF STEEL WATER STORAGE TANKS

#### PART 1 — GENERAL

##### 1.01 DESCRIPTION

- A. Contractor shall provide all labor, materials, equipment, and incidentals as specified and required to furnish and install all painting work related to the elevated steel storage tanks.
- B. The types of painting work include the painting and finishing of all items and surfaces throughout the project included in this Contract. Surface preparation, priming, and coats of paint specified are in addition to shop priming and surface treatment specified under other sections of the work.
- C. The term "paint" as used herein means all coating systems materials, which includes pretreatments, primers, emulsions, enamels, stain, sealers and fillers, and other applied materials whether used as prime, intermediate, or finish coats.
- D. Paint all exposed surfaces whether colors are designated in any schedule, except where the natural finish of the material is specifically noted as a surface not to be painted. The term "exposed" as used herein means all items not covered with concrete or buried below ground. Where items or surfaces are not specifically mentioned, paint these the same as adjacent similar materials or areas.
- E. Shop blast and apply prime coat to steel plate prior to shipping.

##### 1.02 REFERENCES

- A. Federal Test Method
  - 1. No. 141, Abrasion, Method 6192, CS-17 Wheel; 1000 grams load
  - 2. TT-C 550 C 4.4.5.2 and 4.4.5.3 Graffiti-resistance
- B. American Society of Testing and Materials (ASTM)
  - 1. ASTM D 4541-85; Adhesion - Elcometer Adhesion Tester
  - 2. ASTM D 3363-74; Hardness
  - 3. ASTM D 2247-68; Humidity
  - 4. ASTM B 117-73; Salt Spray (FOG)
  - 5. ASTM D 149; Dielectric Strength
  - 6. ASTM D 3359; Method B; Adhesion
  - 7. ASTM D 4585; Humidity (Controlled Condensation)
  - 8. ASTM D 4060; Abrasion-resistance
  - 9. ASTM D 522; Method 2; Flexibility
  - 10. ASTM G 53; QUV

11. ASTM D 3363; Pencil Hardness
  12. ASTM D 4141-C; EMMAQUA NTW, Weathering
- C. Steel Structures Painting Council (SSPC) Surface Preparation
1. SSPC SP-1 Solvent Clean
  2. SSPC SP-3 Power Tool Clean
  3. SSPC SP-6 Commercial Blast Cleaning
  4. SSPC SP-10 Near-White Blast Cleaning
  5. SSPC SP-11 Power Tool Clean to Bare Metal
- D. American Water Works Association
1. AWWA D 102
  2. AWWA C 652
- E. National Sanitation Foundation Standard 61/600

### **1.03 COORDINATION**

- A. Provide finish coats which are compatible with the prime paints used. Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of the total coatings system for the various substrates. Contractor shall be responsible for the compatibility of all shop primed and field painted items. Furnish information on the characteristics of the finish materials proposed to use, to ensure that compatible prime coats are used. Provide barrier coats over incompatible primers or remove and re-prime as required. Notify Engineer in writing of anticipated problems using the coating systems as specified with substrates primed by others.

### **1.03 QUALITY ASSURANCE**

- A. Source Quality Control: Obtain all materials from the same manufacturer unless otherwise approved. Obtain materials only from manufacturers who will:
1. Provide the services of a qualified manufacturer's representative at the project site at the commencement of work to advise on materials, installation, and finishing techniques.
  2. Certify long-term compatibility of all coatings with all substrates, both new and existing.
- B. Requirements of Regulatory Agencies: Coatings for surfaces in contact with potable water or water being treated for potable use shall not impart any taste or odor to the water, result in any organic or inorganic content in excess of the maximum contaminant level established by applicable laws or regulations and shall be approved for potable water use by National Sanitation Foundation. All such coatings shall be approved by the applicable regulatory agency.
- C. Manufacturer's Qualifications:

1. Specialize in manufacture of coatings with a minimum of 10 years successful experience.
  2. Able to demonstrate successful performance on comparable projects.
  3. Single Source Responsibility: Coatings and coating application accessories shall be products of a single manufacturer.
- D. Applicator's Qualifications:
1. Experienced in application of specified coatings for a minimum of 5 years on projects of similar size and complexity to this Work.
  2. Applicator's Personnel: Employ persons trained for application of specified coatings.

#### **1.04 SUBMITTALS**

- A. Submit for approval the following:
1. Copies of manufacturer's technical information, including paint label analysis and application instructions for each material proposed for use.
  2. List each material and cross-reference to the specific paint and finish system and application. Identify by manufacturer's catalog number and general classification.
  3. Copies of manufacturer's complete color charts for each coating system.
  4. Template for the repainting of tank's lettering and/or logo with overall and internal dimensions shown, and recommended colors.
  5. Pipe Markers: Copies of manufacturer's technical brochure, including color chart and list of standard markers.
  6. Maintenance Manual: Upon completion of the work, furnish copies of a detailed maintenance manual including the following information:
    - a. Product name and number
    - b. Name, address, and telephone number of manufacturer and local distributor
    - c. Detailed procedures for routine maintenance and cleaning
    - d. Detailed procedures for light repairs such as dents, scratches, and staining

#### **1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING**

- A. Delivery of Materials: Deliver all materials to the job site in original, new, and unopened packages and containers bearing manufacturer's name and label, and the following information:
1. Name or title of material
  2. Manufacturer's stock numbers and date of manufacture
  3. Manufacturer's name
  4. Contents of volume for major pigment and vehicle constituents
  5. Thinning instructions where recommended
  6. Application instructions

7. Color name and number
- B. Storage of Materials:
1. Store only acceptable project materials on project site.
  2. Store in a suitable location approved by Engineer. Keep area clean and accessible.
  3. Restrict storage to paint materials and related equipment.
  4. Comply with health and fire regulations including the Occupational Safety and Health Act of 1970.
- C. Handling of Materials.
1. Handle materials carefully to prevent inclusion of foreign materials.
  2. Do not open containers or mix components until necessary preparatory work has been completed and application work will start immediately.

## 1.06 JOB CONDITIONS

- A. Existing Conditions:
1. Before painting is started in any area, it shall be broom cleaned and excessive dust shall be removed.
  2. After painting operations begin, and prior to coating application, final cleaning shall be performed:
    - A. Interior Surfaces
      - i. An air mover shall be in place and in operation before cleaning begins.
      - ii. Broom clean and remove excessive dust from floor followed by cleaning with commercial vacuum cleaning equipment.
      - iii. The remainder of surfaces shall be blown with clean dry air. After blow down, surface shall be blown clean a second time in increments not exceeding 200 sq. ft. as painting progresses.
    - B. Exterior Surfaces: Cleaned surfaces shall be blown clean with clean dry air immediately prior to coating application.
- B. Environmental Requirements:
1. Apply all coatings in accordance with manufacturer's instructions.
  2. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85%; or to damp or wet surfaces.
  3. Painting may be continued during inclement weather only if the areas and surfaces to be painted are enclosed and heated within the temperature limits specified by the paint manufacturer during application and drying periods.
  4. Temperature of the surface shall be at least 5° above the dew point temperature. Each day's painting shall be completed well in advance of probable time of day when condensation will occur in order to permit the required film drying time prior to formation of moisture.



5. Illumination and air flow shall be provided in accordance with SSPC Guide 12. (20-foot candles and 10k cfm nominally).
  6. Install piping markers only after all painting and finish work has been completed.
- C. Protection: Cover or otherwise protect finished work of other trades and surfaces not being painted concurrently or not to be painted.

## **PART 2 — PRODUCTS**

### **2.01 MATERIAL QUALITY**

- A. Materials shall meet the requirements outlined in Section 2.02 and 2.03.
- B. All primers, intermediate coats and topcoats shall be furnished by the same manufacturer to ensure compatibility.
- C. All materials shall be delivered to the jobsite prior to the start of painting in new, sealed containers with appropriate manufactures labels and stored in a weatherproof structure.
- D. Use only thinners recommended by the paint manufacturer and use only to recommended limits.
- E. Provide paints and pipe markers of durable and washable quality. Use materials which will withstand normal washing as required to remove grease, oil, chemicals, etc., without discoloration, loss of gloss, staining, or other damage.

### **2.02 MATERIAL REQUIREMENTS**

- A. **Material Properties**
  1. Protective coatings for interior wet applications shall be certified in accordance with NSF/ANSI/CAN Std. 61 and the extraction requirements of NSF/ANSI/CAN 600.
  2. All coating utilized shall be certified “non-lead” (less than 0.06% lead by weight in the dried film) as defined in part 1303 of the consumer Product Safety Act.
  3. The coating manufacturer shall certify that the zinc dust used in the zinc coatings meets the requirement of ASTM D 520 Type III.

### **2.03 PERFORMANCE REQUIREMENTS**

- A. Polyurethane Zinc-rich Primer for Interior Surfaces
  1. ASTM D 870 Potable Water Immersion
    - a. Requirement: No blistering, cracking, rusting or any sign of failure after

- seven years.
    - 2. ASTM B 117 Salt Fog
      - A. Requirement: No blistering, cracking or delamination of film. No more than 1% rusting on plane and no more than 1/4" rust creepage at scribe after 20,000 hours.
- B. Epoxy for Interior Surfaces
  - 1. ASTM G 85 Prohesion
    - a. Requirement: No blistering, cracking, spot rust or delamination and no rust creepage at scribe after 10,000 hours.
  - 2. ASTM B117 Salt Fog
    - a. Requirement: 10,000 hours, No blistering, cracking, spot rust or delamination and no rust creepage at scribe.
- C. Polyurethane Zinc-rich Primer for Exterior Surfaces
  - 1. ASTM G 85 Prohesion
    - a. Requirement: No blistering, cracking, rusting or delamination of film. No more than 1/8" creepage at scribe after 10,000 hours.
  - 2. ASTM B117 Salt Fog
    - a. Requirement: No blistering, cracking, or delamination of film. No rust creepage at scribe after 10,000 hours exposure.
- D. Aliphatic Acrylic Polyurethane Intermediate Coat for Exterior Surfaces
  - 1. Test Method: ASTM D 4141 EMMAQUA
    - a. Requirement: No blistering, cracking, or chalking. No less than 86% gloss retention and .23 DED Hunter Lab Scale color change after 500 MJ/m<sup>2</sup> EMMAQUA exposure.
  - 2. Test Method: ASTM D 4587 QUV Exposure (UVA 340 bulbs, Cycle 4: 8 hours UV/4 hours condensation)
    - a. Requirement: No blistering, cracking, or chalking. No more than 2.6 MacAdam units color change after 2,000 hours exposure.
- E. Fluoropolymer Finish Coat
  - 1. Test Method: ASTM D 4141 EMMAQUA
    - a. Requirement: No blistering, cracking, or chalking. No less than 80% gloss retention after 3500 MJ/m<sup>2</sup> (128,951 MJ/m<sup>2</sup> total) EMMAQUA exposure.
  - 2. Test Method: ASTM D 4587 QUV Exposure (UVA 340 bulbs, Cycle 4: 8 hours UV/4 hours condensation)
    - a. Requirement: No blistering, cracking, or chalking. No less than 60% gloss retention and 1.89 MacAdam units color change after 25,000 hours exposure.
  - 3. Volume Solids
    - a. Requirement: No less than 60% volume solids.
- F. Manufacturer: Tnemec, or equal meeting performance criteria.

## 2.04 COLORS AND FINISHES

- A. Surface treatment and finishes are shown under "Painting Systems" below. All substrates scheduled under "Painting Systems" shall be painted whether or not shown on the Drawings or in schedules, unless an item is specifically scheduled as not requiring the painting system scheduled below.
- B. Color Selection:
  - 1. Owner reserves the right to select non-standard colors for all paint systems specified within the ability of the manufacturer to produce such non-standard colors. Selection of non-standard colors shall not be cause for Contractor rejecting Owner's color selections and Contractor shall provide such colors at no additional expense to the Owner.
  - 2. Each specified coat of paint shall be of a contrasting color sufficient to clearly distinguish one coat from the preceding coat. Should the applicator choose an application method that requires multiple applications (such as roller application of 2 intermediate coats to achieve specified film thickness) each shall be of contrasting color. This requirement does not apply to touch-ups where square footage is less than 200 sq. ft in any given location.
- C. After approval of submittals and prior to beginning work, Engineer will furnish color schedules for surfaces to be painted listed in the painting systems below.
- D. Color Coding: In general, and unless otherwise specified, all color coding of piping, ducts and equipment shall comply with applicable standards of ANSI A13.1 and OSHA 1910.144.
- E. Use representative colors when preparing samples for Engineer's review.
- F. Color Pigments: Pure, nonfading, applicable types to suit the substrates and service indicated.
  - 1. Lead: Lead content shall not exceed amount permitted by federal, state, and local government laws and regulations.
  - 2. Paints specified for application in contact with potable water shall be approved by the United States Environmental Protection Agency and the National Sanitation Foundation.
- G. Submit proposed application techniques to Engineer. Submit proof of acceptability of technique proposed by the paint manufacturer selected.

## 2.05 PAINTING SYSTEMS

- A. Interior Wet:
  - 1. Surface Preparation: SSPC-SP 10 Near White Metal Blast Cleaning as

specified in 3.02, to achieve a minimum 1.5 angular surface profile.

		Min.-Max.
First Coat	Zinc-Rich Primer	2.5-3.5 dry mils
Stripe Coat	Polyamidoamine Epoxy	
Second Coat	Phenalkamine Epoxy	6.0-8.0 dry mils
Third Coat	Phenalkamine Epoxy	6.0-8.0 dry mils
	Total	14.5-19.5 dry mils

Caulk all lap seams with Sika Flex 1-A or equal after the application of the interior coating system. Follow manufacturer's recommendation for bead width and fillet contour. Minimum radius shall be ¼".

B. Interior Dry:

1. Surface Preparation: See Paragraph 3.02.

		Min.-Max.
First Coat	Zinc-Rich Primer	2.5-3.5 dry mils
Stripe Coat	Polyamidoamine Epoxy	
Second Coat	Phenalkamine Epoxy	6.0-8.0 dry mils
	Total	8.0-12.0

C. Exterior

1. Surface Preparation: See Paragraph 3.02

		Min.-Max.
First Coat	Zinc-Rich Primer	2.5-3.5 dry mils
Stripe Coat	nuts, bolts, ladder rungs and sharp edges with Polyamidoamine Epoxy	
Second Coat	Aliphatic Acrylic Polyurethane	2.0-3.0 dry mils
Third Coat	Fluoropolymer	<u>2.5-3.0 dry mils</u>
	Total	7.0-9.5 dry mils

## PART 3 — EXECUTION

### 3.01 INSPECTION

A. General:

1. Applicator shall be responsible for and maintain an active quality control program, monitored by the applicators inspector who shall be knowledgeable of coating inspection methods, test procedures and corrective measures for items found to be in nonconformance. The quality control program shall insure and document compliance with the job specifications in all facets of surface preparation, coating and lining application, cure and final inspection.
2. The applicator shall provide the engineer with documentation of inspections and testing performed. The documentation shall include weather conditions

at the start and end of each application, test results and specific locations examined to confirm.

3. Applicator shall correct work that is not acceptable, verify corrective actions have been completed and submit documentation of such inspection prior to requesting an audit.
4. Audits may be performed by the engineer, or a party designated by the engineer to confirm that inspections have been performed in a thorough and proper manner.
5. Perform holiday test on interior wetted surfaces (below the top elevation of the overflow nozzle) per NACE SP-188. Wetting agent shall be added to the test solution.
6. Inspector must have NACE 1 (minimum) certification.

B. Applicator's Inspector shall verify:

1. Only paint and painting materials as specified shall be delivered to the jobsite and used for this project.
2. Paint shall be delivered in unbroken containers bearing the designated name, specification number, color, directions for use, manufacturer, and date of manufacture.
3. All manufacturer's instructions shall be carefully followed in the preparation, application, curing or drying and handling of the paint.
4. Each coat of paint shall be applied in different contrasting colors.
  - i. The same color may be used for spot touch-up of areas 10 sq. ft. or less.
  - ii. For larger areas a contrasting color shall be selected.
5. Compressor air supply is clean and free of contaminants prior to start of blast cleaning per ASTM D4285 blotter test on a daily basis.
6. Verify DFT of each coat and total DFT of each coating system is as specified using wet film and dry film gauges. Dry film thickness measurements shall be performed per SSPC PA-2 including gage calibration to compensate for surface profile.
  - i. A minimum of 5 spot readings are required per sample area.
  - ii. If any one of the readings falls below the specified minimum, 2 additional 1-1/2" diameter spots shall be selected and measured.
  - iii. If all 3 spot readings are no less than 80% of the specified minimum thickness, the lowest spot measurement shall be selected for the 5-spot average of the 100 sq. ft. test area.
  - iv. Any spot measurement less than 80% of specified minimum shall be investigated with sufficient measurements taken to define the affected area requiring repair.
  - v. Spot measurements of beams, channels and angles shall be performed in accordance with SSPC-PA2 Appendix 3.
    1. 10% of all clips, stiffeners and other attachments shall have 2 spot measurements.
    2. Any attachment spot measurement below the minimum thickness defined above shall require measurement of a

minimum of two additional attachments.

7. Verify each coat of paint is properly cured per ASTM D 4752.
8. Coating Defects: Visually examine coatings for film characteristics or defects that would adversely affect performance or appearance of coating including dust, dirt or overspray, inclusions, runs, sags, pinholes, blisters, finish coat overspray, mud cracks, and even in color and appearance.
9. Report:
  - a. Submit written reports describing inspections made and actions taken to correct nonconforming work. Legible handwritten field reports and sketches are suitable for this purpose.
  - b. Report nonconforming work not corrected.
  - c. Submit copies of report to Engineer or Engineer's designated representative within 5 working days.
10. Inspection Documentation - Inspector shall record:
  - a. Environmental conditions, at the beginning of each daily operation, thirty minutes before painting begins and every hour during painting operations, on the attached Environmental Conditions Report.
  - b. Daily record of compressor air sampling prior to start of work.
  - c. Surface preparation: Daily verify and define each area approved for each coat prior to application.
  - d. Visual examination of each coat of paint.
  - e. Film thickness survey. Provide map or sketch and tabulation of readings.

C. Quality Assurance Audit.

1. Contractor shall verify surface preparation and application are as specified at all specific audit hold points as outlined in e. below and at other points as directed by the engineer prior to a scheduled audit.
2. Inspector shall have pertinent inspection documentation available for review at time of scheduled audits.
3. If independent inspection audit determines noncompliance:
  - a. Owner is responsible for the first additional trip to verify deficiencies have been corrected.
  - b. Surface preparation: Contractor will be required to provide a minimum of 1500 square feet of prepared and inspected surface area prior to scheduling an audit.

4. Hold Points: See paragraph 3.05 K “Hold Points”

Note 1: Nonconformance discovered during quality assurance audit may at the Owners discretion require performance of additional hold point audit or audits to establish compliance.

Note 2: Applicator shall notify the owner 48 hours prior to the anticipated need for hold point audits.

Note 3: Staging and/or scaffolding used for the work shall not be removed before the work has been examined by the auditor.

D. Manufacturer’s Field Services: Manufacturer’s representative shall provide technical assistance and guidance for surface preparation and application of coating systems.

### 3.02 SURFACE PREPARATION

A. General:

1. Perform all preparation and cleaning procedures as specified herein and in strict accordance with the paint manufacturer's instructions for each particular substrate and atmospheric condition.
2. Remove all hardware, hardware accessories, machined surfaces, instrumentation, nameplates, lighting fixtures, and similar items in place and not to be finish painted or provide surface applied protection prior to surface preparation and painting operations. Remove, if necessary, for the complete painting of the items and adjacent surfaces. Following completion of painting of each space or area, remove masking and reinstall the removed items by workmen skilled in the trades involved.
3. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease with clean cloths and cleaning solvents prior to mechanical cleaning. Program the cleaning and painting so that dust and other contaminants from the cleaning process will not fall in wet, newly painted surfaces.
4. All surfaces which were not shop painted or which were improperly shop painted, and all abraded or rusted shop painted surfaces, which are to be painted, as determined by Engineer, shall be prepared as specified below.
5. Fabrication Defects:
  - a. Correct steel and fabrication defects revealed by surface preparation.
  - a. Remove weld spatter and slag.
  - b. All welds shall be ground to a smooth contour as per NACE Standard RP0178, Designation D for Lap, Butt and Fillet Welds.
  - c. Smooth weld undercuts and recesses.
  - d. Grind down porous welds to pinhole-free metal.

B. Non-Ferrous Metal Surfaces: Clean non-ferrous metal surfaces in accordance with the coating system manufacturer's instructions for the type of service, metal

substrate, and application required.

C. Galvanized Surfaces:

1. Clean free of oil and surface contaminants with a non-petroleum-based solvent, recommended by the coating manufacturer, complying with SSPC-SP 1.
2. Brush-off blast all surfaces to be coated to remove all insoluble surface contaminants and achieve a uniformly profiled surface.

D. Interior Coating System Surface Preparation:

1. Wet and Dry Areas: Remove all visible oil, grease, soil, dirt and other soluble contaminants in accordance with SSPC SP1. Weld slag, weld spatter, rough edges and sharp edges of weld seams shall be ground smooth. All surfaces shall be abrasive-blast cleaned to a Near-White finish in accordance with SSPC SP10 (NACE #2) Near White Metal Blast Cleaning. A surface profile of 1.5 to 2.0 mils is required.

E. Exterior Coating System Surface Preparation

1. Remove all visible oil, grease, soil, dirt and other soluble contaminants in accordance with SSPC SP1. Weld slag, weld spatter, rough edges and sharp edges of weld seams shall be ground smooth. All surfaces shall be abrasive blast cleaned in accordance with SSPC SP6 Commercial Blast Cleaning. A profile of 1.5-2.0 mils is required.

F. Containment and Disposal

1. Surface Preparation Debris Containment - When completely blasting and repainting, the entire tank structure shall be enclosed with a containment system that is SSPC Class 2 or better to properly contain debris and emissions. Refer to SSPC-Guide 6 (CONO, Guide for Containing Debris Generated During Paint Removal Operations).
2. All fallout and associated damage occurring during the installation shall be the responsibility of the contractor.
3. Containment/Disposal Costs - The painting contractor shall be responsible for all costs associated with containment and waste disposal that may result from the execution of this project.

### **3.03 MATERIALS PREPARATION**

- A. Mix and prepare painting materials in strict accordance with the manufacturer's directions.



- B. Do not mix coating materials produced by different manufacturers, unless otherwise permitted by the manufacturer's instructions.
- C. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing, and application of paint in a clean condition, free of foreign materials and residue.
- D. Stir all materials before application to produce a mixture of uniform density, and as required during the application of the materials. Do not stir any film which may form on the surface into the material. Remove the film and, if necessary, strain the material before using.
- E. Mixing:
  - 1. Mix only in containers placed in suitable sized non-ferrous or oxide resistant metal pans to protect concrete floor from splashes or spills which could stain exposed concrete or react with subsequent finish floor material.
  - 2. Mix and apply paint only in containers bearing accurate product name of material being mixed or applied.

### **3.04 APPLICATION**

- A. General:
  - 1. Apply paint by brush, roller, air spray, or airless spray in accordance with the manufacturer's directions and recommendations of Paint Application Specifications No. 1 in SSPC Vol. 2, where applicable. Use brushes best suited for the type of material being applied. Use rollers of carpet, velvet back, or high pile sheep's wool as recommended by the paint manufacturer for material and texture required. Use air spray and airless spray equipment recommended by the paint manufacturer for specific coating system specified. Submit a list of application methods proposed, listing paint systems and location.
  - 2. The paint film thickness required is the same regardless of the application method. Do not apply succeeding coatings until the previous coat has completely dried. Uniformly apply coatings at spreading rate required to achieve specified DFT.
  - 3. Apply additional coats when undercoats, stains, or other conditions show through the preceding coat of paint, until the paint film is of uniform finish, color and appearance. This is of particular importance regarding intense primary accent colors. Ensure that all surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a film thickness equivalent to that of flat surfaces.
  - 4. Surfaces not exposed to view do not require color coding but require the same coating system specified for exposed surfaces. "Exposed to view surfaces" is defined as those areas visible when permanent or built-in fixtures convactor covers, covers, covers for finned tube radiation, grilles, etc. are in

place in areas scheduled to be painted.

5. Omit field primer on metal surfaces which have been shop primed.
  6. All lap seams, joints, crevices, bolt holes, gaps along supports and plates, intersections of structural members, painter's ring joints, and other locations that may be susceptible to corrosion above the water fill line at tank interior, and entirety of tank exterior, shall be sealed with Sika-Flex 1-A (or equivalent) flexible caulk joint sealant in accordance with manufacturer's written instructions after the final coating system has been applied. Particular attention to bead size and contour recommended by the manufacturer shall be observed.
- B. Minimum Coating Thickness:
1. Apply each material at not less than the manufacturer's recommended spreading rate and provide total dry film thickness as specified.
  2. Apply extra coat if required to obtain specified total dry film thickness.
- C. Scheduling Painting:
1. Apply the first-coat material to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
  2. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
- D. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage.

### 3.05 TESTING

- A. The Owner will procure and pay separately for an independent coating inspector to audit and confirm that routine inspections were properly performed at specific hold points. The Contractor shall coordinate with the independent inspector and grant full access to the work at all times.
- B. Adhesion testing shall be performed by the manufacturer in the presence of the Owner on steel plate shop primed and delivered to the site on a random basis. When primer does not achieve the greater of 80% of the manufacturer's published adhesion value or 800 psi, the steel component shall be blasted clean and coated in accordance with the specifications prior to incorporation in the work. A single failure shall be grounds for testing of all individual steel sections.
- C. Contractor shall furnish a surface temperature gage and sling psychrometer maintained in good working condition during all painting activities.
- D. Contractor shall maintain a log documenting component painted, material applied,

time of application, weather conditions, substrate temperature and time of completion for each time coating is applied to the structure.

- E. Thickness of coatings and paint shall be checked with a non-destructive, magnetic-type thickness gauge, as per SSPC-PA 2 "Measurement of Dry Film Thickness with Magnetic Gages". References in PA 2 which allow 80% of the minimum thickness specified are not acceptable. Use an instrument such as a Tooke Gauge if a destructive test is deemed necessary by the Engineer.
- F. The Contractor shall furnish an "Elcometer" as distributed by Gardner Laboratories, Bethesda, MD, or a "Mikrotest", as distributed by the Nordsen Equipment Company, Amherst, Ohio, to the Engineer to check dry mil thickness. The thickness gauge is to come with a carrying case and operating instructions.
- G. The Contractor shall provide a Tinker and Razor M-1 or equal Holiday tester maintained in good working order.
- H. Primer coat thickness shall be checked by the Contractor and verified by the Engineer before subsequent coats may be applied.
- I. All interior surfaces shall be low voltage tested in accordance with NACE SP0188 in the presence of the owner or owner's representative. All failed areas shall be touched-up in accordance with manufacturer's instructions and retested until all surfaces pass the test.
- J. Contractor shall submit manufacturer's recommended repair procedure for approval prior to holiday testing.
- K. HOLD POINTS: The Contractor shall provide no less than 24-hour notice to Owner in advance of desired inspection, so that the independent coating inspector may observe key stages in the work. Until approval is granted, the Contractor may not progress to the next phase of coating application. Reinspection for correction of substandard work shall be at the Contractor's expense after the first reinspection for the same defect. Delay due to improper notice or miscommunication shall not be grounds for additional compensation. Inspection audits shall be at the following points:
  - 1. Completed blast prior to field primer application at welds.
  - 2. Completed primer and stripe coat application prior to intermediate coat application.
  - 3. Final coating completion inspection for total millage.

### **3.06 PROTECTION**

- A. Protect work of other trades, whether to be painted or not, from the work of this section. Leave all such work undamaged. Correct all damages by cleaning, repairing or replacing, and repainting, as acceptable to Engineer.
- B. Provide "Wet Paint" signs as required to protect newly painted finishes. Remove all temporary protective wrappings provided for protection of this Contract and other contracts after completion of painting operations.
- C. Shrouding is not explicitly required, but the contractor shall be liable for any effects of overspray.

### **3.07 CLEAN-UP**

- A. During the progress of the work, remove from the site all discarded paint materials, rubbish, cans and rags at the end of each workday.
- B. Upon completion of painting work, clean all paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- C. At the completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces as determined by Engineer.
- D. All debris generated during work activities shall be removed from the site at completion of work and disposed of in accordance with applicable State and Federal regulations.

### **3.08 STERILIZATION**

- A. Allow a minimum of seven days curing after application of final coat to tank before flushing, sterilizing or filling with water.
- B. The interior of the structure and riser shall be thoroughly hand-washed and sterilized in accordance with the requirements of the state health department and latest version of AWWA C 652.
- C. Bacteriological samples shall be taken and sent to the appropriate health department for testing. If the results are positive, the structure shall be re-sterilized as set out herein until negative test results are obtained.
- D. The structure shall not be placed into service until negative results are obtained.

### **3.09 GUARANTEE**

- A. The applicator shall guarantee his work for a period of one year warranty to the

extent that applicator shall repair any defects due to faulty workmanship or materials, which may appear on the structure during this period.

- B. The guarantee shall commence on the date bacteriological sampling has produced negative results and the tank is put into service.
- C. The owner will notify the applicator in writing within 15 working days of any intended inspection date.
- D. Any required repairs shall be performed in accordance with this specification.
- E. If internal repairs are required, the applicator shall include cleaning and sterilization in accordance with Section 3.08 of this specification.

**\* \* END OF SECTION \* \***

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**SECTION 13400**  
**MAGNETIC FLOW METERS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

A. Scope:

1. Under this item, the contractor shall furnish and install the flow measurement equipment and accessories as indicated on the plans and as herein specified.
2. System to be complete and operational with all control equipment and accessories as shown and specified.

B. Related Sections

Section 13423 - Analysis and Instrumentation

**1.2 REFERENCES**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.
1. ASME B16.1 (2015) Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250
  2. ASME B16.5 (2013) Pipe Flanges and Flanged Fittings: NPS 1/2 Through NPS 24 Metric/Inch Standard
  3. NEMA 250 (2014) Enclosures for Electrical Equipment (1000 Volts Maximum)
  4. NEMA ICS 1 (2000; R 2015) Standard for Industrial Control and Systems: General Requirements
  5. NEMA ICS 2 (2000; R 2005; Errata 2008) Standard for Controllers, Contactors, and Overload Relays Rated 600 V
  6. NFPA 70 (2017) National Electrical Code
  7. NSF/ANSI 61 (2016) Drinking Water System Components – Health Effects
  8. NAPHCC NSPC (2015) National Standard Plumbing Code UL 50 (2007; Reprint April 2012) Enclosures for Electrical Equipment, Non-environmental Considerations.

### 1.3 DEFINITIONS

- A. Amplifier – Device used for increasing the power of a signal. It does this by taking energy from a power supply and controlling the output to match the input signal shape but with larger amplitude.
- B. ANSI – (American National Standards Institute) A private non-profit organization that oversees the development of voluntary consensus standards for products, services, processes, systems, and personnel in the United States. The organization also coordinates U.S. standards with international standards so that American products can be used worldwide.
- C. AWWA – (American Water Works Association) An international non-profit professional organization founded to improve water quality and supply.
- D. Detector Coils – Also called an “induction loop”, an electromagnetic communication or detection system which uses a moving magnet to induce an electrical current in a nearby wire.
- E. Electrode – An electrical conductor used to make contact with a nonmetallic part of a circuit (e.g., a semiconductor, an electrolyte or a vacuum).
- F. Modbus RTU – a serial communications protocol published by Modicon (now Schneider Electric) in 1979 for use with its programmable logic controllers (PLCs). This is used in serial communication & makes use of a compact, binary representation of the data for protocol communication.
- G. NEMA – (National Electrical Manufacturers Association) Is the 'Association of Electrical Equipment and Medical Imaging Manufacturers' in the United States. Its approximately 450 member companies manufacture products used in the generation, transmission, distribution, control, and end use of electricity. These products are used in utility, industrial, commercial, institutional, and residential applications.
- H. NSF International – An independent, accredited organization that develops standards, and tests and certifies products and systems. They provide auditing, education and risk management solutions for public health and the environment.
- I. PLCs – (Programmable Logic Controller) A digital computer used for automation of electromechanical processes, such as control of machinery on factory assembly lines, amusement rides, or light fixtures. PLCs are used in many industries and machines.
- J. PTFE – (Polytetrafluoroethylene) A synthetic fluoropolymer of tetrafluoroethylene that finds numerous applications. The best-known brand name of PTFE is Teflon by DuPont Co.
- K. Serial Communications – In telecommunication and computer science, serial communication is the process of sending data one bit at a time, sequentially, over a communication channel or computer bus. This is in contrast to parallel communication, where several bits are sent as a whole, on a link with several parallel channels.



## 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect from damage, deterioration, weather, excessive humidity, excessive temperature variation, dirt, dust, and contaminants equipment and materials delivered, handled, and placed in storage, from the time of shipment until installation is completed and the equipment and materials are ready for operation. Equipment shall be marked and stored to permit easy identification and inspection. Each item of the equipment shall be tagged or marked as identified in the delivery schedule or on the shop drawings. Include with each shipment complete packing lists and bills of materials.

## 1.5 QUALITY ASSURANCE

### A. Requirements

1. Perform calibration and submit test report for the flow measuring equipment for closed channel; Accuracy shall be +/- 0.4 % of rate for all flow rates greater than 1.9 feet per second. Calibration shall be in accordance with OIML R49 Type P standards.
  2. The products of this section shall be provided by a single supplier who shall demonstrate previous experience in the manufacture of flow measuring systems.
  3. The manufacturer must have a service center with trained technicians authorized to make repairs to all components of the flow measuring system. This supplier shall be responsible for providing all equipment, accessories, spare parts, documentation, and installation supervision required for a complete and operational flow measuring system.
- B. The flow meters and accessories shall be a regularly marketed product of the manufacturer who must have a physical plant, technical and design staff, and production personnel to complete the work as Specified. Systems assembled by second party fabricators, integrators, Equipment distributors/representatives or contractors shall not be acceptable. The flow meters and accessories shall be assembled and tested by the manufacturer prior to delivery.
  - C. The manufacturer shall have a minimum of 5 years' experience with a successful record of manufacturing and servicing of systems as specified herein.
  - D. The manufacturer shall have a proven track record of after-market sales and service support on its equipment.
  - E. Emergency Service: System manufacturer or manufacturer representative maintains service center capable of providing training, parts, and emergency maintenance and repairs at Project site with 48 hours maximum response time.
  - F. Single-Source Responsibility: Obtain flow meters and accessory components from a single manufacturer with responsibility for entire system. Unit shall be representative product built from components that have proven compatibility and reliability and are coordinated to operate as unit as evidenced by records of prototype testing.

## 1.6 SUBMITTALS

A. The following information shall be included in the submittal for this section:

1. Detailed Bill of Materials for all equipment and components, listing: manufacturer's name, quantity, size, description, and catalog/part number.
2. Manufacturer's product literature, specifications, performance capabilities, features and accessories, materials of construction, illustrations, and data in sufficient detail to demonstrate compliance with Specification requirements. Manufacturer's literature and data shall be marked to clearly delineate all applicable information and crossing out all inapplicable information.
3. Outline dimensions, conduit entry locations and weight.
4. Customer connection and power wiring diagrams.
5. Data sheets and catalog literature for microprocessor-based transmitter and transducer
6. Interconnection drawings. Electrical wiring schematics for flow sensor and signal converter/amplifier/transmitter. Interconnection wiring diagrams between signal converters /transmitters and related equipment and materials.
7. Diagrams showing meter grounding recommendations and grounding conductor/connection requirements (conductor size and connection type), including connection from meter terminal box or signal converter (if integrally mounted) to grounding ring(s), connection rod between grounding rings, and connection from grounding rings to ground rod.
8. Meter cable product data sheets.
9. Installation and operations manual.
10. List of spare parts.
11. A complete list of options provided along with a full listing of available options. Include a listing of available options not provided, but recommended along with an statement justifying their recommendation for inclusion.
12. Any portions of this specification not met must be clearly indicated or the supplier and Contractor shall be liable to provide all additional components required to meet this specification at no additional cost to the project.
13. The proposed manufacturer's guarantee and local parts/service center information.
14. Operation and Maintenance Manual information.
15. Maintenance Proposal - Provide for the Owners' consideration a proposal for professional annual maintenance/calibration of the flow meter and accessories. This proposal shall include the services of a qualified technician to perform maintenance and calibration as recommended by the manufacturer. The proposal shall include a schedule of services to be performed.

16. List of special tools for each type of equipment furnished including special tools necessary for adjustment, operation, maintenance, and disassembly.

## **1.7 WARRANTY**

- A. The equipment furnished under this section shall be free of defects in material and workmanship, including damages that may be incurred during shipping for a period of 24 months from date of substantial completion.
- B. The system manufacturer shall pass through any warranties from the equipment suppliers for the meter and other system components manufactured by others.

## **1.8 COORDINATION**

- A. Flowmeters and control systems shall be designed and coordinated for proper operation with related equipment and materials furnished by other suppliers and manufacturers under other sections of these Specifications and where applicable, with related existing equipment. All flowmeter and control devices shall be applied in full conformity with the Construction Drawings and Specifications, and with the instructions and recommendations of the flowmeter manufacturer and the related equipment manufacturer.
- B. Related equipment and materials may include, but not be limited to valve actuators, chemical feed equipment, analytical measuring devices, supervisory control equipment (SCADA), telemetry, conduit, cable, and piping, as described in other Sections associated with the project and shown on the Drawings.
- C. Interconnection wiring diagrams shall be prepared between the related equipment and the equipment furnished under this Section. Interconnection wiring shall provide all functions specified herein and/or shown on the Drawings.

## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

- A. Magnetic flow meters shall measure, indicate, and transmit process flow in a full pipe. Meter must be a full-bore meter with the magnetic field traversing the entire cross-section of the flow tube. Insertion magmeters or multiple single point probes inserted into a spool piece are not acceptable.
- B. Type: Magnetic flowmeter, operating based on Faraday's law, using a pulsed dc type coil excitation with high impedance electrodes.
- C. Parts: Flow tube, transmitter, interconnection cables
- D. Meter model shall be recommended by manufacturer for adjacent fittings and bends, with 0 upstream and 0 downstream diameters.

## 2.2 MANUFACTURER

- A. Subject to compliance with requirements of this specification, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Emerson (Rosemount Magnetic Meters)
  - 2. ABB
  - 3. Or Approved Equal.
- B. Manufacturers shall modify or supplement standard equipment to provide all features and capabilities specified herein.

## 2.3 GENERAL REQUIREMENTS

- A. The flow measuring equipment shall be the electromagnetic meter full bore type. The design shall permit ease of installation and shall not have any features hazardous to personnel or detrimental to the equipment. Provision shall be made to align and adequately lubricate moving parts. Interior parts shall be easily accessible for adjustment, repair, and replacement.
- B. Provide a magnetic flow meter where indicated on the Construction Drawings. The magnetic flow meter shall be suitable for pipe diameters up to 24 inches.
- C. The magnetic flow meter system shall include a flow tube, semi-remote read-out receiver, remote transmission, and interconnecting cable where indicated.
- D. The flow meter shall be a tetrafluoroethylene-lined stainless steel or steel chloroprene-lined stainless steel or steel or fiberglass tube with the necessary cores and coils to provide a magnetic field without any interference and with 150 psi modified ASME B16.1 carbon steel flanges.
  - a. Electrodes shall be the conical self-cleaning stainless steel.
  - b. The tube shall operate from 120 volts, 60 hertz, single phase AC power.
- E. A weatherproof housing shall cover the magnets, coils, and connections. Provide a transformer within the transmitter housing to provide 120 volts power to the receiver.
- F. Provide a system for cleaning the electrodes or tube automatically without taking the tube out of service.
- G. The metering tube shall have an approximate laying length as indicated.
- H. Provide all necessary cable between the transmitter and receiver.
- I. Accuracy shall be +/- 0.4 % of rate for all flow rates greater than 1.9 feet per second or as noted otherwise within these specifications. The receiver shall convert the AC voltage signal generated in the flow tube to a uniform flow signal. There shall be an adjustment for zero and span.

## 2.4 DESIGN, CONSTRUCTION AND MATERIALS OF FABRICATION

### A. Flow Sensor

1. Each flow sensor shall be provided with a flanged end flow tube and a non-conductive liner suitable for the liquid being metered. Unless specified otherwise, the flow tube shall be constructed of Type 304 or Type 316 stainless steel with stainless steel or carbon steel flanged ends. Flanges shall be ANSI Class 150 for meter sizes up to 24 inches. Flow sensors shall be provided with Teflon liner material.
2. The field coils of the flow sensor shall be supplied with a precisely adjusted bipolar direct current. Coil drive power shall be supplied by the signal converter/amplifier/transmitter. The output signal from the flow sensor shall be fed through cable to the signal converter/amplifier/transmitter. There shall be no electronic components in the flow sensor.
3. The flow sensor coil enclosure and cable connection housing shall be epoxy coated steel or epoxy coated aluminum. Plastic housings will not be acceptable.
4. Meters installed underground or in a below grade vault shall be manufactured to NEMA 6P standards to enable the meter to be submerged up to 30 feet for 48 hours and up to 10 feet with continuous submersion. Meters rated NEMA 6P shall have remote transmitters in separate NEMA 4X enclosures. The interconnecting cables shall be installed at the factory and the termination box filled with a non-setting, transparent potting material.
5. When installed in metallic piping, the flow sensor shall be provided with integral grounding electrodes. When installed in lined or non-metallic piping, the flow sensor shall be provided with Type 316 stainless steel grounding rings or grounding electrodes.
6. When installed in piping conveying raw sewage or sludge, the flow sensor shall be certified for use in Class I, Division 2 hazardous locations.
7. Flow sensor grounding electrode and sensing electrode material shall be compatible with the process fluid. Unless specified otherwise, electrodes shall be constructed of Type 316 stainless steel or Hastelloy C.
8. The flow sensor, including liner material, shall be certified in accordance with National Sanitation Foundation Standard 61 for use with potable water. Accuracy shall not be affected by cuts or scratches in the flow sensor liner.
9. The flow sensor shall be provided with multiple sensing electrodes to accurately measure mean velocity. The flow sensor shall be capable of accurately measuring slurries and water with entrained air. Accuracy of the flowmeter system shall be  $\pm 0.2\%$  of rate. Accuracy shall be traceable to the US National Institute of Standards and Technology (NIST) and shall be guaranteed on-site for applications such as drinking water, raw sewage, and similar media, even with a permanent coating of raw sewage or similar on the electrodes. A NIST traceable calibration certificate shall be provided with each flowmeter.

10. The flow sensor shall incorporate an empty pipe detection feature, which shall cause the meter to register zero flow when the sensor is not full.
11. Unless specified otherwise, the flow sensor shall be rated for a minimum working pressure of 150 psig.
12. The flow sensor shall be suitable for operating temperatures ranging from -4°F to +122°F (minimum).
13. The measuring system shall be capable of measuring the volumetric flow rate of liquids having an electrical conductivity as low as 5.0 micromhos per centimeter.

#### C. Signal Converter/Amplifier/Transmitter

1. Unless specified otherwise, the signal converter/amplifier/transmitter shall be remote mounted from the flow sensor. Where special signal cable is required and recommended by the manufacturer, the cable shall be supplied by the meter manufacturer. Supplier shall confirm the length and installation requirements. Where signal converter/amplifier/transmitter location is not shown on the Drawings, each flowmeter shall be furnished with a minimum of 200 feet of signal cable.
2. The signal converter/amplifier/transmitter shall be suitable for outdoor exposure and shall be rated NEMA 4X.
3. Display: Three line back-lit graphical display with capacitive keys; allows for external configuration without removing covers and compromising the integrity of environmental classifications.
  - a. Programmable parameters of the converter/amplifier/transmitter include, but are not limited to: calibration factors, totalizer resets, unit of measure, analog and pulse output scaling, flow-alarm functions, language selection, low-flow cutoff, noise dampening factor and excitation frequency selection.
  - b. The signal converter/amplifier/transmitter shall be program selectable to display the following units of measure: U.S. gallons, imperial gallons, million gallons (U.S.), cubic feet, cubic meters, liters.
4. The signal converter shall be coordinated with the flow sensor selection for accurately measuring potable water, raw sewage, slurries, and water with entrained air.
5. The signal converter/amplifier/transmitter shall be capable of measuring bi-directional flow and shall have three separate totalizers.
6. The signal converter/amplifier/transmitter shall operate on 85 to 265 VAC, or 11 to 24 VAC supply power.
7. The signal converter/amplifier/transmitter shall include non-volatile memory capable of storing all programmable data and accumulated totalizer values in the event of a power interruption.

8. The signal converter/amplifier/transmitter shall produce a 4-20 mA DC output signal into a minimum load of 800 ohms, linear to flow. Output shall be selectable as unidirectional or bi-directional. In addition, the signal converter/amplifier/transmitter shall provide a digital scaled pulse output for external display/recording of flow rate and total flow.
  - a. Provide for future expandability for future communication with existing Mission System.
    - 1) In the future, the following alarms may be required to be communicated to the plant's existing Mission System:
      - a) Flow meter failure alarm.
9. The signal converter/amplifier/transmitter shall be provided with a positive zero circuit to register zero flow.
10. The signal converter/amplifier/transmitter shall be suitable for operation in ambient temperatures ranging from -4°F to +140°F (minimum).
11. Where located indoors, the signal converter/amplifier/transmitter shall be wall mounted or flush panel door mounted as indicated on the Drawings.
12. Redundant data storage in sensor and transmitter with continuous replication of calibration factors, meter size, serial numbers, and site-specific settings.
13. Infrared service port for meter configuration and diagnostic interrogation. Shall have capability to connect to laptop. Shall be able to configure as keypad image, Hart or HyperTerminal. Shall be able to perform remote trouble shooting from remote location with computer laptop packages such as PC anywhere.
14. Where specified, local service communication with the meter shall be capable via a RJ-45 port and an Ethernet cable regardless of the output. The signal converter/amplifier/ transmitter shall have integral webserver capabilities with a unique IP address.

## **2.5 EQUIPMENT APPURTENANCES**

- A. Bolts, nuts, anchors, washers, and all other types of supports necessary for the installation of the equipment shall be Hastelloy, titanium or Type 316 stainless steel.

## **2.6 SPARE PARTS**

- A. Provide all standard recommended spare parts as specified in the manufacturer's instruction manuals for each component in the system. Spare parts shall include all parts required for (2) years of normal maintenance of all components of the flow measuring system. All parts shall be in one box and identified with labels describing contents.

## **PART 3 - EXECUTION**

### **3.1 GENERAL**

- A. All components of the Flow Measuring system shall be handled with care during transportation, storage and installation. In case of doubt, the Contractor shall follow the manufacturer Guidelines for Storage and Handling.

### **3.2 EXAMINATION**

- A. Verify that field conditions are acceptable and ready to receive work.

### **3.3 FIELD MEASUREMENTS**

- A. After becoming familiar with details of the work, verify all dimensions in the field, and advise the Contracting Officer of any discrepancy before performing the work.

### **3.4 INSTALLATION**

- A. Installation of magnetic flowmeters and signal converters/amplifiers/transmitters shall be in accordance with the manufacturer's written instructions.
- B. Wiring between flow sensors and remote mounted signal converters shall be supplied by the meter manufacturer.
- C. All magnetic flowmeters shall be grounded per manufacturer's requirements. The contractor shall coordinate grounding between signal converter, flow sensor, grounding rings, and ground rod to ensure compliance with the manufacturer's recommended grounding procedures. Prior to start up, the manufacturer shall provide written certification that the meter installation is in accordance with their requirements, including grounding.
- D. Unless specified or shown otherwise, signal converters/amplifiers/transmitters shall be remote mounted within NEMA 4X stainless steel enclosures. The enclosures shall be mounted to the wall adjacent to the respective meters.

### **3.5 CALIBRATION**

- A. Test Mode: Provide the ability to verify the accuracy of the unit and the integrity of the current loop without any external equipment.
- B. Meter calibration shall be in accordance with OIML R49 Type P, self-calibration requirements.
- C. Meter must be able to periodically generate simulated signals that verify that the output is within predefined limits.
- D. Coil inductance and resistance along with electrode voltage and impedance must be verifiable through diagnostic functionality.
- E. Warnings and Alarms: Shall be classified to NAMUR NE 107 standards. Meter must have the ability to display severity of warning with "maintenance, checkfunction, failure and out of spec" warning indications.
- F. Alarm priorities shall be classified as: "None; Maintenance; Out-of-spec; Function check; and Error."



- G. The quantity of occurrences, total time duration of the alarm occurrences, and time since last occurrence.
- H. All replacement transmitters shall be interchangeable without need for programming sensor calibration factors, meter size, site information, and serial numbers.
- I. Insitu Calibration Verification: This system shall be used to verify in a quantifiable manner the meter's current conditions vs. the meters condition when originally manufactured. This calibration verification of the meter shall be performed without need for physical access to the meter flow tube. Method must be able to print out hard copy of verification and diagnostic reports.
- J. Meters to be designed, manufactured, and calibrated in an ISO9001, UKAS/NAMAS, NIST, or NATA certified or traceable facility. Flow facility must be certified by volume or weight certified provers. Facility must have the capability to hold the flow rate at the specified calibration points for a minimum of five minutes to allow stabilization for flow and repeatability point checks.

### **3.6 FIELD TESTING**

- A. Test and calibrate in place the flow measuring equipment to demonstrate that it meets the accuracy requirements for the full range of flows specified herein. Provide all labor, equipment, and incidentals required for the tests, including electric power and water required for tests. The Contracting Officer shall witness all field tests and conduct all field inspections. The Contractor shall give the Contracting Officer ample notice of the dates and times scheduled for tests. Rectify any deficiencies found and retest the work affected by such deficiencies at the Contractor's expense. Record data from each field test shall be recorded and documented in a formal field test report.

### **3.7 MANUFACTURER'S REPRESENTATIVE SERVICES**

- A. As specified in the Manufacturer's written instructions.
- B. Provide the services of a manufacturer's representative who is experienced in the installation, adjustment, and operation of the equipment specified. The representative must supervise the installation, adjustment, and testing of the equipment.
- C. A field service technician or start-up engineer of the Flow Measuring System Supplier shall commission the Flow Measuring equipment.
- D. Local manufacturer's representatives are prohibited from performing these tasks unless authorized by the Flow Measuring System Supplier in writing.
- E. The field service technician shall certify that all equipment is properly installed and that the plant operators have been trained on proper operation and maintenance procedures.
- F. The minimum recommended man-days/trips for installation inspection, system commissioning, and operator training shall be two (2) days.
- G. The Owner reserves the right to videotape all training.

- H. Upon request of the Owner, at any time during the warranty period, the representative shall recheck the system, recalibrate and adjust equipment, answer plant operator's questions and review operation and maintenance procedures.

### **3.8 CLOSEOUT ACTIVITIES**

#### **A. Operation and Maintenance Manual**

1. The contractor shall submit a detailed Operation and Maintenance Manual for all equipment and components specified herein and incorporated into the Work. The Operation and Maintenance Manual shall be provided in accordance with the requirements of Section 01730 – Operation and Maintenance Data.
2. Operation and maintenance manuals shall include, but not be limited to, the following:
  - a. Equipment Performance Data and Drawings
    - 1) Detailed Bill of Materials for all equipment and components, listing: manufacturer's name, quantity, size, description, and catalog/part number.
    - 2) Manufacturer's product literature, specifications, performance capabilities, features and accessories, materials of construction, and illustrations.
    - 3) Dimensional drawings for each meter size.
    - 4) Electrical wiring schematics for flow sensor and signal converter/amplifier/transmitter. Interconnection wiring diagrams between signal converters/transmitters and related equipment and materials.
  - b. Equipment Installation Requirements
    - 1) Complete, detailed installation instructions for all equipment and components.
  - c. Equipment Operation Data
    - 1) Complete and detailed operating instructions, including operator interface menus, programming, and setup parameters.
    - 2) Printed list of all final setup parameters for each flowmeter, including factory settings and any field modifications to factory settings.
  - d. Equipment Service and Maintenance Data
    - 1) Maintenance data shall include all information and instructions required by the Department's personnel to keep equipment properly cleaned and adjusted so that it functions economically throughout its full design life.

- 2) Unloading, handling, and long-term storage requirements.
  - 3) Explanation with illustrations as necessary for each maintenance task.
  - 4) Recommended schedule of maintenance tasks.
  - 5) Troubleshooting instructions.
  - 6) List of maintenance tools and equipment.
  - 7) Recommended spare parts list.
  - 8) Name, address and phone number of manufacturer and manufacturer's local service representative.
- e. Manufacturer's Warranty.
  - f. Provide a signed written certification report with the Final Operation and Maintenance Manuals, certifying that the magnetic flowmeters have been properly installed, calibrated, and adjusted, and are suitable for satisfactory continuous operation under varying operating conditions, and meet all requirements specified in the Contract Documents.

**END OF SECTION**

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## SECTION 13423 - ANALYSIS INSTRUMENTATION

### PART 1 – GENERAL

#### A. SCOPE OF WORK:

1. Furnish all labor, materials, equipment, and appurtenances required to provide monitoring and control equipment at the locations indicated in the plans. New monitoring systems to be complete and operational with all control equipment and accessories as shown and specified.
2. Furnish, install, calibrate, test, adjust, and place into satisfactory operation all sensors and controllers as shown on the Drawings and specified herein.
3. The Drawings and Specifications illustrate and specify functional and general construction requirements of controllers and sensors, and do not necessarily show or specify all components, wiring, piping, and accessories required to make a completely integrated system. Provide all components, piping, wiring, accessories, and labor required for a complete and integrated system.
4. Coordinate with other suppliers for installation of all items specified herein and required to ensure the complete and proper interfacing of all the components and systems.
5. Controllers, modules, sensors, cables, and associated equipment are required for a complete monitoring system for measuring water quality parameters in water and wastewater treatment systems.

#### 1.2 REFERENCES

NEMA: National Electrical Manufacturers Association

ASTM: American Society for Testing and Materials

ANSI: American National Standards Institute

NEC: National Electric Code

#### 1.3 RELATED SECTIONS

15183 – Gauges

11151 – Sodium Hypochlorite Disinfection System

13300 – System Integration

#### 1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Terminals/Controllers, water quality measurement systems shall not be delivered to the site until all product information and system shop drawings for the system have been approved.
- B. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- C. Storage and Handling Requirements:
  - 1. Store and handle materials in accordance with manufacturer's instructions.
  - 2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
  - 3. Store materials in clean, dry area indoors.
  - 4. Protect materials during storage, handling, and installation to prevent damage.
  - 5. Temperature range for storage: 23°F to 149°F.

## 1.5 SUBMITTALS

- A. Shop drawings which shall include the following:
  - 1. Complete description in sufficient detail to permit an item comparison with the specification.
  - 2. A complete and detailed list of any and all variations to this specification.
  - 3. Manufacturer's complete system specification tailored to this specific project.
  - 4. Dimensions and installation requirements.
  - 5. Mounting bracket / sensor holder installation instructions.
  - 6. Descriptive information including catalog cuts and manufacturers specifications for components.
  - 7. Wiring and control schematics and layouts.
  - 8. Documentation of experience with water analysis equipment design and installation.
  - 9. Manufacturer's Certifications: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
  - 10. Operation and Maintenance Manual information.
  - 11. Manufacturer's recommended accessories and spare parts.
  - 12. Warranty Information.

## 1.6 WARRANTY

- A. The equipment furnished under this section shall be free of defects in material and workmanship, including damages that may be incurred during shipping for a period of 12 months from date of substantial completion.

## 1.7 QUALITY ASSURANCE

- A. Furnish universal controllers and sensors by the named manufacturers.
- B. The named manufacturers have been specified to establish the standard of quality and performance of the equipment to be supplied.
- C. The following product certifications are required:
  - 1. EMC: CE compliant for conducted and radiated emissions CISPR 11 (Class A limits), EMC Immunity EN 61326-1 (Industrial limits).
  - 2. Safety: General Purpose UL/CSA 61010-1 with cETLus safety mark.
  - 3. Australian C-TICK and Korean KC Markings
  - 4. NEMA 4X/IP65 Water and Dust Ingress Ratings

## **PART 2 – PRODUCTS**

### 2.1 GENERAL REQUIREMENTS

- A. Provide a chlorine residual and ammonia analyzer monitoring and control system complete with sensors, reagents, controllers, communications, hardware, etc. as indicated on the Drawings and as herein specified.
- B. Sensors and Controller shall be supplied by the same manufacturer.
- C. Monitoring systems shall be designed for complete outdoor installation of sensors and indoor installation of controls, with shelter and/or supplemental cooling or heating, if required by the system's manufacturer.
- D. With the exception of conduit adapters, all wiring and cabling shall be installed in rigid conduit (RNC, Type EPC-80-PVC).

## 2.2 CHLORINE RESIDUAL ANALYZERS

### A. Operational Criteria

1. Operating temperature: 5 to 45 °C (41 to 113 °F)
2. Relative humidity: 0-95%, non-condensing

### B. Sample Requirements

1. Maximum back pressure the chlorine sensor can manage without failure:
  - a. 0.5 bar, no pressure impulses and/or vibrations
2. Temperature: 0 to 45 °C (33 to 113 °F)
3. Temperature compensation range: 5 to 45 °C (41 to 113 °F)
4. Flow: 30-50 L/hr, 40 L/hr - optimal (7.9-13.2 g/hr, 10.6 g/hr - optimal)

### C. Storage Requirements

1. Electrolyte: 15 to 25°C (59 to 77°F)
2. Chlorine sensors: 0 to 50°C (32 to 122°F) dry without electrolyte
3. Panel: -20 to 60°C (-4 to 149°F)

### D. Performance Requirements

1. Measurement range: 0 to 20 ppm chlorine for either free or total chlorine
2. Total Chlorine
  - a. Low Limit Of Detection (LOD): 30 ppb (0.03 ppm) or better
  - b. Limit Of Quantitation (LOQ): 90 ppb (0.09 ppm) or better
  - c. Repeatability/precision: 30 ppb or 3%, whichever is greater
  - d. Response time: ~100 s for 90% change ( $T_{90}$ ) (At a stable T and pH)
  - e. Interference: Chlorine Dioxide, Ozone, and chalk deposits
3. Free Chlorine
  - a. Low Limit Of Detection (LOD): 30 ppb (0.03 ppm) or better
  - b. Limit Of Quantitation (LOQ): 90 ppb (0.09 ppm) or better
  - c. Repeatability/precision: 30 ppb or 3%, whichever is greater
  - d. Response time: ~140 s for 90% change ( $T_{90}$ ) (At a stable T and pH)
  - e. Interference: Monochloramine, Chlorine Dioxide, Ozone, and chalk deposits



4. Drift: <10% with regular calibration (calibration will be weekly to quarterly depending on the application, given stable sample temperature and pH of water sample)
5. Specificity/Selectivity: Non-specific to a certain chlorine form, responds to any chlorine species and other oxidizers as noted in the interference section.
6. Calibration method: Customer has the option to use one (zero or slope) or two-point (zero and slope) calibration. Two-point calibration with chemical zero is recommended for chlorine concentration <0.5 ppm.
7. Verification procedure: One-point process calibration (slope) against a standard reference method.

#### E. Manufacturers

1. Hach Company, Loveland, CO
  - a. Model CLF10sc Reagentless Free Chlorine Analyzer
  - b. Model CLT10sc Reagentless Total Chlorine Analyzer

#### F. Analyzer shall consist of:

1. Three-Electrode Amperometric Chlorine sensor
2. Chlorine sensor flow cell with integrated flow sensor
3. pH flow cell with grab sample port
4. Digital gateway for communication between probes and controller
5. Stainless steel panel

### 2.3 AMMONIA MONOCHLORAMINE ANALYZERS

#### A. Operational Criteria

1. Operating temperature: 5 to 45 °C (41 to 113 °F)
2. Relative humidity: 5-95%, non-condensing

#### B. Sample Requirements

1. Sample pressure:
  - a. 2.5 – 87 psi
2. Temperature: 5 to 50 °C (41 to 122 °F)
3. Flow: 100-1000 mL/minute

#### C. Storage Requirements

1. Panel: -20 to 60°C (-4 to 149°F)

#### D. Performance Requirements

1. Measurement range: 0.1 to 10.0 mg/l
2. Total Ammonia
  - a. Low Limit Of Detection (LOD): 0.01 ppm (as N)
  - b. Limit Of Quantitation (LOQ): 2 ppm( as N)
  - c. Repeatability/precision: 3% or 0.01 ppm (as N), whichever is greater
  - d. Response time: Within 5 minutes

#### E. Manufacturers

1. Hach Company, Loveland, CO
  - a. Model 5500 sc Ammonia Monochloramine Analyzer

## 2.4 EQUIPMENT

A The CLF10 and CLT10 will work with Hach sc model controllers only. The amperometric cell of the sensor consists of:

2. Gold cathode
3. Stainless steel counter electrode
4. Silver/silver chloride reference electrode
5. pH buffered electrolyte
6. Sensor membrane to filter chlorine species selectively and to provide interface between the electrochemical cell and the sample

A. Wetted materials as follows:

1. Chlorine Measuring Cell: PVC
2. Chlorine Sensor Body: PVC
3. Chlorine Sensor Flow Cell: Acrylic
4. Optional pH Sensor Flow Cell: PVC

B. The sensor interface to the controller is through a digital gateway.

C. The chlorine sensor automatically compensates for temperature utilizing an embedded temperature sensor.

D. The electrolyte provides internal, buffered pH compensation in the range of 4-9 pH units.

- E. The sensor includes proprietary Cal Watch self-diagnostic technology.
- F. The panel assembly includes a flow cell that integrates a flow meter and control valve.

## 2.5 COMPONENTS

### A. Standard equipment:

1. Stainless Steel Mounting Panel
2. Chlorine Sensor with Membrane and Electrolyte
3. Chlorine Sensor flow cell
4. Flow meter with control valve
5. Digital gateway to sc controller with cable
6. User Manual

### B. Dimensions

1. Sensor
  - a. Length: 7.68 in. (195 mm)
  - b. Diameter: 0.98 in. (25 mm)
2. Panel
  - a. Length: 19.0 in. (482.6 mm)
  - b. Width: 19.5 in. (495.3 mm)
  - c. Depth: 5.95 in. (151.2 mm)
3. Gateway to Controller cable: 3 ft. (1 m)

### C. Weight

1. Panel and empty panel-mounted components: approximately 12 lbs. (5.5 kg)
2. Complete panel with pH sensor: approximately 20 lbs. (9.1 kg)

## 2.6 ACCESSORIES

### A. Required

1. Hach Controller – sc4500 Digital Controller
  - a. Controller is microprocessor-based and is housed in an IP65 enclosure
  - b. Controller is a modular system consisting of:
    - 1) Display Module
    - 2) Probe Module
    - 3) Controller has two connections for Hach digital Sensors

2. pH sensor
- B. Optional
  1. Acidification unit
  2. Sample conditioning kit

## **PART 3 – EXECUTION**

### 3.1 Preparation

- A. Clearances
  3. The pre-assembled analyzer panel must be mounted to allow clearance for sensor removal and routine maintenance.
- C. Mounting
  1. Wall or panel mounted
- D. Sample Inlet (order with English or Metric Fittings)
  1. English Fittings
    - a. Speed-fit fitting – ¼ in OD Tube
  2. Metric Fittings
    - a. Speed-fit fitting – 6 mm OD Tube
- E. Sample Outlet (order with English or Metric Fittings)
  1. English Fittings
    - a. Speed-fit fitting – ½ in OD
  2. Metric Fittings
    - a. Speed-fit fitting – 12 mm OD

### 3.2 Installation

- A. Contractor will install the analyzer in strict accordance with the manufacturer's instructions and recommendation.
- B. Manufacturer's representative will include a half-day of start-up service by a factory-trained technician, if requested.
  1. Contractor will schedule a date and time for start-up.
  2. Contractor will require the following people to be present during the start-up procedure.
    - a. General contractor
    - b. Electrical contractor
    - c. Hach Company factory trained representative
    - d. Owner's personnel
    - e. Engineer

### 3.3 Manufacturer's Service and Start-Up

- A. Contractor will include the manufacturer's services to perform start-up on instrument to include basic operational training and certification of performance of the instrument.
- B. Contractor will include a manufacturer's Service Agreement that covers all the manufacturer's recommended preventative maintenance, regularly scheduled calibration and any necessary repairs beginning from the time of equipment startup through to end user acceptance / plant turnover and the first 12 months of end-user operation post turnover.
- C. Items A and B are to be performed by manufacturer's factory-trained service personnel. Field service and factory repair by personnel not employed by the manufacturer is not allowed.
- D. Use of manufacturer's service parts and reagents is required. Third-party parts and reagents are not approved for use.
- E. The Contractor shall provide the following minimum manufacturer's representative service requirements:
  - 1. 4 hours on site for start-up and testing.
  - 2. 4 hours on site for operator training.

**END OF SECTION**

## SECTION 15009 - PIPE SUPPORTS

### PART 1 - GENERAL

#### 1.01 SCOPE OF WORK

- A. The Contractor shall furnish labor, materials, equipment and incidentals and install pipe hangers, supports, beam clamps, hanger rods, friction clamps, concrete inserts, and anchor bolts including all hanging and supporting devices for supporting non-buried piping as shown on the Drawings and as specified herein. The Contractor shall note not all pipe supports, hangers, anchorages, or expansion joints may be shown on the drawings. The Contractor shall provide final responsibility for proper permanent support and anchorage of all piping systems.
- B. Unless otherwise noted, whenever the word “support” is used herein, it shall mean any overhead hangers, wall bracket, supports from the floor, friction clamps and attendant beam clamps, concrete inserts, pipe guides, rods, supports pipes and other necessary equipment for supporting and/or anchoring any pipes, tubing, or appurtenances. Where the word “pipe” is used it shall mean pipe, appurtenances and/or tubing.

#### 1.02 RELATED WORK

- A. Concrete is included in Division 3.
- B. Miscellaneous metal fabrication is included in Section 05500.
- C. Field painting is included in Section 09970.
- D. Piping and valves are included in Division 15.

#### 1.03 SUBMITTALS

- A. The Contractor shall submit to the Engineer as provided in Section 01300, complete sets of shop drawings of all items to be furnished under this Section. Submittals shall include complete layouts, schedules, location plans and complete total bill of materials for all pipe support systems.
- B. Submittals shall include a representative catalog cut for each different type of pipe hanger or support indicating the materials of construction, important dimensions and range of pipe sizes for which that hanger is suitable. Where standard hangers and/or supports are not suitable, submit detailed drawings showing materials and details of construction for each type of special hanger and/or support.

- C. Submittals shall include complete piping drawings indicating type of hanger and/or support, location, magnitude of load transmitted to the structure and type of anchor, guide and other pipe supporting appurtenances. Submittals shall use detail numbers as shown on the Drawings to indicate type of support proposed wherever possible.
- D. Type and locations of pipe hangers and/or supports shall also be shown on the piping layouts for each piping submittal as specified in the respective Division 13 and 15 pipe specifications.
- E. Submit complete design data for support systems to show conformance with this Specification.

#### 1.04 QUALIFICATIONS

- A. Hangers, supports and appurtenances shall conform to the latest applicable requirements of ASME B31.1, except as supplemented or modified by the requirements herein.
- B. Hangers, supports and appurtenances shall be of approved standard design where possible and shall be adequate to maintain the supported load in proper position under all operating conditions. The minimum working factor of safety for supporting equipment, with the exception of springs, shall be five times the ultimate tensile strength of the material, assuming 10 feet of water filled pipe being supported.
- C. Pipe and appurtenances connected to equipment shall be supported in such a manner as to prevent any strain being imposed on the equipment. When manufacturers have indicated requirements that piping loads shall not be transmitted to their equipment, submit certification stating that such requirements have been complied with.
- D. The supports specified under this section shall be furnished by a manufacturer who is fully experienced, reputable, qualified and is regularly engaged in the design of complete pipe support systems and the manufacture (or fabrication) of the items to be furnished.
- E. The piping supports and anchorages (including location of guides and expansion joints) shall be designed and supplied, as an integral system, by a single manufacturer. The pipe support manufacturer shall certify through the Contractor to the Engineer that the supports and/or anchorage have been designed as a system.
- F. Design calculations for pipe supports and anchorage systems (including guides and expansion joints) shall be submitted, along with the pipe system drawings. Calculations shall be stamped by a licensed Professional Engineer who is regularly engaged in pipe support system design.

## 1.05 DESCRIPTION OF SYSTEM

- A. All pipe and tubing shall be supported and anchored as required to prevent significant stresses in the pipe or tubing material, valves, fittings and other pipe appurtenances and to support and secure the pipe in the intended position and alignment. All supports and anchorage shall be designed to adequately secure the pipe against excessive dislocation due to thermal expansion and contraction, internal flow forces, and all probable external forces such as equipment, pipe, and personnel contact.
- B. All pipe and appurtenances connected to equipment shall be supported in such a manner as to prevent any strain being imposed on the equipment. When manufacturers have indicated requirements that piping loads shall not be transmitted to their equipment, submit certification stating that such requirements have been complied with.
- C. All pipe supports shall be designed with liberal strength and stiffness to support the respective pipes under the maximum combination of peak loading conditions to include pipe weight, liquid weight, liquid movement, and pressure forces, thermal expansion and contraction, vibrations, and all probable externally applied forces. Prior to installation, all pipe supports shall be approved by the Engineer.
- D. The minimum working factor of safety for all supporting equipment, with the exception of springs and anchorage, shall be five (5) times the ultimate tensile strength of the material, assuming a supported weight of a length of water filled pipe and equal to half the distance to the next supports. Valves and other concentrated loads shall be accounted for.
- E. The minimum factor of safety for thrust anchorage design shall be 1.5. Thrust design shall utilize: working pressure plus water hammer; or 1.5 times working pressure; or test pressure whichever is highest or as noted on the Drawings and as acceptable to the Engineer.
- F. All supports of the same type shall be identical, varying only with size, and the product of a single manufacturer or fabricator. Supports shall be provided where indicated on the Drawings, where required, and where acceptable to the Engineer to form a complete workable system. If types of pipe supports other than those shown on the Drawings or specified are required, they shall be as acceptable to the Engineer.

## 1.06 REFERENCE STANDARDS

- A. Manufacturer's Standardization Society (MSS):
  - 1. MSS SP-58 - Pipe Hangers and Supports - Materials and Design.
  - 2. MSS SP-69 - Pipe Hangers and Supports - Selection and Application.



B. American Society for Testing and Materials (ASTM):

1. ASTM A36 - Standard Specification for Carbon Structural Steel.
2. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60000 PSI Tensile Strength.

C. American Society of Mechanical Engineers (ASME):

1. ASME B31.1 - Power Piping Code.

## **PART 2: PRODUCTS**

### 2.01 GENERAL

- A. The equipment specified herein is intended to support the various types of pipe and piping systems. The details shown on the Drawings are intended to indicate the generally desired methods of support under normal conditions. It shall be the responsibility of the Contractor to develop final details and any details associated with special conditions not already covered to meet the system conditions specified in the respective Division 15 pipe specifications.
- B. Pipe and tubing shall be supported as required to prevent significant stresses in the pipe or tubing material, valves, fittings and other pipe appurtenances and to support and secure the pipe in the intended position and alignment. Supports shall be designed to adequately secure the pipe against excessive dislocation due to thermal expansion and contraction, internal flow forces, and all probable external forces such as equipment, pipe, and personnel contact. Any structural steel members required to brace any piping from excessive dislocation shall conform to the applicable requirements of Section 05500 and shall be furnished and installed under this Section.
- C. Hangers and supports shall be spaced in accordance with ASME B31.1, except that the maximum unsupported spans shall not exceed 10 feet unless otherwise specified herein.
- D. Where flexible couplings are required at equipment, tanks, etc., the end opposite to the piece of equipment, tank, etc., shall be rigidly supported. All sleeve couplings and expansion joints shall be supported on both sides.
- E. Pipe and appurtenances connected to the equipment shall be supported in a manner to prevent any strain from being imposed on the equipment or piping system.
- F. Rods, clamps, hangers, inserts, anchor bolts, brackets, and components for interior pipe supports shall be furnished with galvanized finish, hot dipped or elector-galvanized coated, except where field welding is required. Interior clamps on plastic pipe shall be plastic coated. Supports for copper pipe shall be copper plated or shall

- have a 1/16-in. plastic coating. Rods, clamps, hangers, inserts, anchor bolts, brackets, and components for exterior pipe, submerged piping, pipe subject to splashing and pipe within outdoor structures shall be of Type 316 stainless steel.
- G. Supports shall be sufficiently close together such that the sag of the pipe is within limits that will permit drainage and avoid excessive bending stresses from concentrated loads between supports. There shall be no visible sagging.
  - H. Uninsulated non-metallic piping such as PVC, CPVC, etc., shall be protected from local stress concentrations at each support point. Protection shall be provided by galvanized steel protection shields or other method as approved by the Engineer. Where pipes are bottom supported 180 degrees, arc shields shall be furnished. Where 360 degree arc support is required, such as U bolts, protection shields shall be provided for the entire pipe circumference. Protection shields shall have an 18 gauge minimum thickness, not be less than 12 inches in length, and be securely fastened to pipe with stainless steel or galvanized metal straps not less than 3 inches wide.
  - I. Insulated pipe shall be furnished with a rigid foam insulating saddle at each pipe support location as specified under respective pipe insulation. Provide galvanized protection shields as specified in Paragraph 2.01H above at each location.
  - J. Where pipe hangers and supports come in contact with copper piping, provide protection from galvanic corrosion by wrapping pipe with 1/16-in. thick neoprene sheet material and galvanized protection shield isolators, or by using copper plated or PVC coated hangers and supports.
  - K. Pipe supports shall be provided as follows:
    - 1. Cast iron and ductile iron piping shall be supported at a maximum support spacing of 10 feet with a minimum of one support per pipe section at the joints.
    - 2. Support spacing for steel and stainless steel piping two inch and smaller diameter and copper tubing shall not exceed five feet.
    - 3. Vertical pipes shall be supported at each floor or at intervals of not more than twelve feet by approved pipe collars, clamps, brackets, or wall rests, and at points necessary to insure rigid construction.
    - 4. Pipe supports shall not induce point loadings but shall distribute pipe loads evenly along the pipe circumference.
    - 5. Supports shall be provided at changes in direction or specified herein. No piping shall be supported from other piping or from metal stairs, ladders, and walkways, unless specifically directed or authorized by the Engineer.

6. Pipe supports shall be provided to minimize lateral forces through valves, both sides of split type couplings, and sleeve type couplings and to minimize all pipe forces on pump housings. Pump housings shall not be utilized to support connecting pipes.
  7. Effects of thermal expansion and contraction of the pipe shall be accounted for in the pipe support selection and installation.
- L. Unless otherwise specified herein, pipe hangers and supports shall be as manufactured by Carpenter and Paterson, Inc., Woburn, MA; Anvil International, Portsmouth, NH; and Unistrut, Harvey, IL; or equal. Any reference to a specific figure number of a specific manufacturer is for the purpose of establishing a type and quality of product and shall not be considered as proprietary.
  - M. Any required pipe supports for which the supports specified in this Section are not applicable shall be fabricated or constructed from standard structural steel shapes, concrete and anchor hardware similar to items previously specified herein and shall be subject to the approval of the Engineer.
  - N. Wedge anchor bolts shall be equal to Kwik-Bolt as manufactured by the Hilti Corporation, or equal. The length of expansion bolts shall be sufficient to place the wedge portion of the bolt a minimum of 1 inch behind the steel reinforcement, but in no case less than 3 inches. Expansion type anchors shall not be used in locations where the normal loading will be direct tension.
  - P. Cast-in-place anchor bolts for interior supports shall meet the requirements of ASTM A307. All anchor bolts, nuts and washers shall be hot dip galvanized or cadmium plated; except where pipe supports will be submerged or within one foot above liquid levels, in which case all bolts, nuts, washers and hardware shall be Type 316 stainless steel.

## 2.02 SINGLE PIPE HANGERS

- A. Single pipes shall be supported by hangers suspended by steel rods from structural steel members, concrete ceilings and beams, bottom of trapeze hangers and wall mounted steel angle brackets.
- B. Hanger rods shall be hot rolled steel, machine threaded. The strength of the rod shall be based on its root diameter.
- C. Except as otherwise specified herein, pipe hangers shall be adjustable clevis type similar to Carpenter and Paterson Figure 100, material as required.
- D. Hanger rods shall be attached to concrete structures using concrete inserts similar to Carpenter and Paterson Figure 650. Beam clamps, C clamps, or welded beam attachments shall be used for attaching hanger rods to structural steel members.

Where necessary and approved by the Engineer, double expansion shields shall be used for attaching to concrete structures.

- E. Where pipes are near walls, beams, columns etc. and located an excessive distance from ceilings or underside of beams, welded steel wall brackets similar to Carpenter and Paterson Figures 69, 84, or 139, shall be used for hanging pipe. Where single pipes rest on top of bracket pipe supports, attachments shall meet requirements as specified under multiple pipe hangers.

### 2.03 MULTIPLE PIPE HANGERS

- A. Suspended multiple pipes, running parallel in the same horizontal plane, which are adjacent to each other shall be suspended by trapeze type hangers or wall brackets. Trapeze hangers shall consist of structural steel channel supported from threaded rod or attached to concrete walls, columns or structural steel support members as required to meet the intent of this specification. Channel shall be similar to Carpenter and Paterson Figure 371. Rods, concrete inserts, "C" Clamps, beam clamps, welded beam attachments, and expansion shields shall be as specified in Paragraph 2.02 Single Pipe Hangers above.
- B. Except as otherwise specified herein, pipe anchors used for attaching pipe to trapeze or multiple pipe wall brackets shall be anchors or pipe chairs as required. Chair "U" bolts shall be tightened to allow freedom of movement for normal expansion and contraction, except where pipe must be anchored to control direction of movement or to act as a thrust anchor.

### 2.04 SINGLE AND MULTIPLE PIPE SUPPORTS

- A. Single pipes located in a horizontal plane close to the floor shall be supported by one of the methods specified herein or as shown on the Drawings.
- B. Pipes 3 inches in diameter and larger shall be supported by adjustable stanchions similar to Carpenter and Paterson Figures 101 and 138. Stanchions shall provide at least a 4 inch adjustment and be flange mounted to the floor.
- C. Pipes less than 3 inches in diameter shall be held in position by fabricated "C" channel, welded post base similar to Unistrut Series P2072A and pipe clamps similar to Unistrut Series P1109 thru P1126. Where required to assure adequate support, fabricate supports using two vertical members and post bases connected together by horizontal member of sufficient load capacity to support pipe. Wherever possible, supports shall be fastened to nearby walls or other structural members to provide horizontal rigidity. More than one pipe may be supported from a common fabricated support.

- D. Where shown on the Drawings, pipe shall be supported using concrete anchor posts. The pipe shall be securely fastened to concrete anchor posts using suitable metal straps as required and approved by the Engineer.

## 2.05 WALL SUPPORTED PIPES

- A. Single or multiple pipes located adjacent to walls, columns or other structural members, whenever deemed necessary, shall be supported using welded steel wall brackets similar to Carpenter and Paterson Figures 69, 84, or 139; or "C" Channel with steel brackets similar to Unistrut pipe clamps. All members shall be securely fastened to wall, column, etc. using double expansion shields or other method as approved by the Engineer. Additional wall bearing plates shall be provided where required.
- B. Pipe shall be attached to supports using methods hereinbefore specified to meet the intent of this Specification.

## 2.06 BASE ANCHOR SUPPORT

- A. Where pipes change direction from horizontal to vertical via a bend, a weld or cast base anchor support shall be installed at the bend to carry the load. The bend anchor shall be fastened to the floor and double expansion shields or other method as approved by the Engineer.
- B. Where pipe are to bends shall be supported using concrete anchor posts, pipes shall be securely fastened to concrete supports with suitable metal bands as required and approved by the Engineer.

## 2.07 VERTICAL PIPE SUPPORTS

- A. Where vertical pipes are not supported by a Unistrut system as specified in Paragraph 2.08, they shall be supported in one of the following methods.
  - 1. For pipes  $\frac{1}{4}$  inch to 2 inches in diameter, an extension hanger ring may be used with an extension rod and hanger flange. The rod diameter shall be as recommended by the manufacturer for the type of pipe to be supported. The hanger ring shall be galvanized steel, stainless steel, or PVC clad depending on the supported pipe. The hanger ring shall be similar to Carpenter and Paterson Figure 81. The anchor flange shall be similar to Carpenter and Paterson Figure 85.
  - 2. For pipes equal to or greater than  $\frac{1}{2}$  inches in diameter, extended pipe clamps similar to Carpenter and Patterson Figure 267 may be used. The hanger shall be attached to concrete structures using double expansion shields or to steel support members using welding lugs similar to Carpenter and Paterson Figure 220.

3. Pipe riser clamps shall be used to support vertical pipes extending through floor slabs. Riser clamps shall be similar to Carpenter and Patterson Figure 126. Copper clad or PVC coating clamps shall be used on copper pipes. Insulation shall be removed from insulated pipes prior to installing riser clamp.
4. Unless otherwise specified, shown, or specifically approved by the Engineer, vertical runs exceeding twelve feet shall be supported by approved pipe collars, clamps, brackets or wall rests at all points required to insure a rigid installation.

## 2.08 SPECIAL SUPPORTS

- A. Pipe supports shall be provided for closely spaced vertical piping systems as required to provide a rigid installation. The support system shall consist of a framework suitably anchored to floors, ceilings and walls and be as manufactured by Unistrut, or equal.
- B. Vertical and horizontal supporting members shall be U shaped channels similar to Unistrut Series P1000 or P5500. Vertical piping shall be secured to the horizontal members by pipe clamps or pipe straps equal to Unistrut Series P2558.
- C. The assemblies shall be furnished complete with nuts, bolts, and fittings required for a complete assembly including end caps for all members.
- D. The design of each individual framing system shall be the responsibility of the Contractor. Shop drawings, as specified above shall be submitted and shall show all details of the installation, including dimensions and types of supports. In all instances the completed frame shall be adequately braced to provide a complete rigid structure when all the piping has been attached.
- E. Any required pipe supports for which the supports specified in this Section are not applicable shall be fabricated or constructed from standard structural steel shapes in accordance with applicable provisions of Section 05500, shall have anchor hardware similar to items specified herein, shall meet the minimum requirements listed below, and shall be subject to the approval of the Engineer.
  1. Pipe support systems shall meet all requirements of this Section and all related Sections of this Specification.
  2. Complete design details of the entire pipe support system shall be provided for review by the Engineer in the submittals specified in subsection 1.03.
  3. The pipe support system shall not impose loads on the supporting structures in excess of the loads for which the supporting structure is designed.

## 2.09 SURFACE PREPARATION AND SHOP PRIME PAINTING

- A. Non-galvanized ferrous surfaces shall be prepared and shop painted as part of the work of this Section. Surface preparation and shop painting shall be specified in Section 09970.

## **PART 3 - EXECUTION**

### 3.01 COATING

- A. After fabrication and before installation, all ferrous metal surfaces of pipe supports, hangers, anchors, rods, support pipes, brackets, nuts, bolts, washers and other metal used, shall be either galvanized (except cast or ductile iron), or shall receive the coating as specified in Section 09970.

### 3.02 SHIPPING, HANDLING, DELIVERY AND STORAGE

- A. All supports and hangers shall be crated, delivered and uncrated so as to protect against any damage.
- B. All parts shall be properly protected so that no damage or deterioration shall occur during a prolonged delay from the time of shipment until installation is completed.

### 3.03 PREPARATION

- A. Locate hangers, supports and accessories to support piping, valves and at all concentrated loads.
- B. Locate hangers, supports and accessories within maximum span lengths specified to support continuous pipeline runs.
- C. Locate hangers and supports to prevent vibration or swaying and to provide for expansion and contraction.
- D. Install items to be embedded before concrete placement.
- E. Fasten embedded items securely to prevent movement during concrete placement.
- F. Install hanger and support units on piping systems as recommended by manufacturer.
- G. Adjust hangers and supports and place grout for concrete supports to bring pipelines to specified elevations.
- H. Ferrous pipe shall be supported by galvanized steel or stainless steel pipe attachments.

- I. Copper pipe shall be supported by plastic-coated or copper-plated steel pipe attachments.
- J. Plastic pipe shall be supported by plastic-coated steel pipe attachments, or with suitable rubber shields.
- K. Stainless steel pipe shall be supported by plastic-coated steel pipe attachments.

### 3.04 INSTALLATION

#### A. Supports and Hangers for Horizontal Pipes.

- 1. Space supports and hangers for all piping no farther apart than indicated below unless otherwise shown.
  - a. Copper Tube:
    - (1) 2 inches in diameter and smaller: 5 feet
    - (2) Greater than 2 inches in diameter: 8 feet
  - b. Steel Pipe:
    - (1) 1 inch in diameter and smaller: 6 feet
    - (2) Greater than 1 inch in diameter: 10 feet
  - c. Stainless Steel Pipe:
    - (1) 2 inches in diameter and smaller: 5 feet
    - (2) Greater than 2 inches in diameter: 8 feet
  - d. Plastic Pipe:
    - (1) Maximum support spacing for plastic pipe at ambient temperature shall be one-half the above values specified for steel pipe.
  - e. Ductile Iron Pipe:
    - (1) Two supports per length.
- 2. Additional supports shall be placed immediately adjacent to any change in piping direction, and on both sides of valves and couplings.
- 3. Accurately locate inserts for hanger rods in forms before concrete is placed.



4. Use expansion anchors only to support rods, hangers and brackets for piping 2-in. and smaller and only if the expansion anchors are designed to carry 100 percent of the full load, hangers and/or bracket and pipe load.

B. Supports for Vertical Piping.

1. Provide riser clamp placed under hub, fitting or coupling with approved solid bearing on steel sleeve at each floor level.
2. Where riser clamps are used with plastic piping they shall be modified so as not to exert any compressive forces on the pipe.

3.05 ACCEPTANCE AND SERVICE

- A. Pipe systems shall be brought to operating pressures and temperatures. Systems shall be cycled to duplicate operating conditions. If any part of the piping support system proves to be defective or inadequate, it shall be repaired or augmented under this section to the satisfaction of the Engineer and at no additional cost to the Owner. Contractor shall furnish labor and materials to readjust and correct faults with hangers and supports for the piping systems.

**END OF SECTION**

## SECTION 15042 - DUCTILE IRON PIPE

### PART 1 - GENERAL

#### 1.01 SCOPE OF WORK

The Contractor shall furnish all labor, materials, equipment, and incidentals required and install ductile iron pipe, and ductile iron fittings for buried piping and above grade piping as shown on the drawings and as specified herein.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

Section 09800 - Protective Coatings  
Section 15000 - Pipe Supports

#### 1.03 QUALITY ASSURANCE

- A. The Contractor shall obtain ductile iron pipe and fittings from no more than one manufacturer.
- B. Reference Standards: The material furnished and installed under this Section shall comply with the latest editions of the following:
  - 1. AWWA C104, Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
  - 2. AWWA C110, Gray-Iron and Ductile-Iron Fittings, 3 in. through 48 in., for Water and Other Liquids.
  - 3. AWWA C111, Rubber Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
  - 4. AWWA C115, Flanged Ductile- Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
  - 5. AWWA C116, Protective Fusion-Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings.
  - 6. AWWA C151, Ductile-Iron Pipe, Centrifugally Cast.

#### 1.04 SUBMITTALS

- A. The Contractor shall submit complete information on pipe and fittings including definitive demonstration of compliance with all applicable standards.
- B. The Contractor shall submit, and shall comply with, the recommendations of the pipe manufacturer for handling, storing, and installing pipe and fittings.
- C. The Contractor shall submit the pipe manufacturer's certification of compliance with the specifications.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Ductile iron pipe shall conform to AWWA C151. Thickness of flanged pipe shall be Special Class 53 for 54" diameter and smaller. Fittings shall meet the requirements of AWWA C110.
- B. Flanged joints shall be provided for exposed locations. Pipe barrels shall conform to AWWA C151. Flanges shall be ductile iron in accordance with AWWA C115. The bolt holes shall be aligned per AWWA C115. Flanges shall be factory installed. Flanges shall conform to the drilling and facing of ANSI B16.1 Class 125 flanges.
- C. Fittings shall be ductile iron as specified herein. Flanges and flanged fittings shall be flat face and shall conform to ANSI A21.10 for 150 psi pressure rating. Fittings shall be full size.
- D. Full face gaskets designed specifically for the unique surface of ductile iron shall be used. Flat rubber gaskets shall not be used. All nuts and bolts shall be 316 stainless steel with anti-seize compound.
- E. Interior Lining
  - 1. Interior surfaces of pipe shall be cleaned and lined in the factory with a NSF 61 certified cement mortar lining in conformance with AWWA C104. Lining shall be double thickness for pipe to be used in waterlines. Pipe to be used in wastewater lines shall have a ceramic epoxy lining as follows:
    - a. Material: Amine cured novalac epoxy containing a minimum of 20 percent by volume ceramic quartz pigment meeting all the performance characteristics of Protecto 401 or equal coating system. Certification of test results for coating system shall be submitted.
    - b. Surface Preparation: The surface shall be prepared in strict accordance with the coating system manufacturer's procedures.
    - c. Application: Coating system shall be factory applied by the ductile iron pipe manufacturer.
    - d. Lining Thickness: Pipe shall receive 40 mils, minimum dry film thickness of coating.
    - e. Inspection: Pipe lining shall be checked in the factory for thickness using a magnetic film thickness gauge using the method outlined SSPCPA-2 Film Thickness Rating. Interior lining of pipe and fittings shall be tested for pinholes with a non-destructive 2,500-volt test. Any defects found shall be repaired prior to shipment.
  - 2. Interior surfaces of fittings shall be lined in the factory with a NSF 61 certified

fusion bonded epoxy lining in conformance with AWWA C116.

F. Exterior Coating

1. Exposed. The exterior surfaces of pipe and fittings which will not be buried shall be coated in conformance with the requirements of Section 9970 - Protective Coating.
2. Buried. The exterior surfaces of pipe and fittings for buried service shall receive factory applied asphaltic coating, 1 mil minimum thickness.

G. Restrained joints shall be Series 1100 MEGALUG mechanical joint thrust restraint as manufactured by EBAA Iron, Inc. or approved equal. Joints shall be furnished with 316 stainless steel T-bolts. All gland bodies, wedges, and wedge activators and bolts shall be fusion bonded epoxy coated. Restrained joints are required at all fittings and at distances indicated on the plans.

2.02 IDENTIFICATION

Each length of pipe and each fitting shall be marked with the name of manufacturer, size and class. All gaskets shall be marked with the name of manufacturer, size, and proper insertion direction.

**PART 3 - EXECUTION**

3.01 INSTALLATION

- A. All piping shall be installed in accordance with recommendations of the pipe manufacturer and as specified herein.
- B. Care shall be taken in handling, storage, and installation of pipe and fittings to prevent injury to the pipe, lining or coating. Every precaution shall be taken to prevent damage to the lining. Pipe shall only be handled from the exterior. No interior handling forks, rods, ropes, straps or other handling means shall be used within the pipe. All pipe and fittings shall be examined before installation, and no piece shall be installed which is found to be defective. Any damage to the pipe coating shall be repaired according to the manufacturer's recommendations.
- C. Flanged faces shall bear uniformly on the gasket, and the bolts shall be tightened in a progressively crisscrossed pattern, such as by tightening the bottom bolt first; then, the top bolt; next, the bolts at either side; and finally, the remaining bolts. This process shall be repeated until all bolts are adequately tightened.
- D. The Contractor shall prevent bending or torsional strains from being applied to

flanges or flanged appurtenances.

**END OF SECTION**

## SECTION 15064 - PLASTIC PRESSURE PIPE

### PART 1 – GENERAL

#### 1.01 DESCRIPTION

A. Scope:

1. The Contractor shall furnish all labor, materials, equipment, and incidentals for plastic pressure pipe systems as shown on the Drawings.

#### 1.02 RELATED SECTIONS

Section 02300 - Excavation and Backfill  
Section 02580 - Pipeline Installation and Testing  
Section 15042 - Ductile Iron Pipe

#### 1.03 QUALITY ASSURANCE

A. Source Quality Control:

The Contractor shall obtain pipe from no more than one manufacturer.

B. Reference Standards: The Contractor shall comply with the latest editions of the following:

1. ASTM D1784, Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
2. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
3. AWWA C900 (ANSI A21.4), Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.

#### 1.04 SUBMITTALS

A. Shop Drawings and Product Data:

1. Submittals shall contain the following at a minimum:
  - a. Size, class, and other details of pipe to be used.
  - b. Information on typical joint and harnessing details.
  - c. Description of proposed testing methods, procedures, and apparatus.

B. Tests: All test reports shall be submitted.

#### 1.05 DELIVERY, STORAGE AND HANDLING

A. Delivery, storage and handling of pipe, fittings, and specials shall be in complete compliance with the manufacturer's instructions.

B. All pipe, fittings and accessories shall be handled carefully with approved devices. The Contractor shall not drop or roll pipe off trucks or otherwise drop, roll, or skid pipe. Materials cracked, gouged, chipped, dented, or otherwise damaged shall not

- be used.
- C. Pipe, fittings, and specials shall be unloaded and stored as close to the place where they are to be laid as is practicable to avoid unnecessary handling. Interiors shall be kept free from dirt and foreign matter.
  - D. Piping shall be stored off the ground on wooden pallet or similar.

## **PART 2 – PRODUCTS**

### **2.01 PIPE**

- A. Pipe shall comply with the following standards:
  - 1. Material: ASTM D1784, Cell Classification 12454-B
  - 2. Class 235 DR 18, AWWA C900 for pipe sizes 4” – 12” diameter.
  - 3. Class 165 DR 25, AWWA C900 for pipe sizes 14” – 24” diameter.
- B. Joints shall be:
  - 1. ASTM D1689
  - 2. Type: Integral bell and spigot.
  - 3. Flexible seals: Elastomeric, conforming to ASTM F477.
  - 4. Lubricant: As recommended by manufacturer.
- C. Fittings shall be ductile iron as specified in Section 15042.
- D. Restrained joints shall be Series 2000 PV or 2000 SV MEGALUG mechanical joint thrust restraint as manufactured by EBAA Iron, Inc. or approved equal. Joints shall be furnished with 316 stainless steel T-bolts. All gland bodies, wedges, and wedge activators and bolts shall be fusion bonded epoxy coated. Restrained joints are required at all fittings and at distances indicated on the plans.

### **2.02 PIPE MARKING**

- A. All pipe shall be continually marked at five feet maximum intervals.
- B. Designations shall include:
  - 1. Pipe nominal size.
  - 2. Pipe pressure class or (S)DR designation.
  - 3. AWWA standard designation.
  - 4. ASTM standard designation
  - 5. PVC cell classification, as applicable.
  - 6. Manufacturer's name or trade name and code.

### **2.03 DETECTOR WIRE**

- A. Detector wire shall be minimum AWG 12-gauge solid copper, TWHN insulated. The wire shall be one continuous, unbroken length. The wire shall be high strength with minimum 450 lb. break load.

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION**

#### **A. General:**

1. The Contractor shall install piping as shown on the Drawings, as specified herein, and as recommended by the pipe manufacturer.
2. The Contractor shall request instructions from the Engineer before proceeding if there is a conflict between the Drawings or Specifications and the manufacturer's recommendations.
3. Minimum cover over piping shall be three feet unless otherwise shown or approved by the Engineer.
4. Sewer mains shall be laid at least 10' horizontally and 18" vertically from any water lines (water over sewer). Where water lines cross over sewer lines, the above requirements will be waived if pipe segments are centered to provide maximum spacing of the joints of both water and sewer lines and a vertical separation of at least 18" (water over sewer) is maintained

#### **B. Bedding:**

1. Excavation and bedding shall be as defined in Section 02300.

#### **C. Laying Pipe:**

1. The Contractor shall comply with manufacturer's instructions, technical specifications, and details on Contract Drawings.
2. Ground water level shall be at least six inches below bottom of trench. Pipe shall not be laid in water. A dry trench shall be maintained until jointing and backfilling are complete.
3. Bell and spigot pipe shall be placed so that bells face the direction of laying, unless otherwise approved by Engineer.
4. The Contractor shall excavate around joints in bedding and lay pipe so that only the barrel receives bearing pressure from the trench bottom.
5. Permissible deflections at joints shall not exceed the amount allowed by manufacturer.
6. The Contractor shall ensure that no foreign material enters the piping prior to and during installation.
7. Interior of all pipe and fittings shall be inspected and all dirt, gravel, sand, debris, or other foreign materials shall be completely removed from the pipe interior before it is moved into the trench.
8. Bell and spigot mating surfaces shall be thoroughly wire brushed and wiped clean and dry immediately before pipe is laid.
9. Every time that pipe laying is not actively in progress, the open ends of pipe shall be closed by a watertight plug.

#### **D. Restraints:**

1. The Contractor shall provide and install restrained joints as shown, specified, required, and as recommended by the manufacturer.



E. Transitions from One Type of Pipe to Another:  
The Contractor shall provide and install all necessary adapters, specials and connection pieces required when connecting different types and sizes of pipe.

F. Backfilling:  
1. Backfilling shall be as defined in Section 02300.

3.02 TESTING OF PIPING

A. Testing shall be as defined in Section 02580.

3.03 CLEANING AND DISINFECTION

A. Cleaning and disinfection shall be as defined in Section 02580.

**END OF SECTION**

## SECTION 15110

### VALVES AND APPURTENANCES

#### PART 1 – GENERAL

##### 1.01 Submittals

###### A. Shop Drawings:

1. Submit for approval detailed drawings, data, and descriptive literature on all valves and appurtenances, including:
  - a. Dimensions.
  - b. Size.
  - c. Materials of construction.
  - d. Weight.
  - e. Protective coating.

###### B. Manufacturer's Certificates:

1. Submit manufacturer's certificates of compliance with ANSI, AWWA and other Standards listed herein.

###### C. Manufacturer's Service Report:

1. Certify that valves are properly installed except as noted.
2. Recommend corrective action for any deficiencies noted.

###### D. Operation and Maintenance Data:

1. Submit a detailed operation and maintenance manual for all valves and appurtenances provided under this Section including the following information:
  - a. Product name and number.
  - b. Name, address and telephone number of manufacturer and local distributor.
  - c. Instruction bulletins for operation, maintenance, and recalibration.
  - d. Complete parts and recommended spare parts lists.

##### 1.02 Product Delivery, Storage and Handling

- A. Handle all valves and appurtenances with care.
- B. Valves and appurtenances which are cracked, chipped, distorted, or otherwise damaged or dropped will not be acceptable.

- C. Store all valves and appurtenances off the ground in enclosed shelter.

### 1.03 RELATED SECTIONS

13423 – Analysis and Instrumentation

09970 – Coatings

15042 – Ductile Iron Pipe

15064 – Plastic Pressure Pipe

15102 – Electric Actuators for Motorized Valves

## **PART 2 – PRODUCTS**

### A. BUTTERFLY VALVES

1. The butterfly valve shall fully conform to AWWA C504 (latest revision) and as described below, Pressure Class 150B or 250B as shown on the plans or in the valve schedule. The valve shall be NSF-61 certified for contact with drinking water and NSF-372 certified lead free.
2. The valve body have integral flanged connections (wafer or lugged type are not acceptable) conforming to ANSI/ASME B16.1 Class 125 or mechanical joint connections conforming to ANSI/AWWA A21.11/C111, as shown on the plans or in the valve schedule.
3. The valve body shall be made from ductile iron conforming to ASTM A536 Grade 65-45-12. Sizes 24-inch and smaller shall have a permanent, transfer molded and vulcanized EPDM-P rubber seat. Sizes 30-inch and larger shall have an EPDM-P rubber seat that is that is mechanically retained in the body without epoxy and field adjustable or replaceable using common hand tools
4. The valve disc shall be made from ductile iron conforming to ASTM A536 Grade 65-45-12 with a 316 stainless steel seat edge
5. Size 24-inch and smaller valve shafts shall be one-piece, larger sizes shall have upper and lower stub shafts. Shafts shall be made from Type 304 stainless steel in Class 150B valves and ASTM A564 Type 17-4PH stainless steel in Class 250B valves. The valve disc shall be attached to the shaft by multiple, mechanically secured stainless steel pins
6. The valve shall have upper and lower self-lubricating shaft bearings. Sizes 24” and larger shall be provided with an adjustable thrust bearing. The shaft shall be sealed with self-adjusting Buna-N or EPDM packing. The actuator

shall not be used to retain the packing and shaft packing leakage shall be prevented from entering the actuator.

7. Ferrous surfaces of the valve body and disc shall be factory coated with NSF-61 certified epoxy.
8. When shown on the plans or in the valve schedule, butterfly valves shall be operated by an electric motor or pneumatic actuator sized per AWWA C504, as specified elsewhere.
9. External fasteners shall be Type 316 stainless steel .
10. Warranty: The valve manufacturer shall warrant the valve to be free of defects in material and workmanship for a period of two years from date of shipment
11. Manufacturer: AWWA C504 Butterfly Valves shall be GA Industries Series 800 as manufactured by VAG USA, LLC Mars, PA USA, or equal.

B. GATE VALVES:

The following requirements are for gate valve sizes 3"-12"

1. Valves shall comply with ANSI/AWWA C515
2. approved by Factory Mutual Research Corporation (FM
3. listed by Underwriters Laboratories, Inc. (UL). Valves with actuators are not listed.
4. tested and certified to ANSI/NSF Standard 61 & 372.
5. suitable for potable water applications.
6. iron body, fully encapsulated resilient wedge type.
7. manufactured in the U.S.A. at an ISO9001 Certified factory.
8. Working temperature: 33°F minimum to 170°F maximum working temperature
9. Working Pressure: 350psi for AWWA, UL and FM
10. non-rising stem type
11. O-ring stem seals
12. have a 2" square wrench nut complying with AWWA C515. Optional hand wheels are available.

13. Flanged Ends with flange drilling complying to ASME B16.1 Class 125 (ISO PN10/PN16 drilling optional). Per ANSI/AWWA C111, working pressure above 250psi requires the use of a special gasket rated for the higher pressure
14. Mechanical Joint Ends complying with ANSI/AWWA C111/A21.11.
15. Inlet flange machined specifically for mating with Tapping Sleeves and Crosses. Raised ring on flange face complies with MSS SP-60. Drilling complies with ASME B16.1 Class 125 flange
16. Standard Mechanical Joint outlet connection complies with ANSI/AWWA C111/A21.11
17. Materials:
  - a. Cap screw – Stainless Steel Type 316.
  - b. Wrench nut – Ductile Iron, ASTM A-536.
  - c. Handwheel – Cast Iron, ASTM A-126, Class B.
  - d. Stuffing box – Ductile Iron, ASTM A-536.
  - e. Stem O-rings – Nitrile, ASTM D2000.
  - f. Anti-friction washers – Acetal.
  - g. Stem – Manganese Bronze, CDA Alloy C67600.
  - h. Bonnet – Ductile Iron, ASTM A-536.
  - i. Bonnet seal – O-ring, Nitrile, ASTM D2000.
  - j. Stuffing box bolts & nuts – Stainless Steel Type 316.
  - k. Bonnet bolts & nuts – Stainless Steel Type 316.
  - l. Disc nut – Bronze, ASTM B-584 Alloy C89833.
  - m. Guide cap bearings – Acetal.
  - n. Disc – 3” Cast Iron, ASTM A-126, Class B  
Ductile Iron, ASTM A-536.
  - o. Disc encapsulated – SBR ASTM D2000.
  - q. Body – Ductile Iron, ASTM A-536.
  - r. Coating – inside and outside of valve fully coated to comply with ANSI/AWWA C550 and valve is certified to ANSI/NSF Standard 61 & 372

#### C. CHECK VALVES

1. The swing check valve shall conform to the design, materials of construction and testing required by AWWA C508 (latest revision) plus be supplied with an outside lever, adjustable counterweight, and adjustable air-cushion chamber to minimize slam and hammer caused by rapid flow reversal.
2. The valve flow area anyplace through the valve shall be no less than the area of the nominal inlet pipe size when the disc has swung no more than 25 degrees away from the seat

3. The swing check valve shall be NSF-61 certified for contact with drinking water and NSF-372 certified lead free
4. The standard valve shall have the same size flanged inlet and outlet connections faced, drilled and of the thickness required by ANSI/ASME B16.1 Class 125 or Class 250, as shown on plans or in the valve schedule
5. Where shown on the plans or in the valve schedule, “increasing size” valves shall be supplied. Single increasing Class 125 flanged valves in sizes 3-inch to 10-inch shall have the outlet expanded one size and double increasing valves in sizes 4-inch to 8-inch size valves shall have the outlet expanded by two sizes
6. The valve body shall be made from cast iron conforming to ASTM A126 Class B with a bolted cover through which all internal parts can be removed for service. The body shall have a mechanically retained and replaceable Type 316 stainless steel seat ring
7. The hinge shaft shall be made from Type 303 stainless steel and be supported at both ends by non-corrosive, lead free bushings. The shaft shall be sealed where it passes through the body by compression packing retained by a packing gland, gland studs and nuts. Non-adjustable or O-ring shaft packing is not acceptable
8. A ductile iron disc arm shall be keyed to and suspended from the hinge shaft. A non-rotational, cast-iron disc with replaceable Buna-N rubber disc seat ring shall be attached to the disc arm by means of a center pin and nut providing 360-degree oscillation. The disc seat ring shall be retained by a Type 316 stainless steel follower ring and stainless-steel screws.
9. Valve closure shall be cushioned by the action of a bronze piston in a bronze cushion cylinder. The cushion chamber assembly shall be non-pivoting and be mounted to the side of the valve body on machined pads without the need for brackets. The amount of cushioning shall be adjustable. Pivoting and/or commercial pneumatic cylinders are not acceptable
10. Cover bolts, nuts and studs shall be zinc plated carbon steel
11. Manufacturer: Cushioned swing check valves shall be VAG/GA Industries Figure 250 (standard), 251 (single increasing), or 252 (double increasing) as manufactured by VAG USA, LLC Cranberry Township, PA USA

#### D. BALL VALVES

1. All thermoplastic ball valves shall be True Union 2000 Industrial type manufactured to ASTM F 1970 and constructed from PVC Type I, ASTM

D1784 Cell Classification 12454 or CPVC Type IV, ASTM D 1784 Cell Classification 23447.

2. All O-rings shall be EPDM or FKM. All valves shall have Safe-T-Shear® stem with double O-ring stem seals.
3. All valve handles shall be polypropylene with built-in lockout mechanism.
4. All valve union nuts shall have Buttress threads.
5. All seal carriers shall be Safe-T-Blocked® .
6. All valve components shall be replaceable.
7. All EPDM valves shall be certified by NSF International for use in potable water service.
8. All 1/2" through 4" valves shall be pressure rated to 235 psi, all 6" and 8" Venturied and all flanged valves shall be pressure rated to 150 psi for water at 73°F.

#### E. WELL SERVICE AIR VALVES

1. Well Service Air Valves suitable for pressures up to 400 psig (2760 kPa) clean or raw water pump discharge service
2. Well Service Air Valves shall be fully automatic float operated valves designed to exhaust air which is present in the pump column on pump startup and allow air to re-enter the column on pump shutdown or should a negative pressure occur.
3. Well Service Air Valves shall be fully automatic float operated valves designed to exhaust air which is present in the pump column on pump startup and allow air to re-enter the column on pump shutdown or should a negative pressure occur
4. The Dual Port Throttling Device (3 in. and smaller valves) shall provide adjustable control of the exhaust rate and allow free flow into the valve through a separate inlet port. The Regulated Exhaust Device (4 in. and larger valves) shall allow free air flow in and out of the valve, close upon rapid air exchange, and control the air exhaust rate to reduce pressure surges
5. Valves shall be manufactured and tested in accordance with American Water Works Association (AWWA) Standard C512
6. Valves used in potable water service shall be certified to NSF/ANSI 61 Drinking Water System Components – Health Effects

7. Manufacturer shall have a quality management system that is certified to ISO 9001 by an accredited, certifying body
8. Valve sizes 3 in. (76 mm) and smaller shall have full size NPT inlets and outlets equal to the nominal valve size. The body inlet connection shall be hexagonal for a wrench connection
9. Valve sizes 4 in. (100 mm) and larger shall have bolted flange inlets equal to the valve size. Flanges shall be in accordance with ANSI B16.1 for Class 125 or Class 250 iron flanges and ANSI B16.42 for Class 300 ductile iron flanges
10. Valve sizes 6 in. (150 mm) and smaller shall have NPT outlets; larger valves shall have ANSI B16.1 Class 125 outlet flanges
11. The valve shall have two additional NPT connections for the addition of Air Release Valves, gauges, testing, and draining
12. The valve body shall provide a through flow area equal to the nominal valve size. A bolted cover with alloy screws and flat gasket shall be provided to allow for maintenance and repair
13. Floats shall be unconditionally guaranteed against failure including pressure surges. The float shall have a hexagonal guide shaft supported in the body by circular bushings to prevent binding from debris. The float shall be protected against direct water impact by an internal baffle
14. The resilient seat shall provide drop tight shut off to the full valve pressure rating. The seat shall be a minimum of .5 in. (12 mm) thick on 2 in. (50 mm) and larger valves and secured in such a manner as to prevent distortion. Valves with working pressures above 400 psig (2760 kPa) shall have metal seats with synthetic seals
15. On valve sizes 4 in. (100 mm) and larger, the cover shall be fitted to the valve body by means of a machined register to maintain concentricity between the top and bottom guide bushings at all times. The float shall be double guided with a guide shaft extending through the float to prevent any contact with the body. A resilient bumper shall be provided to cushion the float during sudden opening conditions
16. Valves 3 in. (75 mm) and smaller will be equipped with a dual port throttling device to control the discharge of air from the valve and allow full vacuum flow through a separate port. The device shall have an externally adjustable screw and locknut for adjusting the discharge control disc. The disc shall be sized to allow a 5% flow area when fully throttled. The vacuum port shall be equipped with a spring-loaded disc to allow flow into the valve during negative pressure conditions



17. Throttling devices with a common exhaust and vacuum port are not acceptable. The material of the body shall be consistent with the Well Service Air Valve. The spring shall be ASTM A313 Type 316 Stainless Steel
18. Valves 4 in. (100 mm) and larger will be equipped with a Regulated Exhaust Device to prevent valve pressure surges due to rapid changes in velocity and pressure
19. The Device shall be mounted on the inlet of the Well Service Air Valve, allow free air flow in and restricted flow out of the valve to reduce valve pressure surges
20. The Device shall be a flanged, globe pattern, with a center guided disc and seat assembly. The disc shall have threaded holes to provide adjustment of the flow rate through the valve
21. The material of the body shall be consistent with the Well Service Air Valve. The seat and disc shall be Bronze ASTM B584, alloy C83600
22. The Well Service Air Valve body, cover, and baffle shall be constructed of ASTM A126 Class B cast iron for Class 125 and Class 250 valves. Class 300 ductile iron valves shall be constructed of ASTM A536 Grade 65-45-12 cast ductile iron
23. The float, guide shafts, and bushings shall be constructed of Type 316 stainless steel. Non-metallic guides and bushings are not acceptable. Resilient seats shall be Buna-N.
24. Valve interiors and exteriors shall be coated with an NSF/ANSI 61 certified fusion bonded epoxy in accordance with AWWA C550 when specified
25. Low Durometer seat shall be furnished for low pressure applications
26. All Air (Release, Vacuum, etc) Valves installed in vaults or flood prone locations shall include an inflow preventer to prevent the introduction of contaminated water through the air valve outlet. The inflow preventer shall allow the admittance and exhausting of air while preventing contaminated water from entering during normal operating conditions. The inflow preventer shall be flow tested by an independent third party to certify performance. The third party shall be an approved testing lab of the American Society of Sanitary Engineers
27. The manufacturer shall demonstrate a minimum of five (5) years' experience in the manufacture of air valves. When requested, the manufacturer shall provide test certificates, dimensional drawings, parts list drawings, and operation and maintenance manuals
28. The exterior of the valve shall be coated with a universal alkyd primer

29. Well Service Air Valves shall be Series 100ST and 104SS as manufactured by Val-Matic Valve and Manufacturing Corporation, Elmhurst, IL, USA or approved equal

F. AIR / VACUUM VALVES

1. Air/Vacuum valves shall be fully automatic float operated valves designed to exhaust large quantities of air during the filling of a piping system and close upon liquid entry. The valve shall re-open during draining or if a negative pressure occurs. [NOTE: See Air Release Valves for releasing air during system operation and Combination Air Valves for both air release and air/vacuum functions.]
2. Valves shall be manufactured and tested in accordance with American Water Works Association (AWWA) Standard C512.
3. Valves used in potable water service shall be certified to NSF/ANSI 61 Drinking Water System Components - Health Effects.
4. Manufacturer shall have a quality management system that is certified to ISO 9001 by an accredited, certifying body.
5. Valve sizes 3 in. (76 mm) and smaller shall have full size NPT inlets and outlets equal to the nominal valve size. The body inlet connection shall be hexagonal for a wrench connection.
6. Valve sizes 4 in. (100 mm) and larger shall have bolted flange inlets with threaded or plain outlets and protective hoods to prevent debris from entering the valve. Flanges shall be in accordance with ANSI B16.1 for Class 125 or Class 250 iron flanges and ANSI B16.5 for Class 150 or Class 300 steel flanges
7. The valve shall have two additional NPT connections for the addition of Air Release Valves, gauges, testing, and draining
8. The valve body shall provide a through flow area equal to the nominal valve size. A bolted cover with alloy screws and flat gasket shall be provided to allow for maintenance and repair.
9. Floats shall be unconditionally guaranteed against failure including pressure surges. The float shall have a hexagonal guide shaft supported in the body by circular bushings to prevent binding from debris. The float shall be protected against direct water impact by an internal baffle.
10. The resilient seat shall provide drop tight shut off to the full valve pressure rating. The seat shall be a minimum of .5 in. (12 mm) thick on 2 in. (50 mm) and larger valves and secured in such a manner as to prevent distortion.

Valves with working pressures above 400 psig (2760 kPa) shall have metal seats with synthetic seals.

11. On valve sizes 4 in. (100 mm) and larger, the cover shall be fitted to the valve body by means of a machined register to maintain concentricity between the top and bottom guide bushings at all times. The float shall be double guided with a guide shaft extending through the float to prevent any contact with the body. A resilient bumper shall be provided to cushion the float during sudden opening conditions.
12. The valve body, cover, and baffle shall be constructed of ASTM A126 Class B cast iron for Class 125 and Class 250 valves. Class 300 ductile iron valves shall be constructed of ASTM A536 Grade 65-45-12 ductile iron. Class 300 steel valves shall be constructed of ASTM A216 Grade WCB cast steel.
13. The float, guide shafts, and bushings shall be constructed of Type 316 stainless steel. Non-metallic guides and bushings are not acceptable. Resilient seats shall be Buna-N. Class 300 steel valves shall have a 316 stainless steel Seat with Buna-N seal to provide an initial contact to Buna-N with final metal to metal contact to prevent over compression of the resilient seal.
14. An optional Regulated Exhaust Device shall be provided when specified to reduce pressure surges due to column separation or rapid changes in velocity and pressure in the pipeline
15. The Regulated Exhaust Device shall be mounted on the inlet of the Air/Vacuum Valve, allow free air flow in and out of the valve, close upon rapid air exhaust, and control the air exhaust rate to reduce pressure surges
16. The device shall have a flanged globe-style body with a center guided disc and seat assembly. The disc shall have threaded holes to provide adjustment of the air exhaust rate through the valve. The holes shall provide for a flow area of 5% of the nominal valve size.
17. The material of the body shall be consistent with the Air/Vacuum Valve. The seat and disc shall be bronze.
18. A flanged or screwed outlet connection shall be provided when specified for vault piping.
19. A stainless-steel screened outlet shall be provided when specified for outdoor Installations.
20. Optional body materials include ASTM A536 Grade 65-45-12 ductile iron, ASTM A351 Grade CF8M stainless steel, and ASTM B584 Alloy 836 cast bronze.

21. An optional threaded hood with screen on 1/2 - 4 in (13-100mm) valves when specified.
22. An optional isolation valve shall be furnished under the Air/Vacuum valve when specified. For sizes with threaded inlets, the isolation valve shall be a fully-ported brass ball valve. For sizes with flanged inlets, the isolation valve shall be an AWWA class 150B or 250B Butterfly Valve with quarter-turn gear actuator and handwheel.
23. Valve interiors and exteriors shall be coated with an NSF/ANSI 61 certified fusion bonded epoxy in accordance with AWWA C550 when specified.
24. Low Durometer seat shall be furnished for low pressure application.
25. All Air (Release, Vacuum, etc) Valves installed in vaults or flood prone locations shall include an inflow preventer to prevent the introduction of contaminated water through the air valve outlet. The inflow preventer shall allow the admittance and exhausting of air while preventing contaminated water from entering during normal operating conditions. The inflow preventer shall be flow tested by an independent third party to certify performance. The third party shall be an approved testing lab of the American Society of Sanitary Engineers.
26. The manufacturer shall demonstrate a minimum of five (5) years' experience in the manufacture of air valves. When requested, the manufacturer shall provide test certificates, dimensional drawings, parts list drawings, and operation and maintenance manuals.
27. The exterior of the valve shall be coated with a universal alkyd primer.
28. Air/Vacuum Valves shall be Series 100 as manufactured by Val-Matic Valve and Manufacturing Corporation, Elmhurst, IL, USA or approved equal.

## 2.02 APPURTENANCES

### **PART 3 - EXECUTION**

#### 3.01 Installation

- A. Install all valves and appurtenances in accordance with manufacturer's instructions.
- B. Install suitable corporation stops at all points shown and required where air binding of pipelines might occur
- C. Unless otherwise approved install all valves plumb and level. Valves shall be installed free from distortion and strain caused by misaligned piping, equipment, or other causes.

- D. Valve boxes shall be set plumb and centered with the bodies directly over the valves. Earth fill shall be carefully tamped around each valve box to a distance of four feet on all sides of the box, or to the undisturbed trench face, if less than four feet

### 3.02 Field Test and Adjustments

- A. Adjust all parts and components as required correct operation.
- B. A factory-trained representative shall be made available for start-up service, inspection and necessary adjustments. Representative shall provide operator training class.

**END OF SECTION**

## SECTION 15120 - RESERVOIR MIXER

### PART 1 – GENERAL

#### 1.1 SCOPE

- A. This section covers the submersible reservoir/tank mixing systems up to 1.5 HP in size intended for continuous use while submersed in potable water storage tanks. Mixer will operate 24 hours a day, 7 days per week. Each mixer shall consist of a water-lubricated submersible motor, an impeller, and a non-submersible control center that houses all controller electronics. Oil filled and non-water lubricated mixers shall not be acceptable.

#### 1.2 THE REQUIREMENT

- A. CONTRACTOR shall furnish a tank mixer with a control center and install mixer together with control center and accessories necessary for operable system for each tank.
- B. UTILITY shall furnish electrical conduit with either 115VAC or 230VAC single phase voltage based on system configuration, a safety disconnect switch and a 20amp non-GFCI circuit breaker up to the point of installation of the mixing system control center.
- C. UTILITY shall also provide conduit from control center to tank penetration for submersible motor cable and penetration through tank for same cable.

#### 1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Classified UL Water Quality NSF/ANSI 61, NSF/ANSI 372
- B. Underwriters Laboratories Inc., UL 508A
- C. NEMA Type 3R, 4, and 12
- D. CSA Type 3R, 4, and 12

#### 1.4 CONTRACTOR SUBMITTALS

- A. NSF Certification
  - 1. Copy of the NSF/ANSI-61 and NSF/ANSI 372 certified listing for reservoir mixer being placed inside the tank.
- B. Installation, O & M's shall be obtained from the equipment manufacturer
  - 1. General equipment specifications and data sheets
  - 2. Installation, start-up, operation, and maintenance instructions

3. Factory-recommended maintenance schedule
4. Wiring diagram

## 1.5 QUALITY ASSURANCE

- A. Each reservoir mixer shall be tested prior to shipment.
- B. Complete mixing system is NSF/ANSI Standard 61 certified.

## 1.6 WARRANTY

- A. For the period beginning with shipment to buyer and ending at the time frame listed below, the reservoir mixer is warranted to be free from shortcomings in material and workmanship and to coincide to manufacturers specifications.
  1. Three (3) years on all supplied parts
  2. One full year labor
  3. Lifetime warranty on impeller

## **PART 2 – PRODUCTS**

### 2.1 PERFORMANCE

- A. Reservoir mixer shall completely mix reservoir according to the following minimum performance requirements. These requirements can be measured and validated after installation by operators with readily available tools such as temperature probes and total chlorine grab samplers.

1. Temperature Uniformity

For tanks up to 4,000,000 gallons in volume: All temperatures shall converge to within 0.50°C (0.9°F) within 24 hours after mixer is installed and activated.

2. Disinfectant Residual Uniformity

For tanks up to 6,000,000 gallons in volume: Disinfectant residual within top five feet of tank and bottom five feet of tank will converge to within 0.20 ppm within 24 hours after mixer is installed and activated. During continuous operation of the mixer, under normal disinfectant dosing parameters, disinfectant residual will converge to within 0.20 ppm at least once every 24 hours.

## 2.2 GENERAL

- A. Reservoir mixer consists of an impeller mounted on a submersible motor and supported thirty (30) inches from the tank floor in order for it to launch a jet of water from the bottom of the tank up toward the surface of the water. Mixer control and operation shall be independent of tank drain and fill cycles to ensure constant mixing. Wet-side of mixer shall weigh less than 40 pounds and dry-side shall weigh less than 30 pounds for safety of installation. Both wet-side and dry-side shall be able to be hoisted, installed, and/or removed by on-site personnel without additional equipment needed so that there is no crush hazard or entanglement hazard present, and so that weight of mixer on tank floor does not cause damage to interior coating.
- B. Mixer shall utilize a VFD control center to maximize mixing efficiency. Constant speed mixers will not be accepted.
- C. Reservoir mixer active components shall be elevated at a minimum of 30 inches above tank floor to avoid disturbing accumulated tank sediment or entraining particles and causing accelerated wear of moving parts. Tripod configurations shall not be acceptable.
- D. Mixers using submersible pump with slit or “water sheet” or horizontal motor mounting designs are not acceptable.
- E. The use of an unstable tripod as a base shall not be used to assure no damage to tank coatings.
- F. Mixer shall produce 40 lbs. of downward thrust while mixing.
- G. Oil-filled motors shall not be acceptable.
- H. All wet-side mixer components shall be certified to the NSF/ANSI Standard 61 and 372. .
- I. Power for mixer shall be 120VAC single phase grid power.
- J. No maintenance shall be required on the wet-side components in typical potable water application.
- K. Passive mixing system shall not be acceptable.
- L. Pumped water or jet mixers shall not be acceptable.

## 2.3 CONSTRUCTION

- A. Components – wet-side: Shall be NSF/ANSI Standard 61 certified.



Equipment entering tank shall not adhere to, scratch, or otherwise cause any damage to internal tank coating or put undue stress on the materials of the tank construction. Equipment shall fit through a standard hatch of size 24-inch x 24-inch or larger. UTILITY may prefer to penetrate side wall or ceiling of tank (in place of penetrating the hatch) to allow motor cable entry into the tank for ease of installation and protection against freezing/ice damage.

Each submersible mixer shall consist of the following components, regardless of the power source selected:

1. Impeller

Balanced to within 0.5 gram-inches

Not more than 1.5 inches in overall height

Not more than 5.0 inches in diameter

Not more than 2 oz. in weight

Shall not create cavitation at any rotational speed up to 3450 RPM

2. Motor

AISI Type 304 stainless steel body

Chlorine/Chloramine resistant rubber seals

Fully submersible

Low power (1.5 HP maximum)

Water-lubricated motor

3. Mounting

Mixer Frame shall be constructed High density Polyethylene

Secure motor cable away from impeller without the use of fasteners or ties

Overall weight of wet-side unit not to exceed 40 lbs. for ease of installation and operator safety when installing

Overall height of unit shall not exceed 42 inches. including lifting arm

B. Components – dry-side: Each 120VAC control center shall consist of the following components:

1. Enclosure
  - a. Type (Type 3R) lockable
  - b. Weather resistant
  - c. Overall weight of control center not to exceed 40 lbs.
  - d. Green and Red LED Indicator lights show motor status
  - e. Cooling fan
  - f. Power Switch located inside of panel
  
2. Motor Controller/VFD
  - a. Rated to 2.0 HP
  - b. Operating temperature range -4 °F to 131 °F (-20 °C to 55 °C)
  - c. Start/stop switch mounted internally
  - d. Manual speed control
  - e. Built in thermal shut-off protection
  - f. Built in current overload protectionSCADA outputs included:
  - i. Digital output signal indicating motor running
  - ii. 4-20mA signal
  
3. Branch Circuit Protection
  - a. Panel equipped with a 120VAC 20-Amp main breaker

## 2.4 CONTROLS

- A. Each unit shall be equipped with all necessary controls, inter-wired, to provide the following minimum functions:
  1. On/Off switch to control power to mixer.
  2. Alarm dry contact to indicate mixer running.
  3. 4:20 mA signal to indicate mixer current draw

## 2.4 MANUFACTURERS

- A. Big Wave Water Technologies Model TWM15050.

## **PART 3 – EXECUTION**

### 3.1 INSTALLATION

- A. The CONTRACTOR shall furnish services of a factory-trained installation contractor or crew having experience with installation procedures, operations, and maintenance requirements for the type of equipment installed under these specifications. Mixer must be able to be installed through a 24”x24” hatch. Mixer must be able to be installed without draining tank or taking tank out of service. Wet-side of mixer shall

weigh less than 40 pounds and dry-side shall weigh less than 42 pounds. Both wet-side and dry-side shall be able to be hoisted, installed, and/or removed by on-site personnel without additional equipment needed so that there is no crush hazard or entanglement hazard present, and so that weight of mixer on tank floor does not cause damage to interior coating.

- B. Tank penetration is recommended to be above tank water line, typically through the hatch side wall.
  - 1. Fitting will prevent moisture intrusion into tank and ideally be horizontally oriented.
  - 2. Fitting shall be 1" diameter fitting to allow cable to pass through.
  - 3. A water-tight penetration may be installed under the water line.
- C. Installation of the in-tank components may be performed in any of the following ways:
  - 1. Installation by a factory-trained and drinking-water-certified potable water tank diver.
  - 2. Installation by personnel with confined space training while the tank is drained and empty.
  - 3. Installation below a hatch opening in a full tank
- D. Installation of the outside-of-tank components may be performed by:
  - 1. Third party representatives or CONTRACTORS according to the manual provided.
  - 2. UTILITY personnel according to the manual provided
  - 3. Safety disconnect provided by others
- E. The mixer and control center shall be installed in accordance with approved procedures submitted and as shown, unless otherwise approved in writing.

### 3.2 TRAINING

- A. Manufacturer personnel (or representative) will direct designated personnel in the correct operation of the reservoir mixer. This instruction will cite the operations manual provided with equipment and show how to check for correct operation of the equipment. The Contractor shall provide the following minimum manufacturer's representative service requirements:
  - 1. Four (4) hours on site for start-up and training.
  - 2. Four (4) hours on site for operator training.

**END OF SECTION**

## SECTION 15183

### GAUGES

#### PART 1 – GENERAL

##### 1.1 - DESCRIPTION

- A. The Contractor shall furnish all labor, materials, equipment and incidentals required to provide all gauges and appurtenances as shown on the Drawings and as specified herein.

##### 1.2 - QUALITY ASSURANCE

- A. Manufacturer's Qualifications:
- B. Gauges and appurtenances shall be the standard product in regular production by manufacturers whose products have proven reliable in similar service.
- C. All gauges and appurtenances shall be provided by a single supplier.
- D. All gauges and appurtenances shall be new and unused.

#### PART 2 - PRODUCTS

##### 2.1 - GAUGES

- A. Bosses, connections, or nipples for gauges shall be provided as acceptable to the Engineer. Unbossed tappings shall not be used.
- B. Gauges shall be furnished as part of a complete factory assembly, including gauge, liquid fill, diaphragm seal, isolation valve, and threaded 316 stainless steel connecting piping.
- C. The Contractor shall furnish supports, or attach gauge assemblies to the water piping supports, where applicable.
- D. Gauges shall be as shown in the instrument schedule on the Drawings.
- E. Liquid service pressure gauges shall have a Type 304 stainless steel case that shall be 4½ inch nominal diameter. Pressure gauges shall have a full-sized Type 316 stainless steel Bourdon tube, and a 400 series stainless steel movement. The gauges shall be liquid filled with glycerin, unless otherwise noted, and shall be provided with a filler/breather cap. The socket shall be ½ inch NPT Type 316 stainless steel with a bottom connection, and the dial shall be a white background with black markings. The dial shall have units as shown in the instrument schedule on the Drawings. Gauges shall have a clear crystal window. Gauges

shall be ANSI Grade A plus or minus 1 percent of scale and shall have a blow-out back design.

- F. Gas service gauges shall be as required for liquid service, except that materials and liquid fill shall be as required for the particular gas service. Chlorine gas service shall have Monel tube and socket, with Halocarbon fill.

## **2.2 - DIAPHRAGM SEALS FOR GAUGES**

- A. Diaphragm seals shall be installed for all gauges, for protection from contact with the fluid in the pipeline. Glycerin, unless otherwise noted, shall fill between the diaphragm seal and the gauge.
- B. Diaphragm seals shall be minimum 3½ inch diameter. The diaphragm seal shall have threaded connections for both piping and gauges. A ¼ inch back-flushing threaded connection with plug shall be included. Plug material shall match that of the housing.
- C. Diaphragm seals shall have an upper and lower housing of Type 316 stainless steel. Clamps, bolts, and nuts shall be Type 304 stainless steel. Diaphragms shall be Teflon, unless otherwise noted.
- D. Interconnecting piping size and diaphragm tap size shall match the size of the gauge tap on the equipment or pipe and shall not be less than ½ inch. A Type 316 stainless steel isolation ball valve and union fitting between the pipeline or equipment and the diaphragm seal shall be included.
- E. For chlorine service, diaphragm seals shall be tantalum. Chlorine service housing shall be Monel Type 400 for both lower and upper sections. Chlorine service filling fluids shall be of the inert type that will not oxidize in the presence of chlorine, such as Halocarbon or Fluorolube. Chlorine service assembly shall be furnished with Monel 400 bar stock needle valve isolation.
- F. Diaphragm seals shall be as shown in the instrument schedule on the Drawings.

## **2.3 - PRESSURE TRANSMITTERS**

- A. Pressure transmitters shall have the following characteristics and functionality:
  - 1. 4-20 mA HART communication outputs
  - 2. ½ - 14 NPT power conduit entry
  - 3. Pressure range of 0-150 psi
  - 4. Ambient temperature limit -40 to 185 °F
  - 5. 0-100 percent relative humidity
  - 6. 316L Stainless Steel NPT female connection to process piping
  - 7. 316L Stainless Steel isolating diaphragm
  - 8. LCD display with local operator interface

9. Stainless steel mount bracket and bolts
10. Reference accuracy of  $\pm 0.075$  percent of calibrated span
11. Vibration effect of less than  $\pm 0.1$  percent
12. Power supply effect of less than  $\pm 0.005$  percent
13. Enclosure meeting NEMA 4X requirements
14. Buna-N O-rings
15. Silicone fill fluid

B. Pressure transmitters shall be NSF certified (drinking water)

### **PART 3 – EXECUTION**

#### **3.1 - INSTALLATION**

The Contractor shall install all gauges and appurtenances in accordance with the manufacturer's instructions.

**END OF SECTION**

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## SECTION 16010 - BASIC ELECTRICAL REQUIREMENTS

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Provisions of Division 01 apply to this section
- B. Section Includes: This section provides basic electrical requirements.

#### 1.02 BASIC ELECTRICAL REQUIREMENTS

- A. Quality Assurance:
  - 1. Workers possessing the skills and experience obtained in performing work of similar scope and complexity shall perform the Work of this Division.
  - 2. Refer to other sections of the Specifications for other qualification requirements.
- B. Drawings and Specifications Coordination:
  - 1. For purposes of clearness and legibility, Drawings are essentially diagrammatic and the size and location of equipment is indicated to scale whenever possible. Verify conditions, dimensions, indicated equipment sizes, and manufacturer's data and information as necessary to install the Work of this Division. Coordinate location and layout with other Work.
  - 2. Drawings indicate required size and points of termination of conduits, number and size of conductors, and diagrammatic routing of conduit. Install conduits with minimum number of bends to conform to structure, avoid obstructions, preserve headroom, keep openings and passageways clear, and comply with applicable code requirements.
  - 3. Routing of conduits may be changed provided that the length of any conduit run is not increased more than 10 percent of length indicated on the Drawings.
  - 4. Equipment and connection locations shall be coordinated with construction elements prior to start of construction. Locations indicated on the Drawings may be distorted for clarity.
  - 5. Coordinate electrical Work with all other Work.
  - 6. The scope of the electrical work includes furnishing, installing testing and warranty of all Electrical work and complete electrical systems shown on the electrical drawings and specified herein.
  - 7. The drawings and specifications complement each other and together complete the contract documents for the electrical work included in this project. Neither the drawings or the specifications are complete without the other. Any item mentioned in either document is binding. Where conflicts arise between the drawings and the specifications, the more stringent requirement shall prevail.
  - 8. The contractor shall provide and install all electrical systems to provide a complete package as indicated by the contract documents. The documents are intended to provide an outline for the required installations. The contractor shall



ultimately provide a complete and operational system at the conclusion of the project.

9. Details are provided as they relate to the installation. Contractor shall provide and install all miscellaneous components, parts, materials, fasteners, splices, and any other incidental items necessary to provide a complete installation.

C. Terminology:

1. Low Voltage: Applies to signal systems operating at 120 volts and less, and power systems operating at less than 600 volts.
2. UL: Underwriter's Laboratories Inc, Nationally Recognized Testing Laboratory (NRTL), or equal.

D. Regulations: Work shall comply with the requirements of authorities having jurisdiction and the Electrical and Building Codes. Material shall conform to regulations of the National Board of Fire Underwriters for electrical wiring and apparatus. Materials shall be new and listed by UL, or another NRTL.

E. Structural Considerations for Conduit Routing:

1. Where conduits pass through or interfere with any structural member, or where notching, boring or cutting of the structure is necessary, or where special openings are required through walls, floors, footings, or other elements, contractor shall submit shop drawings to the engineer for approval.

F. Electrically Operated Equipment and Appliances:

1. Furnished Equipment and Appliances:

- a. Work shall include furnishing and installing wiring enclosures for, and the complete connection of electrically operated equipment and appliances and electrical control devices which are specified to be furnished and installed in this or other sections of the Specifications, wiring enclosures shall be concealed except where exposed Work is indicated on the Drawings.
- b. Connections shall be provided as necessary to install equipment ready for use. Equipment shall be tested for proper operation and, if motorized, for proper rotation. If outlets are of incorrect electrical characteristics or any specified equipment fails to operate properly, repair and/or replace the outlet and/or equipment.

2. Equipment and Appliances Furnished by Others:

- a. Equipment and appliances indicated on Drawings as "not in contract" (NIC), "furnished by others," or "furnished by the Owner," will be delivered to the Project site. Required electrical connections shall be performed for such equipment and appliances. Motorized equipment will be furnished factory-wired to a control panel or junction box unless otherwise indicated. Appliances will be furnished equipped with portable cord and cap. Provide disconnect switches where required.
- b. Connections to equipment furnished under this Division shall be part of the Work of this section. Work shall include internal wiring, installation, connection and adjustment of bolted drive motors in which the motor is

supplied as a separate unit, and connections only for equipment furnished with factory installed internal wiring, except as further limited by Drawings and this Specification. Work shall include furnishing and installing suitable outlets, disconnecting devices, starters, push-button stations, selector switches, conduit, junction boxes, and wiring necessary for a complete electrical installation. Work shall also include furnishing and installing conduit and boxes for control systems, furnished under other Divisions. Devices and equipment furnished shall be of same type used elsewhere on the Work or as specified.

- c. Electrical equipment furnished under other sections, for installation and connection under Work of this section, will be delivered to the Project site ready for installation.
- d. Equipment furnished under other sections, and requiring electrical connection under this section, will be set in place as part of the Work of the section furnishing such equipment unless noted otherwise. If electrical connections exceed the requirements of the specified equipment, it shall be the responsibility of the contractor or vendor supplying the equipment to compensate the electrical contractor for any and all work to make the electrical connections to the equipment being supplied. Any discrepancies shall immediately be brought to the engineers' attention for coordination between all other disciplines. All increased costs shall be the responsibility of the contractors, not the owner or engineer.
- e. Suitability and condition of equipment furnished under other sections shall be determined in advance of installation. Immediate notice of damage, unsuitability, or lack of parts shall be given to the entity providing such equipment.

G. Protection of Materials:

1. Protect materials and equipment from damage and provide adequate and proper storage facilities during progress of the Work. Damaged materials and/or equipment shall be replaced.

H. Cleaning:

1. Exposed parts of Work shall be left in a neat, clean, usable condition. Finished painted surfaces shall be unblemished and metal surfaces shall be polished.
2. Thoroughly clean parts of apparatus and equipment. Exposed parts to be painted shall be thoroughly cleaned of cement, plaster, and other materials. Remove grease and oil spots with solvent. Such surfaces shall be wiped and corners and cracks scraped out. Exposed rough metal shall be smooth, free of sharp edges, carefully steel brushed to remove rust and other spots, and left in proper condition to receive finish painting.
3. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

I. Permits and Regulations:

1. Include payment of all permit and inspection fees applicable the work in this Division.
2. Work must conform to the National Electric Code, National Electrical Safety Code, and other applicable local, state, and federal laws, ordinances, and regulations. Where drawings or specifications exceed code requirements, the drawings and specifications shall govern. No work shall be installed which is less than minimum legal standards.
3. All work performed under this Division shall be inspected and approved by the Local Authority having Jurisdiction.

J. Site Inspection:

1. Each and all bidders shall inspect the project site prior to bidding.
2. Existing site conditions shall be compared with the information shown on the drawings. Immediately report any discrepancies to the engineer. After project bid date, no allowances will be made for failure to have made inspections.
3. During construction, the contractor shall exercise care and take appropriate precautionary measures to prevent any damage to the existing structures, sidewalks, utilities, communications, etc. during the project. The Contractor shall correct all damage caused by or during the project. Contractor shall provide not less than (2) and not more than (10) working days advance written, electronic, or telephonic notice of the commencement, extent, location and duration of the excavation work to Louisiana One-Call System and any nonmembers operator(s) of any underground utility lines or underground facilities in and near the excavation area, so that Louisiana One-Call System operator(s) and any non-member operator(s) may locate and mark the location of underground utility lines and underground facilities in the excavation area.

K. Utility Company Coordination and Fees:

1. Contractor shall inspect and verify the existing utilities at the project site prior to bidding.
2. Where applicable, the contractor shall contact the local utility companies to verify service arrangements with each. Install all service entrance conduits, pads, duct banks, etc, to meet the requirements of the respective utility company. In instances where contract documents' requirements are more stringent that utility company requirements, the drawings and specifications shall take precedence.
3. The contractor shall be responsible for and shall include in his bid any and all utility company fees required to provide connections for the project. Contractor shall be responsible for any fees assessed by the utility companies. The Engineer or Owner shall not be responsible for any fees assessed by the utility companies.
4. The Contractor must coordinate with owner during the project for connection of permanent power to the facility, however, the contractor shall not utilize the permanent utilities unless written permission is granted by the owner. The local utility and authority having jurisdiction shall approve when permanent power may be installed in order to provide electrical start-up and check-out of

equipment. Upon written permission of use of permanent electrical power, contractors shall pay any charges for power consumption while utilizing permanent power until the building or facility has been accepted by the owner.

L. Temporary Power for Construction:

1. The electrical subcontractor shall provide and install temporary power during the construction period as required to complete the project installation. Contractor shall coordinate with the general contractor, utility company, and/or owner to provide 120/240 volt power for the project. All devices shall be provided with ground fault circuit protection. Power shall be provided in central work area(s). This shall not include any remote power needs for any specific trades. For power requirements at voltages other than those listed above, the contractor shall coordinate connection requirements with the local utility company.
2. All temporary power installations shall meet local and national codes and be approved by the local authority having jurisdiction.
4. Temporary services shall be removed at completion of the project. Permanent utilities shall not be used during the Project except with the written permission of the Owner.

1.03 SUBMITTALS

- A. Where indicated submit to engineer, (7) copies of Shop Drawings including control diagrams, list of materials, catalog cuts, technical data, manufacturer's specifications, and applicable installation details.

1.04 RECORD DRAWINGS

- A. The Electrical subcontractor shall maintain, at the project site, a separate set of prints of the contract documents and shall show all changes and variations, in a neat and clearly discernible manner, which are made during construction. Upon completion of the work, these drawings shall be turned over to the Engineer. Provide the following as-built documents including all contract drawings regardless of whether corrections were necessary and include in the transmittal: "2 sets of CDs and prints for Owner's use, one set of CDs, prints for Engineers Records". Delivery of these as-built electronic files and prints are a condition of final acceptance.

1.05 OPERATION AND MAINTENANCE MANUALS

- A. The Electrical subcontractor shall submit to engineer (3) copies each of operating and maintenance manuals for each piece of equipment applicable to the project.
- B. All shop drawings, installation, operation, and maintenance manuals, wiring diagrams, parts lists, and other information including warranties and technical support, shall be obtained from each manufacturer.
- C. Assemble all information into three-ring binders or other suitable binding. Add an index and/or tabbed and labeled sections of all items submitted.
- D. The Electrical subcontractor shall at all times, maintain a clean set of construction document plans on site. Any and all deviations from the construction documents shall be marked, and clearly noted in red ink. All changes shall exactly indicate the revisions or

changes to the design documents. Upon completion of the project, (2) clean sets of "red-line" construction as-built documents shall be submitted to the engineer. Unclear, illegible, or inaccurate plans will be returned to the contractor for correction and resubmission. As-built documents shall be corrected by the Contractor and resubmitted at no additional cost.

#### 1.06 INSPECTIONS AND PUNCH LIST

- A. The Electrical subcontractor shall survey and inspect his work and develop his own punch list to confirm that work is complete and finished. He shall then notify the General Contractor that work is complete and ready for inspection by the Engineer. It is not the Engineers obligation to perform a final inspection until the contractor states his work has been inspected and is complete and ready for final inspection.
- B. Request to the Engineer, or Owner for final inspection may be accompanied by a limited list of known deficiencies with a brief explanation or status of deficiencies and schedule for completion of each. Correction of these items shall be completed within (30) days of inspection or before final acceptance of occupancy.

#### 1.07 WARRANTY

- A. The Electrical subcontractor shall warrant all workmanship, equipment, and materials installed under this contract for a period of (1) year minimum from the date of final acceptance as agreed between the Contractor and the engineer, unless indicated by other sections of these specifications.
- B. Any equipment, materials, etc. proving to be defective during the warranty period shall be corrected or replaced without any expense to the Owner or other parties. This provision shall not be construed to include general maintenance items or luminaire lamps or correcting errors on the part of the owner, owner's personnel, or owner's representative.

### **PART 2 - PRODUCTS**

#### 2.01 MATERIALS AND EQUIPMENT

- A. Materials and Equipment furnished under this contract shall be in strict accordance with the specifications and drawings and shall be new and of best grade and quality. When two or more items of equal and similar materials and construction are required, they shall be of the same manufacturer.
- B. All electrical equipment and materials shall bear the Underwriters Laboratories, Inc. label, and shall comply with the NEC and NFPA requirements as applicable.

#### 2.02 MATERIALS AND EQUIPMENT SELECTION

- A. Selection of Materials and Equipment furnished under this contract shall be determined by the following:
  - 1. Where trade names, brands, and manufacturer's part numbers are listed, the exact equipment listed shall be furnished. Where more than one name is used, the contractor shall have the option of selecting between those specified. All products used shall be equal to that specified and shall be of best quality.

2. When the words “or equal” appear, specific approval must be obtained from the Engineer during the bidding period in sufficient time to be included in an addendum. The same shall apply for equipment and materials not named in the specifications, where approval is sought.
  3. Alternate materials and/or equipment must be submitted for approval a minimum 2 weeks prior to project bid date.
- B. Before bidding, when preparing shop drawings, and prior to rough-in for installation, the contractor shall verify that adequate space is available for entry and installation of the item including any accessories. Also that adequate space is available for servicing equipment and required code clearances are satisfied.

### **PART 3 - EXECUTION**

#### **3.01 GENERAL REQUIREMENTS**

- A. Advise the general contractor or engineer before starting the Work of this Division.
- B. Exposed conduits shall be painted to match the surfaces adjacent to installation. Refer to painting and coating section of specifications.
- C. Salvaged materials, if applicable, removed from buildings shall be removed from the Project site as required by the general contractor.
- D. Trenches outside of barricade limits shall be backfilled and paved within 24 hours after being inspected. Provide traffic plates during the time that trenches are open in traffic areas and in areas accessible to nonconstruction personnel.
- E. Where structural components are required to be cored for new conduit runs, separation between cored holes shall be 3 inches edge to edge, unless otherwise required by the Engineer. All coring to be laid out and reviewed by Engineer prior to drilling. Contractor to verify location of structural steel, rebar, stress cabling, or similar prior to lay out.
- F. Electrical equipment shall be braced and anchored as indicated on the Drawings.

#### **3.02 CLEANUP**

- A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

#### **3.03 PROTECTION**

- A. Protect the Work of this section until Substantial Completion.

END OF SECTION

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## SECTION 16050 - BASIC ELECTRICAL MATERIALS AND METHODS

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Provisions of Division 01 apply to this section
- B. Section Includes:
  - 1. Boxes, enclosures, keys and locks.
  - 2. Identifications and signs.
- C. Related Sections:
  - 1. Section 16010: Basic Electrical Requirements.

### PART 2 - PRODUCTS

#### 2.01 BOXES, ENCLOSURES, KEYS AND LOCKS

- A. Outlet Boxes and Fittings:
  - 1. Junction boxes installed in concealed Work shall be galvanized steel, pressed, or welded type, with knockouts.
  - 2. In exposed Work, where conduit runs change direction or size, outlet boxes and conduit fittings shall be cast metal with threaded hubs cast integral with box or fitting.
  - 3. Fittings shall be cast metal and non-corrosive. Ferrous metal fittings shall be cadmium-plated or zinc galvanized. Castings shall be true to pattern, smooth, straight, with even edges and corners, of uniform thickness of metal, and shall be free of defects.
  - 4. Covers for fittings shall be galvanized steel or non-corrosive aluminum and shall be designed for particular fitting installed.
  - 5. Junction boxes shall be minimum, 4-inch square, 2-1/8 inches deep, depending upon number of conductors or conduits therein.
  - 6. Factory made knockout seals shall be installed to seal box knockouts, which are not intact.
  - 7. Where flexible conduit is extended from flush outlet boxes, provide and install weatherproof universal box extension adapters.
- B. Junction and Pull boxes:
  - 1. Junction and pull boxes, in addition to those indicated, shall only be used in compliance with codes, recognized standards, and Contract Documents.
  - 2. Interior and non-weatherproof boxes shall be constructed of blue or galvanized steel with ample laps, spot welded, and shall be rigid under torsion and deflecting forces. Boxes shall be furnished with auxiliary angle iron framing where necessary to ensure rigidity.
  - 3. Covers shall be fastened to box with a sufficient number of brass machine screws to ensure continuous contact all around. Flush type boxes shall be drilled and tapped for cover screws if boxes are not installed plumb. Surfaces of pull and junction boxes and covers shall be labeled in black marker ink designating



system, panelboard and circuit designation contained in box. In exposed Work, designation shall be installed on inside of pull box or junction box cover.

4. Weatherproof NEMA 3R pull and junction boxes shall conform to foregoing for interior boxes with following modifications:
    - a. Cover of flush mounting boxes shall be furnished with a weather-tight gasket cemented to, and trimmed even with, cover all around.
    - b. Surface or semi-flush mounting pull and junction boxes shall be UL, or another Nationally Recognized Testing Laboratory (NRTL) listed as rain-tight and shall be furnished complete with threaded conduit hubs.
    - c. Exposed portions of boxes shall be galvanized and finished with one prime coat and one coat of baked-on gray enamel, unless already furnished with factory baked-on finish.
  5. Junction and pull boxes shall be rigidly fastened to structure and shall not depend on conduits for support.
  6. Polymer Concrete Boxes (if required):
    - a. Polymer concrete boxes are to be made from aggregates in combination with polymer resin, combined and processed by mixing, molding, and curing, and reinforced with fiberglass.
    - b. Boxes are to be high strength, impact resistant, corrosion resistant, nonflammable, and noncorrosive.
    - c. Enclosures, boxes and covers are required to conform to all test provisions of the most current ANSI/SCTE 77 "Specification For Underground Enclosure Integrity"
    - d. All components in an assembly (box & cover) are manufactured using matched surface tooling.
    - e. Covers shall be marked as electrical, power, communications, fiber, signal, etc. as required.
    - f. Bottom of box shall be filled with 6" of pea gravel.
- C. Keys and Locks:
1. Provide 2 keys with furnished door locks, including cabinet door locks and enclosure or panel locks, and 2 keys with interlocks or other furnished lock switches.

## 2.02 IDENTIFICATION AND SIGNS

### A. Identification Plates:

1. Provide identification plates for the following unless otherwise specified, for control panels, push-button stations, time switches, contactors, disconnect switches, motor starters, motor switches, terminal cabinets.
2. Identification plates shall be of plastic stock and shall adequately describe function, voltage and phase of identified equipment. Where identification plates are detailed or described on Drawings, inscription and size of letters shall be as indicated. Identification plates shall indicate panel designation, voltage, and phase of equipment. For terminal cabinets, identification plates shall indicate system contained in terminal cabinet.

3. Identification plates shall be black-and-white nameplate stock of bakelite with characters cut through black exposing white. Plates shall be furnished with beveled edges and shall be securely fastened in place with No. 4 Phillips-head, cadmium-plated steel, self-tapping screws. Characters shall be 3/16 inch high, unless otherwise indicated.
- B. Markings:
1. Install identification markings to surface-mounted starters, switches, and other devices controlling motors and appliances. Provide abbreviations required along with an identifying number. Markings to be provided with locking type stencils using paint of a contrasting color. Figures shall be 3/8 inch high unless otherwise indicated. Self-sticking plastic labels, with embossed characters made with a typewriter may be installed instead of stencils and paint; self adhesive plastic, or self sticking laminated plastic labels may be installed.

### **PART 3 - EXECUTION**

#### **3.01 INSTALLATION AND SUPPORT OF BOXES**

- A. Install boxes plumb and securely fastened to structure, independent of conduit.

#### **3.02 IDENTIFICATION OF CIRCUITS AND EQUIPMENT**

- A. Provide descriptive nameplates or tags permanently attached to circuit breakers, disconnect switches, starters, pushbutton control stations and other apparatus installed for operation or control of circuits.
- B. Provide nameplates of engraved laminated plastic, or etched metal. Submit Shop Drawings denoting dimensions and format to engineer before installation. Fasten to equipment with escutcheon pins, rivets, self-tapping screws, or machine screws. Self-adhering or adhesive backed nameplates are not permitted.
- C. Fasten tags to feeder wiring in conduits at every point where runs are broken or terminated, including pull wires in empty conduits. Indicate circuit, phase, and function. Tag branch circuits in panel boards and motor control centers. Tags may be manufactured of pressure-sensitive plastic or embossed self-attached stainless steel or brass ribbon.
- D. Provide circuit identification cards and cardholders in all control enclosures. Cardholders shall consist of metal frame retaining a clear plastic cover permanently attached to inside of panel door. List of circuits shall be typewritten on a card. Circuit description shall include name or number of circuit, area and connected load.

#### **3.03 PROTECTION**

- A. Protect Work of this section until Substantial Completion.

#### **3.04 CLEANUP**

- A. Remove rubbish, debris, and waste materials and legally dispose of off Project site.

END OF SECTION

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## SECTION 16060 - GROUNDING AND BONDING

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Provisions of Division 01 apply to this section
- B. Section Includes: Provide and install grounding system as indicated or required.
- C. Related Sections:
  - 1. Refer to related sections for their system grounding requirements.
  - 2. Section 16010: Basic Electrical Requirements.

#### 1.02 QUALITY ASSURANCE

- A. Reference Standards:
  - 1. IEEE 142 Green Book.
  - 2. Underwriter's Laboratories (UL).
  - 3. National Electrical Code.
  - 4. Building Industry Consultant Services International (BICSI) (Signal).
  - 5. EIA/TIA (Signal and power).
  - 6. Nationally Recognized Testing Laboratory (NRTL) or equal.

#### 1.03 SYSTEM DESCRIPTION

- A. Metallic objects on the Project site that enclose electrical conductors, or that are likely to be energized by electrical currents, shall be effectively grounded.
- B. Metal equipment parts, such as enclosures, raceways, and equipment grounding conductors, and earth grounding electrodes shall be solidly joined together into a continuous electrically conductive system.
- C. Metallic systems shall be effectively bonded to the main grounding electrode system.
- D. A separately derived AC source shall be grounded to the equipment grounding conductor, and to separate "made" electrode of building grounding electrode system.
- E. Electrical continuity to ground metal raceways and enclosures, isolated from equipment ground by installation of non-metallic conduit or fittings, shall be provided by a green insulated grounding conductor of required size within each raceway connected to isolated metallic raceways, or enclosures at each end. Each flexible conduit over 6 feet in length shall be provided with a green insulated grounding conductor of required size.
- F. Cold water, or other utility piping systems, shall not be utilized as grounding electrodes due to the installation of insulating couplings and non-metallic pipe in such installations.
- G. Non-current carrying metal parts of enclosures, motor frames, equipment cabinets, and metal frames of buildings shall be permanently and effectively grounded. Provide a NEC sized grounding conductor in every raceway.

- H. Neutral of service conductors shall be grounded as follows:
  - 1. Neutral shall be grounded at only one point within the Project site for that particular service. Preferable location of grounding point shall be at the service equipment or panelboard, or main switch.
  - 2. Equipment and conduit grounding conductors shall be bonded to that grounding point.

1.04 SUBMITTALS

- A. None.

**PART 2 - PRODUCTS**

2.01 MATERIALS

- A. Electrodes shall be copper-clad steel ground rods, minimum ¾-inch diameter by 10 feet long.
- B. Grounding conductors shall be copper, #12 minimum with green insulation, unless noted otherwise.
- C. Ground tails shall be copper, #12 minimum with green insulation, installed in all metallic junction boxes where devices are being installed. Branch circuit ground, junction box, and devices shall be bonded at each junction box.

**PART 3 - EXECUTION**

3.01 INSTALLATION

- A. All grounding shall be installed in accordance with details on drawings and per NEC 250.
- B. Bond all electrical boxes and enclosures.
- C. All conduits shall have a grounding conductor, minimum #12 copper. Conductor size shall be increased based on ampacity and/or phase conductors of the circuit.
- D. Install grounding conductors at each electrical location as noted on drawings.
- E. Grounding electrodes shall be installed in the nearest suitable planting area, where not otherwise indicated on Drawings.
- F. Grounding electrode conductors shall be installed in conduit from the service disconnecting means and extended to the connection point of the grounding electrode.
- G. Grounding rods shall be driven to a depth of not less than 10 feet. If necessary, permanent ground enhancement material, as manufactured by Erico Electrical Products, or equal, shall be installed at each ground rod to improve grounding effectiveness. Install in accordance with manufacture's installation instructions.
- H. Grounding electrodes shall provide a resistance to ground of not more than 25 ohms.
- I. When installing grounding rods, if resistance to ground exceeds 25 ohms, 2 or more rods connected in parallel, or coupled together shall be provided to meet grounding resistance requirements.

- J. Parallel grounding rods shall be connected together with recognized fittings and grounding conductors in galvanized rigid steel conduit, buried not less than 12 inches below finish grade.

3.02 TESTING

- A. Test grounding resistance of electrodes, ground rods, bonding of building steel, water pipes, gas pipes and other utility piping. Tests shall be performed as follows:
  - 1. Visually and mechanically examine ground system connections for completeness and adequacy.

3.03 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

3.04 CLEANUP

- A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

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## SECTION 16120 - LOW-VOLTAGE CONDUCTORS (600 VOLT AC)

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Provisions of Division 01 apply to this section
- B. Section Includes: Low-voltage wire, splices, terminations and installation.

#### 1.02 SUBMITTALS

- A. None.

### PART 2 - PRODUCTS

#### 2.01 WIRES

- A. Wires shall be single conductor type THHN or THWN insulated with polyvinyl chloride and covered with a protective sheath of nylon, rated at 600 volts. Wires may be operated at 90 degrees C. maximum continuous conductor temperature in dry locations, and 75 degrees C. in wet locations and shall be listed by UL Standard 83 for thermoplastic insulated wires, listed by Underwriter's Laboratories (UL) for installation in accordance with Article 310 of the National Electrical Code (NEC). Conductors shall be solid or stranded copper for 12 AWG and smaller conductors, and stranded copper for 10 AWG and larger conductors. Conductors shall be insulated with PVC and sheathed with nylon. Wires shall be identified by surface markings indicating manufacturer's identification, conductor size and metal, voltage rating, UL symbol, type designations and optional rating. Indentations for lettering is not permitted. Wires shall be tested in accordance with the requirements of UL standard for types THWN, or THHN.
- B. Conductors shall be solid Class B or stranded Class C, annealed uncoated copper in accordance with UL standards, or another Nationally Recognized Testing Laboratory (NRTL).

#### 2.02 STANDARDS

- A. THWN/THHN wires shall comply with the following standards:
  - 1. UL 83 for thermoplastic insulated wires.
  - 2. UL 1063 for machine tool wires and cables.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION

- A. Wires shall not be installed until debris and moisture is removed from conduits, boxes, and cabinets. Wires stored at site shall be protected from physical damage until they are installed and walls are completed.
- B. Wire-pulling compounds furnished as lubricants for installation of conductors in raceways shall be compounds approved and listed by UL, NRTL, or equal. Oil, grease, graphite, or similar substances are not permitted. Pulling of 2 AWG or larger conductors



shall be performed with a cable pull machine. Any runs shorter than 50 feet are exempt. When pulling conductors, do not exceed manufacturer's recommended values

- C. Pressure cable connectors, pre-insulated Scotchlok, 3M, or equal, Y, R or B spring-loaded twist-on type, may be furnished in splicing number 8 AWG or smaller wires for wiring systems; except public address and telephone systems.
- D. All Joints, splices, taps, and connections to neutral, bonding or grounding conductors, conductors to ground busses, and transformer connections for wires 6 gauge and larger shall be performed with high-pressure cable connectors approved for installation with copper conductors. Connectors shall be insulated with heavy wall heat shrink WCSM, or cold-applied roll-on sleeve RVS.
- E. Connections to any bussing and high-press cable connectors shall be securely bolted together with corrosion-resistant plated carbon steel, minimum grade 5 machine screws secured with constant pressure-type locking devices.
- F. Connection of any bonding or grounding conductors shall be securely bolted together with corrosion-resistant plated carbon steel, minimum grade 5 machine screws secured with constant pressure-type locking devices.
- G. Wiring in panel cabinets, pull boxes, and other cabinets, shall be neatly grouped and tied in bundles with nylon ties at 10-inch intervals. In enclosures and terminal blocks, wires shall be fanned out to terminals. If bundles are longer than 24 inches, a maximum of 9 current carrying conductors may be bundled together.
- H. Install conductor lengths with a minimum length within the wiring space. Conductors must be long enough to reach the terminal location in a manner that avoids strain on the connecting lug.
- I. Maintain the conductor required bending radius.
- J. Neutral conductors larger than 6 gauge, which are not color identified throughout their entire length, shall be taped, painted white or natural gray, or taped white where they appear in cabinet, gutters or pull boxes. Neutral conductors 6 gauge and smaller shall be white color identified throughout their entire length.
- K. Wiring systems shall be free from short circuits and grounds, other than required grounds.

### 3.02 COLOR CODES

#### A. General Wiring:

1. Color code conductor insulation as follows:

SYSTEM VOLTAGE		
Conductor	120/240V	480V
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	N/A	Yellow
Neutral	White	

2. For phase and neutral conductors 6 gauge or larger, permanent plastic-colored tape may be furnished to mark conductor end instead of coded insulation. Tape shall cover not less than 2 inches of conductor insulation within enclosure.

3.03 FEEDER IDENTIFICATION

- A. Feeder wires and cables shall be identified at each point the conduit run is broken by a cabinet, box, gutter, etc. Where terminal ends are available, identification shall be by means of heat shrink wire markers, which provide terminal strain relief. Markers shall be Brady Perma-Sleeve, or equal. Identification in other areas shall be by means of wrap-around tape markers Brady Perma-Code or equal. Markers shall include feeder designation, size, and description.

3.04 TAPE AND SPLICE KITS

- A. Splices, joints, and connectors joining conductors in dry and wet locations shall be covered with insulation equivalent to that provided on conductors. Free ends of conductors connected to energized sources shall be taped. Voids in irregular connectors shall be filled with insulating compound before taping. Thermoplastic insulating tape approved by UL, NRTL, or equal for installation as sole insulation of splices shall be furnished and shall be installed according to manufacturer's printed specifications.

3.05 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

3.06 CLEANUP

- A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

END OF SECTION

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## SECTION 16130 - RACEWAYS, FITTINGS, AND SUPPORTS

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Provisions of Division 01 apply to this section
- B. Section Includes:
  - 1. Raceways and wire ways
  - 2. Conduit installation.
  - 3. Underground requirements.
- C. Related Sections:
  - 1. Section 16010: Basic Electrical Requirements.
  - 2. Section 16050: Basic Electrical Materials and Methods
- D. Applicable Standards and Codes
  - 1. EIA/TIA 569 Standards.
  - 2. National American Standards Institute (ANSI)
  - 3. National Electrical Manufacturer's Association (NEMA)
  - 4. Nationally Recognized Testing Laboratory (NRTL)
  - 5. National Electrical Code (NEC)
  - 6. Underwriters Laboratory (UL)

#### 1.02 SUBMITTALS

- A. None.

### PART 2 - PRODUCTS

#### 2.01 RACEWAYS

- A. Conduit Materials:
  - 1. Metallic conduit, and tubing shall be manufactured under the supervision of an UL, or another NRTL factory inspection and label service program. Each 10-foot length of conduit and tubing shall bear the UL or another NRTL label and manufacturer's name.
  - 2. Rigid metallic conduit shall be rigid steel, heavy wall, mild steel, zinc-coated, with an inside and outside protective coating manufactured in accordance with ANSI C 80.1. Couplings, elbows, bends, condulets, bushings and other fittings shall be the same materials and finish as the rigid metallic conduit. Fittings, connectors, and couplings shall be threaded type, manufactured in accordance with ANSI C 80.1 and UL 6.

3. Rigid aluminum conduit shall be corrosion resistant aluminum and manufactured of 6063 alloy in temper designation T-1. It shall be manufactured in accordance with ANSI C80.5. All fittings shall be of the same materials and finish as the aluminum conduit.
  4. Flexible metallic conduit shall be of flexible interlocking strip construction with continuous zinc coating on strips, manufactured in accordance with UL 1.
    - a. Connectors and couplings shall be required fittings of the type, which threads into convolutions of flexible conduit.
    - b. Nonmetallic flexible conduit is not allowed.
  5. Liquid-tight flexible metal conduit shall be galvanized heavy wall, flexible locked metallic strip construction, UV rated, with smooth moisture and oil-proof, abrasion-resistant, extruded plastic jacket. Connectors shall be as required for installation with liquid-tight flexible conduit and shall be installed to provide a liquid-tight connection.
  6. Non-metallic conduit shall be rigid PVC electrical conduit extruded to schedule 40 dimensions of Type II. Grade 1 high impact, polyvinyl chloride, sweeps, couplings, reducers and terminating fittings shall be listed under the UL, or another NRTL, and shall bear the manufacturer's listed marking.
  7. Conduit size shall be 1/2" minimum for above grade installations and 3/4" minimum for below grade or in-slab installations.
  8. Metal Clad (MC) cable system is not allowed.
- B. Sleeves for Conduits: Sleeves shall be adjustable type, of 26 gage galvanized iron, Adjust-to-crete Co. Adjust-to-crete, or Jet Line Products Inc. Jet-Line, or equal.
- C. Where conduit enters a building through a concrete foundation below grade, or ground water level, or where it is necessary to seal around a conduit where it passes through a concrete floor or wall, provide O-Z/Gedney Type FSK Thru Wall and Floor Seal, or equal.
- D. Wireways shall be 16 gage galvanized steel enclosed hinge/screw wiring troughs, surface metal raceway, wireway, and auxiliary gutter designed to enclose electrical wiring. Wireway fittings shall be furnished with removable covers and sides to permit complete installation of conductors throughout the entire wireway run. Cover shall be furnished with keyhole slots to accept captive screws locking the cover securely closed. Wireways shall be UL or another NRTL listed, and shall be Square D Type LDG NEMA-1 enclosure for interior applications, or Type RD NEMA-3R enclosure for exterior applications, or equal by Cooper B-line, Hoffman, Wire Guard, or Circle AW.
- E. Pull Wires: Install 1/8 inch polypropylene cords in empty or spare conduits.

## **PART 3 - EXECUTION**

### **3.01 CONDUIT INSTALLATION**

- A. General Requirements:

1. Provide complete and continuous systems of rigid metallic conduit, outlet boxes, junction boxes, fittings and cabinets for systems of electrical wiring including lighting, power, and signal systems, except as otherwise specified.
2. EMT conduit is not allowed for this project.
3. Flexible metallic conduit shall be installed for final connection of motor terminal boxes, shop equipment, mechanical equipment, and other equipment, or for frequent interchange, and shall be of sufficient length, not exceeding 36 inches, to permit full travel or adjustment of motor on its base. Flexible metallic conduit shall not be used for equipment not requiring adjustment or frequent interchange.
4. Liquid-tight flexible metallic conduit shall be installed at exterior locations or where subject to liquid or oil exposure, except where otherwise specified, for final connection of equipment and as listed above.
5. Connectors for flexible metal conduit and liquid-tight flexible metallic conduit shall be compatible with the conduit, and of the types which threads into convolutions of conduit. Connectors for watertight flexible metal conduit shall be as required for installation and shall be installed to provide a watertight connection.
6. Exposed conduit shall be installed vertically and horizontally following the general configuration of the structure.
7. Underground feeder distribution conduits for systems may be non-metallic conduit instead of rigid conduit except where otherwise specified or indicated.
8. Conduit shall be concealed unless otherwise indicated. Conduits exposed to view shall be installed parallel or at right angles to structural members.
9. Bends or offsets will not be permitted unless absolutely necessary. Radius of each conduit bend or offset shall be as required by ordinance. Bends and offsets shall be performed with standard industry tools and equipment or may be factory fabricated bends or elbows complying with requirements for radius of bend specified. Heating of metallic conduit to facilitate bending is not permitted. Refer to underground installation, specified in this section, for radius of bends and offsets required for underground installations.
10. Running threads are not permitted. Provide conduit unions where union joints are necessary. Conduit shall be maintained at least 6 inches from covering of hot water and steam pipes and 18 inches from flues and breechings. Open ends of conduits shall be sealed with permitted conduit seals during construction of buildings and during installation of underground systems.
11. Where conduits are terminated in groups at panelboards, switchboards, and cabinets, etc., provide templates or spacers to fasten conduits in proper position and to preserve alignment.
12. Conduits shall be supported as required by code, but not to exceed 10 feet. Where applicable, conduit needs to be rigidly supported every 5 feet and supported within 3 feet of every junction box.
13. Where auxiliary supports, saddles, brackets, etc., are required to meet special conditions, they shall be fastened rigid and secure before conduit is attached.

14. Pipe hangers for individual conduits shall be factory fabricated. Steel rods shall be 3/8 inch for 2-inch conduit hangers and smaller and shall be 1/2 inch for 2-1/2 inch conduit hangers and larger.
15. Factory fabricated pipe straps shall be one or 2-hole formed galvanized clamps, heavy-duty type, except where otherwise specified.
16. One inch and smaller exposed conduits shall be fastened with one-hole malleable iron straps. Perforated straps and plumber's tape is not permitted for the support of conduits. Do not fasten or support conduits with "tie-wire".
17. Bushings and locknuts for rigid steel conduit shall be steel threaded insulating type. Setscrew bushings are not permitted.
18. Flex conduits shall be cut square and not at an angle.
19. Routing of conduits may be changed providing length of any conduit run is not increased more than 10 percent of the length indicated on Drawings.

B. Underground Requirements:

1. Underground conduits and raceways shall be buried to a depth of not less than 24 inches below finished grade to top of the conduit envelope, unless otherwise specified.
2. Assemble sections of conduit with required fittings. Cut ends of conduit shall be reamed to remove rough edges. Joints in conduits shall be provided liquid-tight. Bends at risers shall be completely below surface where possible.
3. The architect or engineer will observe underground installations before and during conduit placement. A mandrel shall be drawn through each run of conduit in presence of the architect or engineer before and after placement. Mandrel shall be 6 inches in length minimum, and have a diameter that is within 1/4 inches of diameter of conduit to be tested.
4. Non-metallic conduit installations shall comply with following additional requirements. Joints in PVC conduit shall be sealed by means of required solvent-weld cement supplied by conduit manufacturer. Non-metallic conduit bends and deflections shall comply with requirements of applicable electrical code, except that minimum radius of any bend or offset for conduits sized from 1/2 inch to 1-1/2 inches inclusive shall not be less than 24 inches. Bends at risers and risers shall be galvanized, rigid steel conduit. Conduits below slab shall be painted with epoxy, resin paint.
5. All below grade non-metallic conduits shall have galvanized, rigid steel 90's painted epoxy, resin paint.
6. Furnish and install a 6-inch wide, polyethylene, red underground barrier type 12 inches above full length of conduits reading, "CAUTION ELECTRIC LINE BURIED BELOW".
7. Underground conduit systems provided for utility companies shall be furnished to meet the requirements of the utility companies requiring service.
8. Protect inside of conduit and raceway from dirt and rubbish during construction by capping openings.

9. Add bell-end bushings for conduit stub-up including underground entries to pull boxes, and manholes. Under floor standing switchboards and motor control centers provide a 4" galvanized nipple with ground bushing.
10. Underground conduit for systems operating above 600 volts shall be a minimum size of 4 inches.
11. All underground conduits and raceways shall be swabbed prior to wire pull.

3.02 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

3.03 CLEANUP

- A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

END OF SECTION



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## SECTION 16140 - WIRING DEVICES

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Provisions of Division 01 apply to this section
- B. Section Includes:
  - 1. Receptacles
  - 2. Switches
  - 3. Coverplates
- C. Related Sections:
  - 1. Section 16010: Basic Electrical Requirements.
  - 2. Section 16050: Basic Electrical Materials and Methods

#### 1.02 SUBMITTALS

- A. Provide in accordance with Division 01.
- B. Shop Drawings:
  - a. Include manufacturer's cut sheets for each type device being installed listing description, manufacturer, and part number.
  - b. Include manufacturer's cut sheets for each device coverplate being installed listing description, manufacturer, and part number.
- C. Installation Instructions: Submit manufacturer's written installation instructions including any warning labels and instruction manuals.

#### 1.03 QUALITY ASSURANCE

- A. Receptacles shall comply with NEMA WD 1, NEMA WD 6, and UL 498.
- B. Switches shall comply with NEMA WD 1 and UL 20.

### PART 2 - PRODUCTS

#### 2.01 RECEPTACLES AND SWITCHES

- A. Receptacles:
  - 1. Color: Coordinate with architect
  - 2. Duplex receptacles shall be heavy-duty specification grade, grounding type. Terminal screws shall be back and side wired with internal screw pressure plates. Mounting strap shall feature heavy-duty brass construction. Receptacle back body shall be PVC. Receptacle face shall be impact resistant nylon. Receptacles shall have triple wipe brass power contacts.

<u>NEMA #</u>	<u>Pass &amp; Seymour</u>	<u>Hubbell</u>	<u>Leviton</u>
NEMA 5-20	PS5362	HBL5362	5362

3. Provide specification grade ground-fault circuit interrupter (GFCI) type receptacles in accordance with UL standards. GFCI receptacles shall have a trip indication light. Receptacle terminal screws shall be back and side wire with internal screw pressure plates. Test and reset buttons shall match device body in color. GFCI receptacles shall be manufactured in standard configuration for installation with stainless steel smooth plates. Exterior mounted receptacles shall be mounted inside weatherproof enclosure.

<u>NEMA #</u>	<u>Pass &amp; Seymour</u>	<u>Hubbell</u>	<u>Leviton</u>
(20 amps) NEMA 5-20R	2094	GFR5352	8898

4. Provide weatherproof receptacles, except where otherwise indicated or specified, consisting of GFCI receptacles, as specified herein, and metal plates with die-cast hinged, "in-use" covers and weatherproof mats.

B. Switches:

1. Color: Coordinate with architect

2. Local Switches:

- a. Provide local switches, high strength thermoplastic toggle, specification grade, rated 20 amps at 120-277 volts AC only, with plaster ears, external screw pressure plate back and side wired, and standard size composition cups which fully enclose mechanism. Switches shall be approved for installation at currents up to full rating on resistive, inductive, tungsten filament lamp and fluorescent lamp loads, and for up to 80 percent of rating for motor loads. Switches shall have oversized silver alloy contacts for long life and better heat dissipation. Provide switches as single pole, double pole, 3-way, 4-way, non-lock type.

	<u>Pass &amp; Seymour</u>	<u>Hubbell</u>	<u>Leviton</u>
Single pole	PS20AC1	HBL1221	1221-2
Double pole	PS20AC2	HBL1222	1222-2

### PART 3 - EXECUTION

#### 3.01 INSTALLATION OF DEVICES

- A. Installation shall be in accordance with the NEC and as shown as on the drawings.
- B. Ground terminal of each receptacle shall be bonded to the outlet box with an approved green bonding jumper and also connected to the green equipment grounding conductor.
- C. Ensure that devices and their boxes are protected until completion of project.
- D. Keep outlet boxes free of plaster, mortar, cement, paint, dust, or other materials that may contaminate the devices, conduits, wiring, cables, etc.
- E. Do not install wiring devices until all preparation, painting, finishing, is complete.
- F. Do not strip insulation from wiring until devices are being installed.
- G. Replace any devices that have been damaged or show signs of use during construction phase of project before finishes were complete.
- H. Keep devices in their package or protected until time of installation.

- I. Connect devices using pigtail connections of not less than 6". Where conductors larger than #12 AWG have been installed, use #12 AWG for pigtail connections to devices.
  - J. Remove fiber or plastic washers prior to installation to ensure metal-to-metal contact.
  - K. Test wiring devices for damaged conductors, high circuit resistance, poor connections, inadequate fault current path, defective devices, or similar problems using a portable receptacle tester. Correct circuit conditions, remove malfunctioning units and replace with new, and retest as specified above.
  - L. Test GFCI devices for tripping values specified in UL 1436 and UL 943.
- 3.02 COVER PLATES
- A. Provide weatherproof, in-use covers as noted on drawings and as required for use.
- 3.03 PROTECTION
- A. Protect Work of this section until Substantial Completion.
- 3.04 CLEANUP
- A. Remove rubbish, debris, and waste materials and legally dispose of off Project site.

END OF SECTION

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## SECTION 16440 - DISCONNECTS

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Provisions of Division 01 apply to this section
- B. Section Includes: Safety Switches / Disconnects.
- C. Related Sections:
  - 1. Section 16050: Basic Electrical Materials and Methods.

#### 1.02 SUBMITTALS

- A. Provide in accordance with Division 01.
- B. Shop Drawings: Include dimensions, make, capacity of equipment, size, rating, and catalog number. Vendor cut sheets of devices in enclosure and bill of materials listing description, manufacturer, part number, and quantity of items shall be included.
- C. Installation Instructions: Submit manufacturer's written installation instructions.

#### 1.03 DESIGN REQUIREMENTS

- A. Disconnect Switches:
  - 1. In accordance with UL 98, NEMA KS1, and NEC.
  - 2. Shall be service entrance rated with grounding lug kit.
  - 3. Fusible Switch, 600 amp and smaller: NEMA KS 1, Type HD, with clips or bolt pads to accommodate specified fuses or recommended fuses, lockable handle; interlocked with cover in closed position.
  - 4. Non-Fusible Switch, 600 amp and smaller: NEMA KS 1, Type HD, lockable handle; interlocked with cover in closed position.
  - 5. Shall have the following features:
    - a. Switch mechanism shall be the quick-make, quick-break type.
    - b. Copper blades, visible in the OFF position.
    - c. An arc chute for each pole.
    - d. External operating handle shall indicate ON and OFF position and have lock-open padlocking provisions.
    - e. Mechanical interlock shall permit opening of the door only when the switch is in the OFF position, defeatable to permit inspection.
    - f. Fuse holders for the sizes and types of fuses specified.
    - g. Electrically operated switches shall only be installed where shown on the drawings.
    - h. Solid neutral for each switch being installed in a circuit which includes a neutral conductor.
    - i. Ground lugs for each ground conductor.
    - j. Enclosures:
      - i. Shall be the NEMA types shown on the drawings for the switches.

- ii. Where the types of switch enclosures are not shown, they shall be the NEMA types most suitable for the ambient environmental conditions. Unless otherwise indicated on the plans, all outdoor switches shall be NEMA 4X stainless steel.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Disconnect switches shall be manufactured by General Electric, Eaton, Square D, Siemens, or equal.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

- A. Disconnects/Safety switches shall be installed in the vertical position with "ON" at the up position and top of the switch and securely fastened to structural members.
- B. Unused openings in cabinets and disconnects shall be effectively closed as required by the manufacturer.
- C. Cabinets shall be grounded as specified in Article 250 of the National Electrical Code.
- D. Conduits shall be installed so as to prevent moisture or water from entering and accumulating within the enclosure.
- E. Lugs shall be suitable and listed for installation with the conductor being connected.
- F. Conductor lengths shall be maintained to a minimum within the wiring gutter space. Conductors shall be long enough to reach terminal location in a manner that avoids strain on the lugs. Maintain required bending radius of conductors inside cabinet.
- G. Clean the cabinet of foreign material such as cement, plaster, and paint.
- H. Distribute and arrange conductors neatly in the wiring gutters.
- I. Use the manufacturer's torque values to tighten lugs.
- J. Before energizing disconnect switches, the following steps shall be taken:
  - 1. Retighten connections to the manufacturer's torque specifications. Verify that required connections have been provided.
  - 2. Remove shipping blocks from component devices and interiors.
  - 3. Remove debris from switch interior.
- K. Follow manufacturer's instructions for installation.

### **3.02 PROTECTION**

- A. Protect the Work of this section until Substantial Completion.

### **3.03 CLEANUP**

- A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

## SECTION 16445 - PANELBOARDS

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Provisions of Division 01 apply to this section
- B. Section Includes: Lighting and power distribution facilities, including panelboards.
- C. Related Sections:
  - 1. Section 16010: Basic Electrical Requirements.
  - 2. Section 16050: Basic Electrical Materials and Methods.
  - 3. Section 16550: Lighting.

#### 1.02 SUBMITTALS

- A. Provide in accordance with Division 01.
- B. Shop Drawings: Include a front elevation indicating cabinet dimensions, make, location and capacity of equipment, size of gutters, type of mounting, finish, and catalog number. General layout of internal devices, wiring drawings with wire numbers and device connections, vendor cut sheets of devices in enclosure and bill of materials listing description, manufacturer, part number, and quantity of items shall be included.
- C. Installation Instructions: Submit manufacturer's written installation instructions.

#### 1.03 DESIGN REQUIREMENTS

- A. Panelboards:
  - 1. Panelboards shall be wall-mounted, enclosed safety type with 480 volt, 3-phase 3-wire or 120/208 volt, 3-phase, 4-wire or 120/240 volt, 1-phase, 3-wire solid neutral mains as indicated on Drawings or specified. First panelboard shall be provided with main circuit breakers where indicated.
  - 2. Single pole branches shall be molded case, thermal magnetic circuit breakers with inverse time delay, trip free, quick-make, quick-break mechanism and silver alloy contacts. Circuit breakers shall be fully rated, with ampere rating marked on handle and shall indicate on/off and tripped positions. Ground fault interrupters shall be incorporated into circuit breakers where indicated. They shall be listed by UL, or other NRTL as ground fault devices. Provide appropriate lug kit of sufficient size to accommodate the feeders.
  - 3. Two-pole and 3-pole branches shall be enclosed, and shall be thermal magnetic circuit breakers with inverse time delay, tamper-proof, ambient compensated, single handle, internal common trip, and quick-make, quick-break mechanism with silver alloy contacts. Circuit breakers shall be fully rated or as otherwise indicated on the Drawings.
  - 4. Main and subfeeder circuit breakers shall be enclosed, thermal magnetic type with inverse time delay, single handle common trip, quick-make, quick-break mechanism, corrosion-resistant bearings and silver alloy contacts. Ampere frame size and trip rating shall be as indicated on Drawings. Voltage rating shall be as indicated on Drawings. Branch mounted mains are not acceptable.



5. Circuit breakers shall be fully rated and of one-piece, bolt-on type and shall meet short-circuit interrupting capacity requirements indicated on Drawings.
  6. Internal connections shall be fabricated with plated copper bus bars and the busses shall extend for full length of space available for branch circuit breakers. Feeder cable connectors shall be installed at point of feeder entrance. Terminals shall be furnished with copper conductors. Panelboards fed by conductors having over-current protection greater than 200 amperes shall be protected on supply side by over-current devices having a rating not greater than that of panelboards. Copper bussing shall be fully rated. Heat rated bussing is not acceptable
  7. Except where otherwise indicated, circuit breakers shall be in 2 vertical rows connected to bus bars in a distributed phase arrangement. Two-pole branches shall be balanced on busses. Single pole branches shall be numbered adjacent to its circuit breaker, with odd numbers on left and even numbers on right.
  8. Specified circuit breaker spaces shall be furnished with hardware required for future installation of circuit breakers.
  9. Provide locking devices for individual circuit breakers. Padlocking devices shall be secured to circuit breakers and by panel dead front plates.
- B. Surge Suppressors: Where indicated on Drawings, provide transient voltage surge suppressors as separately installed of panelboards. Panelboards shall be complete with 200 percent rated copper neutral bus, ground bus and isolated ground bus in addition to requirements of this section. Surge suppressors shall be as follows:
1. Surge Capacity:
    - a. Service Entrance SPDs shall be ANSI/UL listed type 1 SPD with a 160 KA surge rating per mode, with field replaceable surge modules.
    - b. Distribution or Branch panels shall be UL listed type 1 SPD with a 80 KA surge rating per mode.
  2. UL 1449 3<sup>rd</sup> Edition Suppressed Voltage Rating:

Voltage Configuration	L-N	N-G	L-G	L-L
120/240V	800V	700V	900V	1200V
120/208V	800V	700V	900V	1200V
240V			1200V	1200V
277/480V	1200V	1200V	1200V	2000V
480V			2000V	2000V

3. EMI/RFI High-Frequency Noise Power Filter (Characteristics):
  - a. 100 KHz at 44 dB.
  - b. 100 MHz at 44 dB.
  - c. 10 MHz at 44 dB.
  - d. 100 MHz at 444 dB.

4. MOVs shall be thermally protected for low current faults and shall be fused with surge-rated fuses. The surge-rated surge current passes and clears the circuit safely if the surge capacity is exceeded. Enhanced diagnostics shall continuously monitor the unit's status and shall include LEDs to signal a reduction in surge capacity or the loss of a suppression circuit. An audible alarm, with test and silence features, shall be furnished in diagnostic package.
5. Each phase or the entire unit shall be replaceable and have bolted-on, tin-plated copper connections. Unit to have UL witnessed fault current rating of 65,000 symmetrical amperes.
6. Surge suppression units shall comply with the following:
  - a. UL certified.
  - b. UL 1283 5<sup>th</sup> Edition.
  - c. UL 1449 3<sup>rd</sup> Edition.
  - d. IEEE C 62.45.
  - e. IEEE C 62.41.
  - f. Nationally Recognized Testing Laboratory (NRTL) or equal

C. Panelboard Cabinets:

1. Panelboard cabinets shall be code gage galvanized steel or blue steel; fronts, doors, and trims shall be code gage furniture steel. Cabinets shall be furnished with at least 6-inch high gutters at top and bottom where feeder cable size exceeds 4 gage or where feeder cable passes through cabinet vertically. Cabinets shall be furnished with top and bottom gutters sized as required by inspection department having jurisdiction, but never less than 6 inches where more than one feeder enters top or bottom of cabinets. Side gutters shall not be less than 4 inches wide. Width of cabinets shall be 20 inches, unless otherwise indicated on Drawings.
2. Doors shall be cut true, shall accurately fit opening and finish smooth across joints. Hinges shall be entirely concealed except for barrels and pins. Hinge flanges shall be welded to door and trim.
3. Outdoor cabinets shall be NEMA Type 3R or 4X type 316 Stainless Steel where noted. Construction shall be formed from code gage galvanized steel with ANSI No. 61 gray enamel finish. Provide heavy-duty, 3-point latching, vault type door handles with padlocking provisions. Provide stainless steel or galvanized butt hinges on doors.
4. Self-tapping screws and bolts not permitted.

D. Panelboard Schedule: Provide a neatly typewritten schedule with number or name of room or area, or load served by each panelboard circuit. Room numbers or names shall be determined at the Project site and shall not necessarily be those indicated on the Drawings. Schedule shall also indicate panel designation, voltage and phase, building and distribution panel or switchboard from which it is fed. Schedule shall be installed in a frame under transparent plastic on inside of each panelboard door.

- E. Panelboard Standards: Panelboards shall be UL, or other NRTL listed and labeled. Panelboards shall meet latest revisions of following standards:
1. National Electric Code, Article 408.
  2. UL 67, Panelboards.
  3. UL 50, Cabinets and Boxes.
  4. UL 943, GFCI.
  5. UL 489, Molded Case Circuit Breakers.
  6. NEMA PB1.
  7. Federal Specifications W-P- 115C and WC-375B.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Equipment shall be manufactured by General Electric, Cutler Hammer, Square D, Siemens, or equal.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

- A. Equipment shall be located so it is readily accessible and not exposed to physical damage.
- B. Equipment installed outdoors shall be specifically listed for wet locations and shall be weatherproof in NEMA 4X, type 316 Stainless Steel cabinets.
- C. Equipment locations shall provide sufficient working space around panels to comply with the National Electrical Code.
- D. Panelboards shall be securely fastened to structure and mounted on surface by at least 4 points.
- E. Unused openings in cabinets and disconnects shall be effectively closed as required by the manufacturer.
- F. Cabinets shall be grounded as specified in Article 250 of the National Electrical Code.
- G. Conduits shall be installed so as to prevent moisture or water from entering and accumulating within the enclosure.
- H. Lugs shall be suitable and listed for installation with the conductor being connected.
- I. Conductor lengths shall be maintained to a minimum within the wiring gutter space. Conductors shall be long enough to reach the terminal location in a manner that avoids strain on the connecting lugs.
- J. Maintain the required bending radius of conductors inside the cabinet.
- K. Clean the cabinet of foreign material such as cement, plaster, and paint. Repaint to manufacturers original finish any blemishes that occur during construction.
- L. Distribute and arrange conductors neatly in the wiring gutters.
- M. Use the manufacturer's torque values to tighten lugs.

- N. Before energizing panelboards, the following steps shall be taken:
  - 1. Retighten connections to the manufacturer's torque specifications. Verify that required connections have been provided.
  - 2. Remove shipping blocks and debris from component devices and panelboard interiors.
  - 3. Manually exercise circuit breakers to verify they operate freely.
- O. Follow manufacturer's instructions for installation.
- P. Do not install in highly corrosive environments, unless rated for the application.

3.02 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

3.03 CLEANUP

- A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

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## SECTION 16550 - LIGHTING

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Provisions of the General and Supplementary Conditions and Division 01 apply to this section.
- B. Section Includes: Furnishing and installing lighting fixtures, including lamps, ballasts/drivers, wiring, and lighting controls.
- C. Light fixtures model numbers were determined at the time this specification was written; model numbers may need to be modified, or may require the addition or deletion of options to fully meet specification requirements.
- D. Related Sections:
  - 1. Section 16010: Basic Electrical Requirements
  - 2. Section 16050: Basic Electrical Materials and Methods.

#### 1.02 SUBMITTALS

- A. Provide in accordance with Division 01.
- B. List of Materials: Submit a complete list of materials proposed for this section.
- C. Shop Drawings: Provide detailed and dimensioned Shop Drawings or manufacturer's data sheet with specific model and part numbers indicating kind, weight and thickness of materials, method of fitting and fastening parts together, location and number of sockets, size of lamps, and complete details of method of fitting suspension and fastening fixtures in place.
- D. Submittals must comply with contract general provisions.

#### 1.03 MOUNTING REQUIREMENTS

- A. Design of lighting fixtures, accessories, supports, and method of fixture installation shall comply with requirements of ceiling type which fixture is installed.
- B. Provide suspension points at no more than 2 feet from fixture ends. Spacing between supports shall not exceed 8 feet.
- C. Site lighting fixtures shall be pole mounted where noted on drawings.

#### 1.04 QUALITY ASSURANCE

- A. Components and fixtures shall be listed and approved for the intended application by Underwriter's Laboratories (UL), or other Nationally Recognized Testing Laboratory (NRTL).
- B. Owners approval shall be obtained for any equipment or materials substitutions.

#### 1.05 GUARANTEE

- A. Provide a 1 year labor warranty.
- B. Provide material warranty as specified:

1. Lamps: 1 years
  2. Ballasts/Drivers: 5 years
  3. Standards: 1 years
- C. Warranty period begins at substantial completion or project acceptance for beneficial occupancy.

## PART 2 - PRODUCTS

### 2.01 MATERIAL AND FABRICATION

- A. Lighting fixtures shall be the type indicated on Drawings and as specified. Fixtures of same type shall be of one manufacturer.
- B. Fixtures shall be of the types and manufacturers described in the Luminaire Schedule of the Drawings, with lamps, wattage and voltage as indicated. Alternate fixtures must be submitted for approval minimum 2 weeks prior to project bid date.
- C. All fixtures shall be baked-on enamel or powder-coated, unless otherwise specified in subsections below.

### 2.02 LAMPS AND BALLASTS/DRIVERS

#### A. LED Fixtures, Driver, and Characteristics

1. LED Fixture
  - a. Cast aluminum heat sink integrated directly with housing.
  - b. Replaceable PC board with quick connects.
  - c. High lumen output LED's with 50,000 hours life expectancy.
  - d. No lead or mercury.
2. Optics System
  - a. Computer-optimized internal reflector with specular finish with diffusing lens to conceal the LED's for uniform luminance.
  - b. Low glare, lumens as noted on drawings.
3. LED Driver
  - a. Non-dimming and/or optical 0-10V dimming driver accommodating 120 or 277 volts AC at 60 Hz.
  - b. Power factor 0.9 minimum.
  - c. Driver to accept 120 or 277 volts AC.

### 2.03 POLES

#### A. Area poles:

1. Fabricated from high grade, structural material.
2. Shaft supplied with hand hole and cover.
3. Base fabricated from structural quality, material, circumferentially welded to shaft

4. Base cover shall be 2-piece, heavy wall construction and shall entirely conceal the anchor base.
5. Anchorage shall be by 3/4" fully galvanized anchor bolts, each supplied with (2) nuts and (2) washers. Anchor bolt lengths shall be as recommended by manufacturer, minimum 30".
6. Polyester powder coat finish.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Install a lighting fixture for each lighting outlet indicated and mark new ballasts/drivers with day of installation.
- B. Fixture voltage shall be as indicated on Drawings.
- C. Install fixture rigidly supported to structural frame members.
- D. Align rows of fixtures to form straight lines at uniform elevations.
- E. Where emergency battery packs are installed, provide constant hot for emergency fixtures. Unless noted otherwise, when powering unit inverter power packs, use the same circuit that powers the switched ballast/driver to power the inverter.
- F. Where emergency ballast(s)/driver(s) are specified within the fixture, provide constant hot for the ballast(s)/driver(s). Nonemergency ballasts/drivers within the same fixture shall be switched as indicated, unless noted otherwise.
- G. Surface mount fixtures shall be attached to structure. Toggle bolts are NOT permitted. Provide backing where required.
- H. Pole mounted fixtures shall be installed on concrete base foundation. Unless noted otherwise, base shall be 24" diameter with 36" above grade, 72" below grade. Vertical rebar shall be #4 and #3 tie rings shall be spaced at 12" OC. Concrete shall be 3000PSI, rubbed smooth finish.

### 3.02 TESTING

- A. Check and adjust fixtures for required illumination.
- B. Replace defective lamps and ballasts/drivers.
- C. Test and adjust lighting control equipment for proper operation.

### 3.03 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

### 3.04 CLEANUP

- A. Remove rubbish, debris, and waste materials from all areas of work each day.
- B. Clean fixture surfaces of dirt, cement, plaster and debris. Furnish cleansers compatible with material surfaces being cleaned.



3.05 HAZARDOUS WASTE DISPOSAL

- A. All hazardous waste disposal shall be handled and disposed of by an approved, licensed contractor.
- B. Any and all ballasts are assumed to contain PCB unless clearly marked "NO PCB."
- C. Place ballasts and lamps in appropriate containers provided by hazardous waste contractor labeled clearly with:
  - 1. Project Name
  - 2. Quantity of lamps
  - 3. Date lamps became waste
- D. Store, remove, transport and dispose of hazardous materials in all accordance with state and federal regulations.
- E. Provide Owner with copy of manifest and certificate of destruction.

END OF SECTION

# APPENDIX



October 19, 2022

St. Tammany Parish Government  
Department of Utilities  
620 N. Tyler Street  
Covington, Louisiana 70433  
Phone: (985) 893-1717

Attn: Mr. Andrew Hontiveros, P.E.

Re: Geotechnical Engineering Report  
Proposed New Water Towers  
Slidell, Louisiana  
SE Project No. G22-092

Dear Andrew:

Stratum Engineering, LLC (SE) is pleased to submit our Geotechnical Engineering Report for the above referenced project. The report includes the field data and laboratory test results, as well as foundation recommendations and soil parameters to be used in the design.

We appreciate the opportunity to perform this geotechnical study and look forward to working with you during the design and construction phases of this project. If you have any questions pertaining to this report, or if we may be of further service, please do not hesitate to call.

Respectfully submitted,  
STRATUM ENGINEERING, LLC

William "Dean" McInnis, P.E.  
Sr. Project Manager

WDM/TYM

Tony Y. Maroun, P.E.  
Principal



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## **PROJECT INFORMATION**

### **Project Authorization**

Stratum Engineering, LLC (SE) has completed a geotechnical exploration for the proposed new Water Towers to be constructed at two (2) sites in Slidell, Louisiana. The exploration was accomplished in general accordance with SE Proposal No. G22-150, dated August 8, 2022.

### **Project Description**

We understand that the St. Tammany Parish Department of Utilities is planning to install two (2) new elevated water tanks, one at the St. Tammany Levee Board site and one at the Willow Wood WWTP site to supplement the existing Cross Gates Water System.

While the exact site layouts and equipment setups have not been determined, the Department of Utilities is working with other regulatory agencies and an independent engineering consultant to evaluate the capacity and flow requirements of the new tanks. Based on the limited information available to date, we understand that consideration is being given to installing elevated tanks with maximum storage capacities ranging from 400,000 gallons to 1.0 million gallons. In order to maintain an adequate discharge pressure of at least 75 psi, the tanks will need to be elevated to a sufficient height to maintain at least 175 feet of water. The maximum height of the tanks is understood to be 190 feet.

Based on conversations with Andre Monnot with Principal Engineering, the independent engineering consultant for the project, we understand that the unfactored working single pile loads are assumed to be between 160 and 220 kips.

A new water well will also be installed at the Levee Board site which will have a minimum pumping capacity of 1,200 gallons per minute. In addition, both sites will include equipment slabs for lightly loaded ancillary structures such as control panels, generators and chlorine buildings.

The geotechnical recommendations presented in this report are based on the available project information, water tower locations, and the subsurface materials described in this report. If any of the noted information is incorrect, please inform SE in writing so that we may amend the recommendations presented in this report, if appropriate and if desired by the client. SE will not be responsible for the implementation of its recommendations when it is not notified of changes in the project.

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## **Purpose and Scope of Services**

The purpose of this study was to explore the subsurface conditions at the site to provide the design team foundation recommendations and soil parameters necessary for the design of suitable foundation systems for the proposed new Water Towers. The scope of services included drilling eight (8) borings to a depth of 100 feet, 6 at the Levee Board site and 2 at the Willow Wood site. In addition, one (1) boring was advanced to a depth of 40 feet at each site. The borings were located in the field by a Stratum Engineering representative in coordination with the Department of Utilities using geospatial coordinates and a handheld GPS unit. The approximate boring locations are indicated on the boring location plans included in the Appendix.

Our scope of services included a reconnaissance of the project site, drilling the soil borings, select laboratory testing, and preparation of this geotechnical report. The report briefly outlines the testing procedures, presents available project information, describes the site and subsurface conditions, and provides recommendations regarding the following:

- Foundation types, allowable pile capacities, allowable bearing capacities, and estimates of settlement;
- Seismic site classification;
- Site preparation, including subgrade preparation and fill compaction requirements;
- Factors influencing construction and performance of the proposed construction.

The scope of geotechnical services did not include an environmental assessment for determining the presence or absence of wetlands, or hazardous or toxic materials in the soil, surface water, groundwater, or air on or below, or around this site. Any statements in this report or on the boring logs regarding odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes.

## **SITE AND SUBSURFACE CONDITIONS**

### **Site Locations**

The current plans include construction of a new water towers at the Levee Board site located at 61134 Military Road and the Willow Wood WWTP facility situated at 200 Cross Gates Boulevard in Slidell.

The site off Military Road is currently occupied by the former Levee Board Building which is situated at the south end of the roughly 3.4 acre parcel. A small covered shed is located in the northeast corner of the site, but the remainder of the property is undeveloped and covered with short surface vegetation. Topographic information provided to us indicate that existing surface elevations range from a low of approximately +9.4 feet at the center of the eastern property line and up to +15 to +20 feet along the north, south and west boundaries.

The Willow Wood facility is much smaller and only occupies around 0.7 acres. The facility consists of a WWTP and small shed located behind a wooden privacy fence in a mostly residential area with homes and businesses on all sides. A gravel access drive extends into the property and encircles the treatment plant. The remainder of the site is covered with grass. The property is relatively flat with surface elevations between +10.5 and +12.0 feet.

### **Drilling, Sampling, and Laboratory Testing Procedures**

The borings were drilled with an All-Terrain Vehicle (ATV) mounted drill rig. Auger and wet rotary drilling techniques were used to advance the borings. Samples were generally obtained continuously from the ground surface to a depth of ten feet and at maximum five foot intervals thereafter. Drilling and sampling techniques were accomplished in general accordance with ASTM Standards.

Undisturbed samples of cohesive soils were generally obtained using thin-wall tube sampling procedures in general accordance with the procedures for “Thin-Walled Tube Geotechnical Sampling of Soils” (ASTM D1587). These samples were extruded in the field with a hydraulic ram and were wrapped in aluminum foil prior to placement in a plastic wrapping to preserve moisture. The samples were transported to the laboratory in containers to prevent disturbance.

For cohesionless soils and semi-cohesive soils, Standard Penetration Tests (SPT) were performed to obtain standard penetration values of the soil. The standard penetration value (N) is defined as the number of blows of a 140 pound hammer, falling 30 inches, required to advance the split-barrel sampler one (1) foot into the soil. Samples of granular soils were obtained utilizing a two (2) inch O.D. split-barrel sampler in general accordance with procedures for “Penetration Test and Split-Barrel Sampling of Soils” (ASTM D1586). To perform the test and obtain a sample, the sampler is lowered to the bottom of the previously cleaned drill hole and advanced by blows from the hammer. The number of blows is recorded for each of three (3) successive increments of six (6) inches penetration. The “N” value is obtained by adding the second and third incremental numbers. The results of the standard penetration test indicate the relative density of cohesionless soils and thereby provide a basis for estimating the relative strength and compressibility of the soil profile components. The split spoon samples were identified according to the project number, boring number and depth, and were also placed in polyethylene plastic wrapping to protect against moisture loss.

The laboratory testing program included supplementary visual classification and water content tests on all of the soil samples. In addition, selected samples were subjected to unconfined compression testing, percent passing the #200 sieve and Atterberg Limits determination. Additional estimates of unconfined compressive strength and undrained shear strength were made using a hand penetrometer and a torvane, respectively. The laboratory testing was performed in general accordance with ASTM Standard Procedures.

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## **Subsurface Conditions**

Based on the borings drilled at the Levee Board site, approximately 10 inches of silty or sandy topsoil with organics covered the surface. The surficial material was generally underlain by stiff to very stiff sandy clays or lean and fat clays with sand to a depth between 8 and 17 feet. Layers of medium to very dense silty and poorly graded sands followed the near surface clays to a depth of 72 to 87 feet. Below this depth, alternating layers of firm to stiff sandy clays and dense to very dense clayey or poorly graded sands were found extending to a depth of at least 100 feet, the maximum depth explored. It should be noted that a 5 to 10 foot thick layer of firm to stiff sandy clay or lean clay with sand was noted around 40 feet in borings B-2 and B-5.

In contrast, 10 to 12 inches of silty topsoil with organics covered the surface at the Willow Wood site and was followed by firm to very stiff silty clay to a depth of 4 to 6 feet. The moisture sensitive surface material was underlain by stiff to very stiff lean and fat clay to around 27 feet where a layer of loose to medium dense silty or clayey sand was found and extended to a depth of 37 to 42 feet. The shallow sand was followed by firm to stiff lean and fat clays to around 52 to 57 feet where a thicker medium to very dense sand layer was noted to between 77 and 92 feet. The deep borings were terminated in firm to stiff fat clay or sandy fat clay at a depth of 100 feet. In addition, a thin layer of organic clay was noted in borings B-9 and B-10 at depths of 25 and 40 feet, respectively.

The above subsurface description is of a generalized nature to highlight the major subsurface stratification features and material characteristics. The boring logs included in the Appendix should be reviewed for specific information at the boring locations. The records include soil descriptions, stratification, penetration resistances, and locations of the samples and laboratory test data. The stratification shown on the boring logs represents the conditions only at the actual boring locations. Variations may occur, and should be expected between locations. The stratification represents the approximate boundary between subsurface materials and the actual transition may be gradual. Water level information obtained during field operations is also shown on the boring logs. The samples, which were not altered by laboratory testing, will be retained for 60 days from the date of this report and then will be discarded.

## **Groundwater Conditions**

Groundwater was initially encountered between 8 and 16 feet at the Military site and between 10 and 13 feet at the Willow Wood site. Delayed measurements taken at the completion of drilling were around 3 to 9 feet and 8 ½ to 11 feet for the Military and Willow Wood sites, respectively. However, it should be noted that groundwater levels will fluctuate with seasonal variations in rainfall, extended periods of drought and surface runoff. Therefore, it is recommended that the actual groundwater level at the site be determined by the contractor at the time of the construction activities.



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## **IBC Site Classification**

*The International Building Code (IBC), 2012 edition*, was reviewed to determine the site classification for seismic design. Based on the soils encountered in the borings and our experience in the general vicinity, the site can be classified as Site Class “D”, as outlined in Section 1613.3.2 of the Building Code.

## **EVALUATION AND RECOMMENDATIONS**

### **General**

The type and depth of foundation suitable for a given structure primarily depends on several factors including the subsurface conditions, the function of the structure, the loads it may carry, the cost of the foundation and the criteria set by the Design Engineer with respect to vertical and differential movement which the structure can withstand without damage.

Due to the high magnitude of the structural loads associated with the elevated water towers, we understand that consideration is being given to various deep foundation systems for support of the structures. As requested, SE has evaluated treated timber and pre-cast concrete piles as well as open end steel pipe piles and steel H-piles installed to various depths. Details related to foundation design, as well as site preparation and development, are presented in subsequent sections of this report.

### **Site Preparation**

Site preparation is expected to include, but not be limited to, removal of any existing structures as well as stripping and removing any topsoil with organics or other deleterious materials from the development areas. Utility lines at both sites should be located and re-routed as necessary. The actual stripping or undercutting depth should be determined by a representative of the Geotechnical Engineer at the time of construction.

The subgrade in the non-pile supported areas should be proofrolled with a tandem axle or similar heavily loaded vehicle weighing about 20 tons. Soils, which are observed to rut or deflect excessively under the moving load, should be undercut and replaced with properly compacted structural fill. The proofrolling and undercutting activities should be witnessed by a representative of the Geotechnical Engineer and should be performed during a period of dry weather.

After subgrade preparation and observation have been completed, the initial layer of fill should be placed in a relatively uniform horizontal lift and be adequately keyed into the stripped and scarified subgrade soils. The structural fill should consist of sandy clays or clayey sands having a maximum liquid limit of 40 percent and a maximum plasticity index of 20.

The fill should be placed in maximum lifts of eight (8) inches of loose materials and should be compacted within one (1) percentage point below and three (3) percentage points above the optimum moisture content. If water must be added, it should be uniformly applied and thoroughly mixed into the soil by disking or scarifying. The fill should be compacted to at least 95 percent of the Standard Proctor maximum dry density as determined by ASTM D698. Adequate drainage should be provided prior to and during site work. The site should be graded to promote rapid runoff.

## **Foundation Recommendations**

### **Deep Foundations**

#### **Driven Piles**

Based on the field data and laboratory test results, deep foundation systems were evaluated for support of the proposed elevated water towers at both sites. Due to the magnitude of the structural loads anticipated for the towers, we understand that the design engineer will likely use either square pre-cast concrete piles, steel pipe piles or steel H-piles for support of the structures. Therefore, SE has evaluated appropriate sizes of each pile type for consideration. While treated timber piles will likely not provide sufficient capacity for support of the towers, we have also analyzed small and large treated timber piles for any moderately loaded ancillary structures or equipment.

As previously discussed, medium to very dense sand layers were encountered throughout the explored depth at both sites, but the sand layer at the Military (Levee Board) site was noted as shallow as 15 feet and persisted to at least 75 feet. The sand at the Willow Wood location was limited to between 25 to 40 feet and 55 to 75 feet. Consequently, the piles at both sites will generally derive their support through “skin friction” along their embedded lengths along with some “end bearing” capacity when tipped in the dense sand layer.

The recommended pile lengths are from the existing ground surface at the time of drilling. However, a pile cutoff length of about five (5) feet was considered in the design to accommodate the pile caps. Since the stratigraphy did vary between the sites, site specific pile capacities have been provided based on the soil conditions encountered at each location. The recommended pile lengths and the estimated corresponding allowable capacities are presented in the following tables:

### Military Road Site

ESTIMATED ALLOWABLE SINGLE PILE LOAD CAPACITY, TONS*				
F.S. = 2.0 IN COMPRESSION				
F.S. = 3.0 IN TENSION				
Pile Length in Feet**	Small Treated Timber Pile (6" Tip – 8" Butt)		Large Treated Timber Pile (7" Tip – 12" Butt)	
	Compression	Tension	Compression	Tension
20	8+	6	13	9
25	--	--	18	12
30	--	--	24	16
35	--	--	25+	19

\* Capacities are soil-pile related capacities and consideration should be given to the structural integrity of the pile number.

\*\* Pile lengths measured from the existing ground surface at the time of drilling.

ESTIMATED ALLOWABLE SINGLE PILE LOAD CAPACITY, TONS*						
F.S. = 2.0 IN COMPRESSION						
F.S. = 3.0 IN TENSION						
Pile Depth Feet**	14" Square Pre-Cast Concrete Pile		16" Square Pre-Cast Concrete Pile		18" Square Pre-Cast Concrete Pile	
	Compression	Tension	Compression	Tension	Compression	Tension
40	78	35	82	38	87	41
45	86	41	92	45	97	48
50	96	47	103	52	109	56
55	106	54	114	60	122	64
60	116	60	125	67	134	73
65	125	67	136	74	147	81

\* Capacities are soil-pile related capacities and consideration should be given to the structural integrity of the pile number.

\*\* Pile lengths measured from the existing ground surface at the time of drilling.

ESTIMATED ALLOWABLE SINGLE PILE LOAD CAPACITY, TONS*				
F.S. = 2.0 IN COMPRESSION				
F.S. = 3.0 IN TENSION				
Pile Length in Feet**	HP14x73 Steel H-Pile		18" Diameter Open-End Steel Pipe Pile	
	Compression	Tension	Compression	Tension
70	74	34	80	37
75	78	36	86	39
80	84	39	91	42
85	90	43	97	46
90	95	46	103	49
95	102	51	110	54

\* Capacities are soil-pile related capacities and consideration should be given to the structural integrity of the pile number.

\*\* Pile lengths measured from the existing ground surface at the time of drilling.

### Willow Wood Site

ESTIMATED ALLOWABLE SINGLE PILE LOAD CAPACITY, TONS*				
F.S. = 2.0 IN COMPRESSION				
F.S. = 3.0 IN TENSION				
Pile Length in Feet**	Small Treated Timber Pile (6" Tip – 8" Butt)		Large Treated Timber Pile (7" Tip – 12" Butt)	
	Compression	Tension	Compression	Tension
35	8+	6	17	11
40	--	--	19	13
45	--	--	22	15
50	--	--	25+	17

\* Capacities are soil-pile related capacities and consideration should be given to the structural integrity of the pile number.

\*\* Pile lengths measured from the existing ground surface at the time of drilling.

ESTIMATED ALLOWABLE SINGLE PILE LOAD CAPACITY, TONS*						
F.S. = 2.0 IN COMPRESSION						
F.S. = 3.0 IN TENSION						
Pile Depth Feet**	14" Square Pre-Cast Concrete Pile		16" Square Pre-Cast Concrete Pile		18" Square Pre-Cast Concrete Pile	
	Compression	Tension	Compression	Tension	Compression	Tension
60	85	40	93	45	101	50
65	92	47	102	53	110	58
70	102	54	115	60	125	65

\* Capacities are soil-pile related capacities and consideration should be given to the structural integrity of the pile number.

\*\* Pile lengths measured from the existing ground surface at the time of drilling.

ESTIMATED ALLOWABLE SINGLE PILE LOAD CAPACITY, TONS*				
F.S. = 2.0 IN COMPRESSION				
F.S. = 3.0 IN TENSION				
Pile Length in Feet**	HP14x73 Steel H-Pile		18" Diameter Open-End Steel Pipe Pile	
	Compression	Tension	Compression	Tension
60	77	46	80	47
65	82	48	85	49
70	87	50	91	51
75	92	51	96	53

\* Capacities are soil-pile related capacities and consideration should be given to the structural integrity of the pile number.

\*\* Pile lengths measured from the existing ground surface at the time of drilling.

The allowable capacities presented in the above tables include a factor of safety of 2 in compression and 3 in tension which are typically used when the pile capacities are verified in the field by a static load test.

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## Pile Settlement

It is estimated that long term settlement of piles, driven to the recommended depth and loaded to their allowable capacities, will be on the order of one (1) inch. Differential settlement is anticipated to be on the order of 50 percent of the total settlement.

## Spacing and Group Effect

A group of piles subjected to vertical loads may not necessarily have the same capacity as the sum of the capacities of the individual piles. For axially loaded piles, published results indicate that the ratio of capacity per pile in a group to that of a single isolated pile typically ranges from 0.5 to 1.0. This efficiency factor depends on the spacing or distance between each pile. In planning groups of driven piles, a minimum center-to-center spacing of 3D (where D is the pile diameter) is recommended to avoid the reduction in capacity and maximize the pile group efficiency.

Group effect should be minimal for piles in clusters of up to 9 piles spaced at a minimum of 3 pile diameters. For larger pile clusters, group effect could become a factor and should be evaluated in accordance with the local building code.

## Pile Installation

Pile driving hammers used to drive foundation piles should be selected according to pile type, length, size and weight of pile, as well as potential vibrations resulting from pile driving operations. Care should be taken to assure that the hammer selected is capable of achieving the desired penetration without causing damage to the piles or causing excessive vibrations which could damage existing, nearby structures.

Hammers having a rated energy in the range of 30,000 to 40,000 foot-pounds per blow are recommended for the pre-cast concrete, steel pipe and steel H-piles. For small timber piles hammers having a rated energy in the range of 7,000 to 10,000 foot-pounds per blow should be used while hammers with a rated energy of 15,000 to 20,000 foot-pounds are recommended for the large timber piles. Each pile should be driven to the desired tip elevation and the driving resistance should be monitored without interruption in the driving operations.

Since relatively dense sand was encountered at shallow depths, pre-drilling will be necessary to advance the piles to the required tip elevation without compromising their integrity and causing excessive vibrations. Pre-drilling should be performed with a “fish-tail” bit no larger than 75 percent of the pile diameter and should extend no deeper than about 15 feet from the pile tip elevation.

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Driving of the center piles in the cluster first will better facilitate the driving operations. Accurate records of the final tip elevation and driving resistances should be obtained during the pile driving operations. Some pile heaving may be experienced during installation of adjacent displacement type piles. It is therefore recommended that the tip elevation of the piles be recorded and if significant heave is noted after driving of subsequent piles, provisions must be made for reseating them.

### Pile Driving Monitoring

We recommend that the pile driving be monitored by the Geotechnical Engineer or his representative. Sometimes, premature refusal occurs due to poor performance of the hammer rather than from soil resistance. Any changes in hammer blow counts should be carefully examined before making any decisions about the pile penetration.

### Vibration Monitoring

Thresholds of vibration induced cracking are generally site specific and depend on the type and age of the structure, the frequency of ground vibration, and the type of soil supporting the structure. Research by the U.S. Bureau of Mines (USBM) and other investigative groups have established criteria relating the occurrence of structural damage to certain frequencies and level of ground motion. According to the USBM, within the range of four (4) to 12 hertz, the maximum particle velocity recommended to preclude the threshold damage to plaster-on-wood old structures is 0.5 inch per second (ips).

Peak particle velocities of 0.25 ips are perceived to be uncomfortable to humans. Furthermore, peak particle velocities in excess of 0.25 ips could densify near surface cohesionless soils resulting in cosmetic cracks in structures supported on these soils. Therefore, if sustained peak particle velocities exceed 0.25 ips, the construction activities causing these vibration levels should be halted and the construction procedures altered to maintain a safe level of vibration and minimize potential damage to adjacent structures.

Although the threshold of 0.25 ips is adopted by the local engineering community, it is presented as a guide for consideration by the design engineer. The determination of site specific vibration thresholds involves a more detailed study of the structure in question as well as an evaluation of typical pre-construction background vibration levels in the area. As such, a lower threshold may be necessary should construction take place near historic structures. These services are beyond the scope of this study, and if desired, should be completed by others prior to commencement of construction activities.

Furthermore, a pre-construction survey of nearby structures as well as development of base line of vibration induced by normal daily activities in the area is highly recommended prior to construction. This could allow for a fair settlement of third party property damage claims. While Stratum Engineering is providing this general information as a guide, SE does not assume responsibility for the impact of construction vibrations on nearby structures.

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### Pile Load Test

It is recommended that the pile capacity at each site be verified by a field load test. At least three (3) probe piles should be driven in the pile cap footprint of each water tower to the design tip elevation using the same equipment and technique proposed for the job piles. The pile at each location which exhibits the least resistance to driving should be load tested in compression as outlined by ASTM D1143. The pile load tests should be performed under the guidance of the Geotechnical Engineer so that the data may be interpreted and the recommended pile capacities adjusted, if necessary, according to the load test results.

### Dynamic Pile Testing

If a static load test is not implemented to verify the pile capacity in the field, the capacity of the piles for the water towers should be verified by dynamic pile testing using a Pile Driving Analyzer (PDA) in accordance with ASTM D4945. A PDA can monitor the driving stresses during pile installation and monitor the energy transferred to the pile by the hammer to evaluate the pile installation efficiency. Furthermore, it may be used to re-strike the pile to verify the capacity after a setup period of 7 to 14 days. Data from the dynamic pile testing can be further evaluated by CAPWAP analyses and the capacity adjusted according to the test results. A factor of safety of 2.5 should be applied to the ultimate compression capacity obtained with the PDA.

### Lateral Load Analysis

For deep foundations, the lateral loads are resisted by the soil as well as the rigidity of the pile. Analyses can be performed by methods ranging from chart solutions to finite difference methods. Lateral load analysis is typically performed to limit the amount of deflection or determine a maximum yield moment resistance of the piles once the loading and configuration have been finalized for the structure.

Since the design for the water towers is still being finalized, lateral loading was not analyzed by Stratum Engineering at this stage of the project. SE may be retained to perform lateral load analyses on the selected pile configuration, if needed, once the finalized loads and configurations are available for both sites. Should the lateral loads be analyzed by others, the following tables provide soil parameters for both locations which are typically needed to utilize lateral load analysis software, such as LPILE:

### Military Road Site

AVERAGE SOIL PARAMETERS							
Depth (ft.)	'p-y' Criteria	Effective Unit Weight, $\gamma'$ (pcf)	$S_u$ (ksf)	$\phi$ (deg.)	k (pci)	$\epsilon_{50}$ %	Dr %
0 – 6	Stiff Clay	130	1.34	--	341	0.84	--
6 – 17	Very Stiff Clay	70	2.48	--	798	0.58	--
17 – 82	Dense Sand	63	--	39	121	--	75
82 – 92	Firm Clay	60	0.78	--	145	1.17	-
92 – 97	Stiff Clay	67	1.31	--	336	0.85	--
97 – 100	Medium Sand	60	--	38	90	--	64

Note:  $S_u$  – Undrained shear strength (psf);  $\phi$  – Angle of internal friction; k – Limiting Modulus of Subgrade Reaction (pci) for static loading condition;  $\epsilon_{50}$  – Strain corresponding to one-half the principle stress; Dr – Relative density.

### Willow Wood Site

AVERAGE SOIL PARAMETERS							
Depth (ft.)	'p-y' Criteria	Effective Unit Weight, $\gamma'$ (pcf)	$S_u$ (ksf)	$\phi$ (deg.)	k (pci)	$\epsilon_{50}$ %	Dr %
0 – 6	Firm Clay	124	0.84	--	162	1.12	--
6 – 10	Very Stiff Clay	70	2.11	--	646	0.64	--
10 – 20	Stiff Clay	69	1.75	--	505	0.71	--
20 – 25	Firm Clay	56	0.59	--	83	1.38	--
25 – 40	Medium Sand	56	--	35	46	--	43
40 – 55	Firm Clay	64	0.95	--	205	1.03	--
55 – 75	Dense Sand	63	--	39	122	--	75
75 – 100	Stiff Clay	68	1.43	--	379	0.81	--

Note:  $S_u$  – Undrained shear strength (psf);  $\phi$  – Angle of internal friction; k – Limiting Modulus of Subgrade Reaction (pci) for static loading condition;  $\epsilon_{50}$  – Strain corresponding to one-half the principle stress; Dr – Relative density.

## Shallow Foundations

### Shallow Footings

Lightly loaded ancillary structures may be supported on shallow foundations. Spread footings and continuous footings, bearing at least two (2) feet below the finished grade on the stiff clay or on compacted structural fill, could be designed for maximum allowable bearing pressures of 2,500 psf and 2,000 psf, respectively, based on dead loads and design live loads. The recommended allowable bearing capacities include a factor of safety of 3.

Minimum dimensions of twenty-four (24) inches for column footings and eighteen (18) inches for continuous footings should be used in foundation design to minimize the possibility of a localized bearing failure. The above bearing capacities include a design factor of safety of 3.



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The uplift resistance of shallow spread footings formed in open excavations should be limited to the weight of the foundation concrete and the soil above it. For preliminary design purposes, the uplift resistance can be computed by using a total unit weight of 115 pcf for the structural fill placed and compacted above the footing, and a unit weight of 150 pcf for the concrete. Concrete reinforcing steel should be properly sized to resist uplift forces. We recommend that a factor of safety of at least 1.5 be used when determining the allowable uplift resistance of spread footings.

Soil resistance to horizontal forces is developed by lateral earth pressures acting on the face of the footing and by friction or adhesion on the footing base. We recommend that the allowable passive pressure be computed for spread footings below grade using the following equation:

$$P_p = 2000 + 120H \text{ (Clay)}$$

where  $P_p$  is the lateral soil resistance in psf (pounds per square foot) and  $H$  is the depth in feet. For exterior footings,  $H$  is measured from one (1) foot below adjacent finished grade, provided that the adjacent finished grade extends level and at least beyond a point that makes a 45-degree angle from the bottom of the exterior footing to the finished ground surface.

The top foot of passive resistance at foundations should be neglected unless the ground surface around the footing is covered by concrete or pavement. The resistance to sliding of spread footings bearing in structural fill can be computed by multiplying the footing base contact area by a sliding friction factor of 0.38. Spread footings should also be sized to resist overturning due to moment forces.

The foundation excavations should be observed by a representative of SE prior to steel or concrete placement to assess that the foundation materials are capable of supporting the design loads and are consistent with the materials discussed in this report. Soft or loose soil zones encountered at the bottom of the footing excavations should be removed to the level of firm soils or adequately compacted fill as directed by the Geotechnical Engineer. Cavities formed as a result of excavation of soft or loose soil zones should be backfilled with compacted structural fill or graded crushed stone, as determined by the Geotechnical Engineer.

The concrete should be placed in the footing excavations as quickly as possible to avoid exposure of the footing bottoms to wetting and drying. Surface run-off water should be drained away from the excavations and not be allowed to pond prior to or after concrete placement. The foundation concrete should be placed during the same day the excavation is made. If it is required that footing excavations be left open for more than one day, they should be protected to reduce evaporation or entry of moisture.

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### Shallow Foundation Settlement

Settlement of a spread footing designed for the recommended bearing pressure is estimated to be less than one (1) inch. Differential settlements could be 50 percent of the total settlement.

## **CONSTRUCTION CONSIDERATIONS**

It is recommended that SE be retained to provide observation and testing of construction activities involved in the foundations and related activities of this project. SE cannot accept any responsibility for any conditions which deviate from those described in this report, nor for the performance of the foundations, if not engaged to also provide construction observation and testing for this project.

### **Moisture Sensitive Soils/Weather Related Concerns**

The upper soils encountered at this site are extremely sensitive to disturbances caused by construction traffic and changes in moisture content. During wet weather periods, an increase in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. In addition, soils that become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather.

### **Drainage and Groundwater Concerns**

Water should not be allowed to collect in the foundation excavations or on the prepared subgrade in the construction area either during or after construction. Undercut or excavated areas should be sloped toward one corner to facilitate removal of any collected rainwater, groundwater, or surface runoff. Positive site surface drainage should be provided to reduce infiltration of surface water around the foundations.

Groundwater was measured around 3 to 9 feet at the Military site and 8 ½ to 11 feet at the Willow Wood site upon completion of the drilling operations. However, it is possible that seasonal variations will cause fluctuations of the water table. Additionally, perched water may be encountered in discontinuous zones within the overburden soils. Any water accumulation should be removed from the excavations by pumping. If excessive and uncontrolled amounts of seepage occur, the Geotechnical Engineer should be consulted to provide additional recommendations, if necessary.

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## **Excavations**

In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its “Construction Standards for Excavations, 29 CFR, Part 1926, Subpart P”. This document was issued to better ensure the safety of workmen entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, basement excavation or footing excavation, be constructed in accordance with the new OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor’s “responsible person”, as defined in 29 CFR, Part 1926, should evaluate the soil exposed in the excavations as part of the contractor’s safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

We are providing this information solely as a service to our client. Stratum Engineering does not assume responsibility for construction site safety or the contractor’s or other parties’ compliance with local, state, and federal safety or other regulations.

## **REPORT LIMITATIONS**

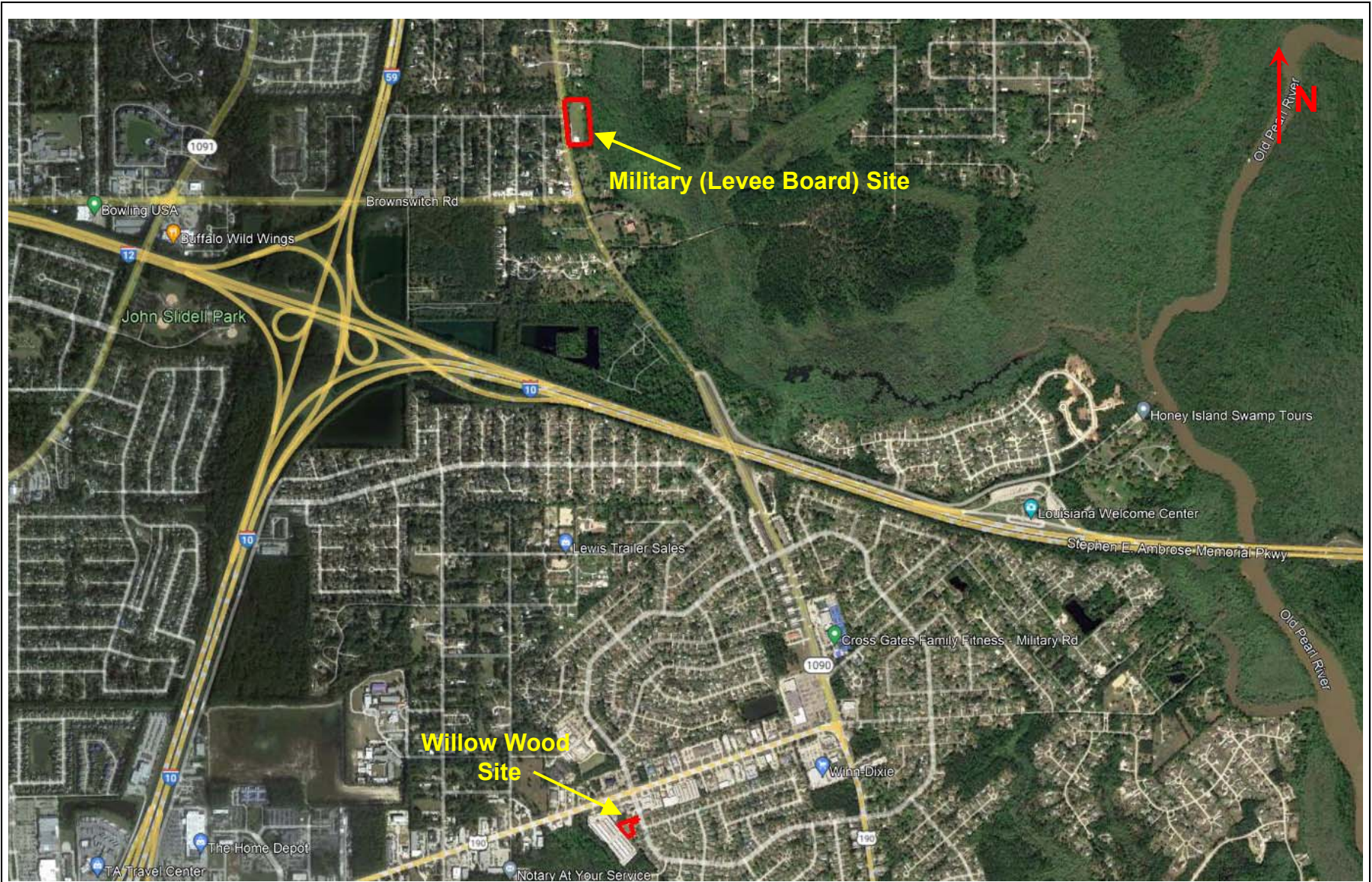
The recommendations submitted in this report are based on the available subsurface information obtained by SE and design details furnished by the St. Tammany Parish Government and Principal Engineering, Inc. If there are any revisions to the plans for this project, or if deviations from the subsurface conditions noted in this report are encountered during construction, SE should be notified immediately to determine if changes in the foundation recommendations are required. If SE is not notified of such changes, SE will not be responsible for the impact of those changes on the project.

The Geotechnical Engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

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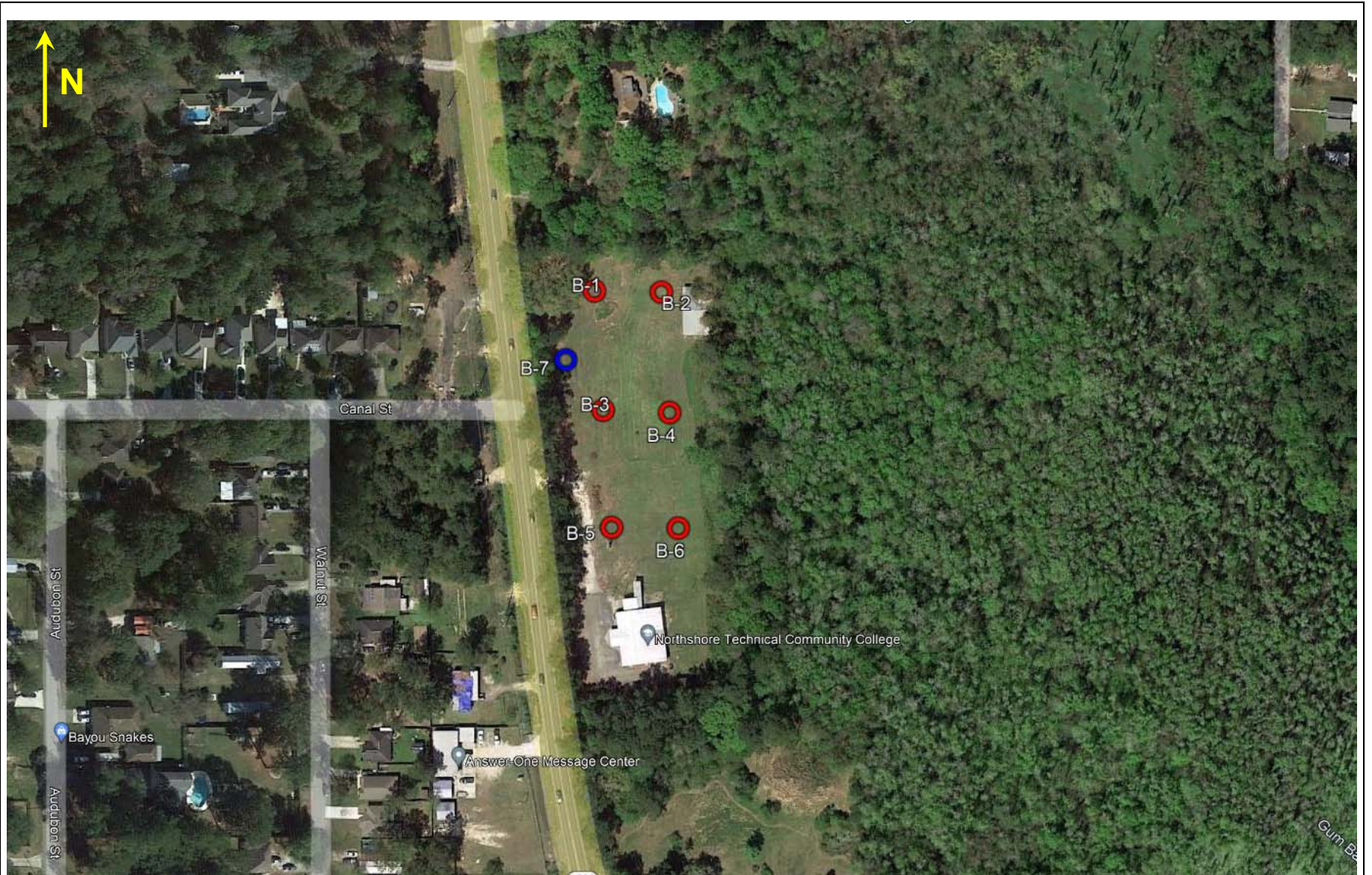
After the plans and specifications are more complete, the Geotechnical Engineer should be retained and provided the opportunity to review the final design plans and specifications to check that our engineering recommendations have been properly incorporated in to the design documents. At that time, it may be necessary to submit supplementary recommendations. If SE is not retained to perform these functions, SE will not be responsible for the impact of those conditions on the project. This report has been prepared for the exclusive use of the St. Tammany Parish Government for the specific application to the proposed New Water Towers to be constructed in Slidell, Louisiana.

APPENDIX



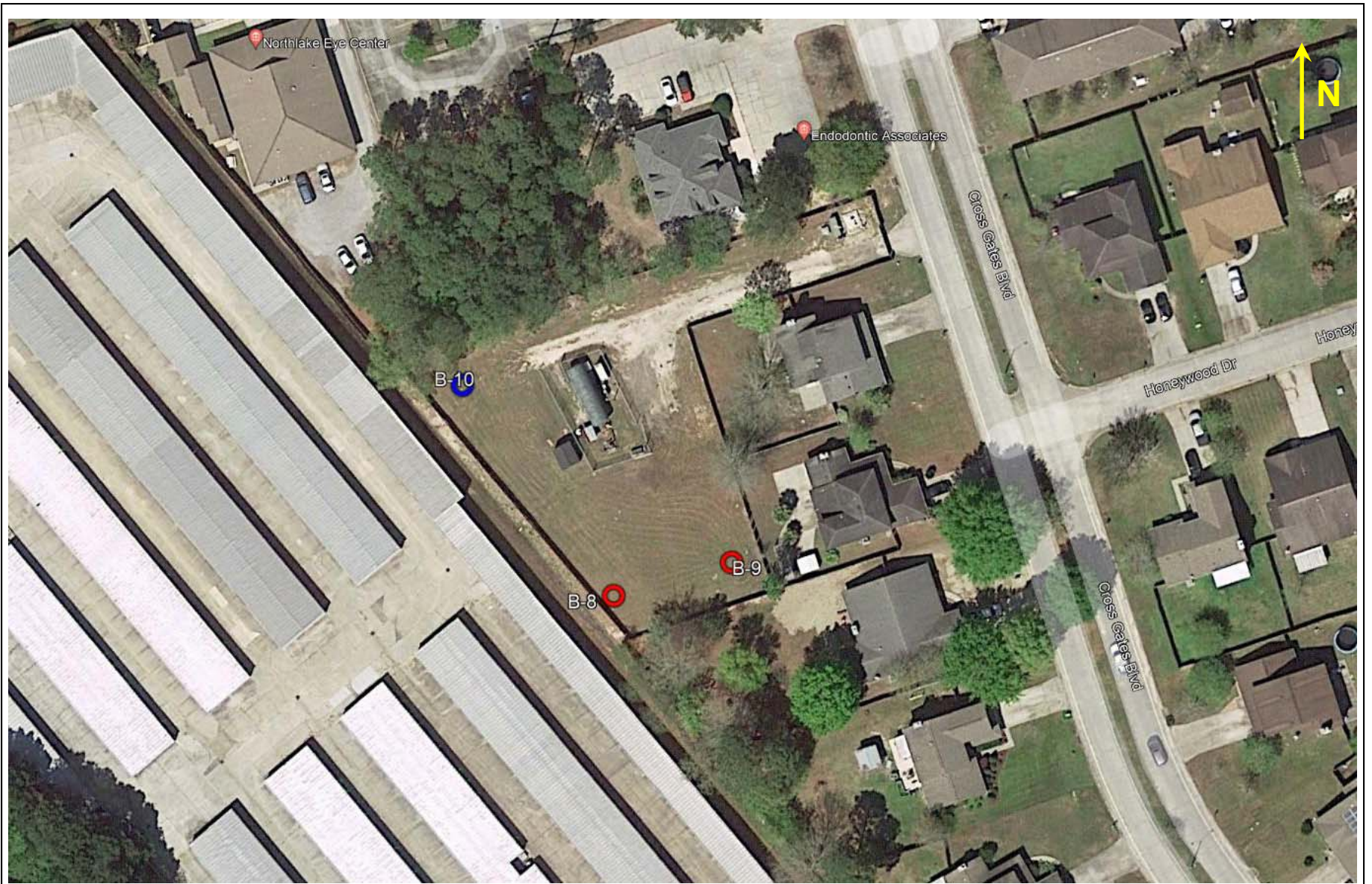
**SITE VICINITY MAP**  
SE PROJECT NO. G22-092

GEOTECHNICAL ENGINEERING SERVICES  
PROPOSED NEW WATER TOWERS  
SLIDELL, LOUISIANA



**BORING LOCATION PLAN**  
**MILITARY (LEVEE BOARD) SITE**  
 SE PROJECT NO. G22-092

GEOTECHNICAL ENGINEERING SERVICES  
**PROPOSED NEW WATER TOWERS**  
 SLIDELL, LOUISIANA



**BORING LOCATION PLAN**  
WILLOW WOOD SITE  
SE PROJECT NO. G22-092

GEOTECHNICAL ENGINEERING SERVICES  
PROPOSED NEW WATER TOWERS  
SLIDELL, LOUISIANA





## LOG OF BORING B-1

### PROPOSED NEW WATER TOWERS SLIDELL, LOUISIANA

TYPE OF BORING: WET ROTARY

LOCATION: LEVEE BOARD SITE

PROJECT NO.: G22-092

DEPTH, FT.	SOIL TYPE	SAMPLES	DESCRIPTION	N-BLOWS/FT.	UNCONFINED COMPRESSIVE STRENGTH tsf	HAND PENETROMETER tsf	TORVANE tsf	UNIT DRY WEIGHT pcf	MOISTURE CONTENT %	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200 SIEVE	
0	Brown	X	10" Silty Topsoil with organics			0.75			19				
1			Firm tannish gray Lean Clay with sand		1.10	3.00		109	16	38	20		
2			- becomes stiff to very stiff reddish tan at 2'			3.25							
5						2.71	4.50		111	18			
10	Brown	X	Stiff to very stiff reddish gray Fat Clay with sand			1.75			19				
15						3.89	4.00		108	18	58	40	85
20	Yellow	X	Medium dense tannish gray Silty Sand	21					20			13	
25			- becomes very dense at 23'	50+						20			
30	Yellow	X	Very dense tannish gray Poorly Graded Sand	50+					17			9	
35				50+						16			
40	Yellow	X	Very dense reddish tan Poorly Graded Sand with gravel	50+					16			22	
45										25			
50	Yellow	X	Very dense reddish tan Poorly Graded Sand	50+					30			5	

DEPTH OF BORING: 100 Feet  
DATE: 8/28/2022

GROUNDWATER: Measured at 9 Feet Upon Completion of Drilling



**LOG OF BORING B-1 (continued)**  
**PROPOSED NEW WATER TOWERS**  
**SLIDELL, LOUISIANA**

TYPE OF BORING: WET ROTARY

LOCATION: LEVEE BOARD SITE

PROJECT NO.: G22-092

DEPTH, FT.	SOIL TYPE	SAMPLES	DESCRIPTION	N-BLOWS/FT.	UNCONFINED COMPRESSIVE STRENGTH tsf	HAND PENETROMETER tsf	TORVANE tsf	UNIT DRY WEIGHT pcf	MOISTURE CONTENT %	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200 SIEVE	
55	Very dense reddish tan Poorly Graded Sand	X	- becomes loose to medium dense tannish gray at 53'	26					37				
60			10						29			12	
65			50+	- very dense at 63'						23			
70			11							24			2
75			26							23			
80	Firm gray Sandy Lean Clay	X		4					29	46	31	69	
85	Medium dense tannish gray Silty Sand	X		11					26				
90			13						29				
95	Firm to stiff dark gray Fat Clay with sand lenses	X				1.00			46				
100						1.25			35				

DEPTH OF BORING: 100 Feet  
 DATE: 8/28/2022



**LOG OF BORING B-2**  
**PROPOSED NEW WATER TOWERS**  
**SLIDELL, LOUISIANA**

TYPE OF BORING: WET ROTARY

LOCATION: LEVEE BOARD SITE

PROJECT NO.: G22-092

DEPTH, FT.	SOIL TYPE	SAMPLES	DESCRIPTION	N-BLOWS/FT.	UNCONFINED COMPRESSIVE STRENGTH tsf	HAND PENETROMETER tsf	TORVANE tsf	UNIT DRY WEIGHT pcf	MOISTURE CONTENT %	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200 SIEVE
			10" Sandy Topsoil with organics			0.50			19			
			Loose gray Clayey Sand									
			Firm to stiff reddish tan Lean Clay with sand		0.93	1.00		108	21	45	27	85
5			Very stiff reddish tan Fat Clay	▼		2.50			22			
			- reddish gray at 6'	▼	2.60	3.00		104	22			
10						3.75			20			
			Medium dense to dense reddish tan Silty Sand									
15				36					24			18
20				20					21			
			Medium dense to dense tannish gray Poorly Graded Sand									
25				31					20			9
30				16					26			
35			- with gravel at 33'	16					25			13
40				32					25			
45			- becomes very dense at 43'	50+					22			3
50				50+					25			

DEPTH OF BORING: 100 Feet  
 DATE: 8/25/2022

GROUNDWATER: Measured at 5 Feet Upon Completion of Drilling



**LOG OF BORING B-2 (continued)**  
**PROPOSED NEW WATER TOWERS**  
**SLIDELL, LOUISIANA**

TYPE OF BORING: WET ROTARY

LOCATION: LEVEE BOARD SITE

PROJECT NO.: G22-092

DEPTH, FT.	SOIL TYPE	SAMPLES	DESCRIPTION	N-BLOWS/FT.	UNCONFINED COMPRESSIVE STRENGTH tsf	HAND PENETROMETER tsf	TORVANE tsf	UNIT DRY WEIGHT pcf	MOISTURE CONTENT %	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200 SIEVE
			Very dense tannish gray Poorly Graded Sand									
55		⊗	Very dense tannish gray Silty Sand	50+					28			15
60		⊗	Very dense gray Poorly Graded Sand - with gravel at 58'	50+					23			
65		⊗		50+					27			5
70		⊗		50+					25			
75		⊗	Firm to stiff gray Sandy Fat Clay			0.75			25	57	38	53
80		⊗				1.00			51			
85		⊗	- dark gray with trace of organics and sand			0.75			51			
90		⊗	Firm to stiff gray Sandy Silty Clay		0.96	1.25		99	25			
95		⊗	Dense gray Silty Sand	47					24			
100		⊗		35					23			

DEPTH OF BORING: 100 Feet  
 DATE: 8/25/2022



**LOG OF BORING B-3**  
**PROPOSED NEW WATER TOWERS**  
**SLIDELL, LOUISIANA**

TYPE OF BORING: WET ROTARY

LOCATION: LEVEE BOARD SITE

PROJECT NO.: G22-092

DEPTH, FT.	SOIL TYPE	SAMPLES	DESCRIPTION	N-BLOWS/FT.	UNCONFINED COMPRESSIVE STRENGTH tsf	HAND PENETROMETER tsf	TORVANE tsf	UNIT DRY WEIGHT pcf	MOISTURE CONTENT %	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200 SIEVE
			10" Silty Topsoil with organics			2.00			20			
			Stiff to very stiff gray Silty Clay									
			Soft to firm tannish gray Lean Clay with sand		0.49	0.50		108	22			
5			- becomes very stiff at 4'			3.75			21			
					2.73	4.00		109	19	49	31	
10			Medium dense tannish gray Silty Clayey Sand			1.50			19			
15			Very dense tannish gray Poorly Graded Sand	50+					24			2
20				50+					24			
25				49					22			2
30				50+					26			
35			- with gravel at 33'	50+					20			6
40			Firm to stiff light gray Sandy Lean Clay			1.00			22			
45			Dense to very dense gray Silty Sand	46					26		NP	30
50				50+					23			

DEPTH OF BORING: 100 Feet  
 DATE: 8/28/2022

GROUNDWATER: Measured at 5 Feet Upon Completion of Drilling



**LOG OF BORING B-3 (continued)**  
**PROPOSED NEW WATER TOWERS**  
**SLIDELL, LOUISIANA**

TYPE OF BORING: WET ROTARY

LOCATION: LEVEE BOARD SITE

PROJECT NO.: G22-092

DEPTH, FT.	SOIL TYPE	SAMPLES	DESCRIPTION	N-BLOWS/FT.	UNCONFINED COMPRESSIVE STRENGTH tsf	HAND PENTROMETER tsf	TORVANE tsf	UNIT DRY WEIGHT pcf	MOISTURE CONTENT %	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200 SIEVE
			Dense to very dense gray Silty Sand									
			Very dense gray Poorly Graded Sand	50+					23			11
55		X										
				50+					22			
60		X										
				50+					24			5
65		X										
			- with gravel at 68'	50+					15			
70		X										
			Loose tannish gray Clayey Sand with gravel	7					18			38
75		X										
			Firm dark gray Fat Clay with sand		0.50	0.75		83	32	55	39	83
80												
			Loose dark gray Clayey Sand	6					23			
85		X										
			Loose gray Poorly Graded Sand	8					28			10
90		X										
			Firm to stiff dark gray Sandy Lean Clay			0.75			31			
95												
						1.00			29			
100												

DEPTH OF BORING: 100 Feet  
 DATE: 8/28/2022



**LOG OF BORING B-4**  
**PROPOSED NEW WATER TOWERS**  
**SLIDELL, LOUISIANA**

TYPE OF BORING: WET ROTARY

LOCATION: LEVEE BOARD SITE

PROJECT NO.: G22-092

DEPTH, FT.	SOIL TYPE	SAMPLES	DESCRIPTION	N-BLOWS/FT.	UNCONFINED COMPRESSIVE STRENGTH tsf	HAND PENETROMETER tsf	TORVANE tsf	UNIT DRY WEIGHT pcf	MOISTURE CONTENT %	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200 SIEVE
			10" Silty Topsoil with organics			0.50			27			
			Soft to firm tannish gray Sandy Lean Clay		0.30	0.75		105	21	27	9	
5			- becomes stiff to very stiff at 4'			1.50			19			
					1.01	3.50		118	18			
10			- gray at 8'			1.50			18			
15			Dense to very dense tannish gray Poorly Graded Sand	50+					22			3
20				32					24			
25				50+					21			2
30				50+					17			
35			- medium dense at 33'	28					19		NP	3
40			Firm gray Sandy Fat Clay	5					24			
45			Loose gray Clayey Sand	8					25	40	26	44
50			Very dense gray Poorly Graded Sand	50+					22			11

DEPTH OF BORING: 100 Feet  
 DATE: 8/31/2022

GROUNDWATER: Measured at 4 Feet Upon Completion of Drilling



**LOG OF BORING B-4 (continued)**  
**PROPOSED NEW WATER TOWERS**  
**SLIDELL, LOUISIANA**

TYPE OF BORING: WET ROTARY

LOCATION: LEVEE BOARD SITE

PROJECT NO.: G22-092

DEPTH, FT.	SOIL TYPE	SAMPLES	DESCRIPTION	N-BLOWS/FT.	UNCONFINED COMPRESSIVE STRENGTH tsf	HAND PENETROMETER tsf	TORVANE tsf	UNIT DRY WEIGHT pcf	MOISTURE CONTENT %	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200 SIEVE
			Very dense gray Poorly Graded Sand									
55			Very dense tannish gray Silty Sand	50+					28			
60			- loose at 58'	7					31		NP	30
65			Very dense gray Poorly Graded Sand with gravel	50+					22			
70				50+					18			4
75				50+					20			
80			- gravel with sand at 78'	42					19			
85			Dense dark gray Silty Sand	40					26			43
90			Stiff dark gray Fat Clay with sand and organics	48					37			
95			Very dense gray Clayey Sand	50+					22			34
100				50+					30			

DEPTH OF BORING: 100 Feet  
 DATE: 8/31/2022





**LOG OF BORING B-5**  
**PROPOSED NEW WATER TOWERS**  
**SLIDELL, LOUISIANA**

TYPE OF BORING: WET ROTARY

LOCATION: LEVEE BOARD SITE

PROJECT NO.: G22-092

DEPTH, FT.	SOIL TYPE	SAMPLES	DESCRIPTION	N-BLOWS/FT.	UNCONFINED COMPRESSIVE STRENGTH tsf	HAND PENETROMETER tsf	TORVANE tsf	UNIT DRY WEIGHT pcf	MOISTURE CONTENT %	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200 SIEVE	
	Brown hatched pattern		10" Sandy Topsoil with organics			2.75			16	31	13	66	
			Very stiff tannish gray Sandy Lean Clay - firm at 2'			0.75			20				
5	Brown hatched pattern		Very stiff reddish tan Sandy Fat Clay		2.85	3.00		108	21				
						3.75			19				
10			- tannish gray at 8'		4.27	4.50		109	17	57	36	70	
15	Yellow dotted pattern	X marks	Dense to very dense tannish gray Poorly Gray Sand	50+					17			8	
20				41					24				
25				45					23			2	
30			- becomes medium dense with gravel at 28'	29					26				
35				18					24			1	
40				18					25				
45			- becomes very dense at 43'	50+					22			4	
50				50+					24				

DEPTH OF BORING: 100 Feet  
 DATE: 8/27/2022

GROUNDWATER: Measured at 3 Feet Upon Completion of Drilling



**LOG OF BORING B-5 (continued)**  
**PROPOSED NEW WATER TOWERS**  
**SLIDELL, LOUISIANA**

TYPE OF BORING: WET ROTARY

LOCATION: LEVEE BOARD SITE

PROJECT NO.: G22-092

DEPTH, FT.	SOIL TYPE	SAMPLES	DESCRIPTION	N-BLOWS/FT.	UNCONFINED COMPRESSIVE STRENGTH tsf	HAND PENETROMETER tsf	TORVANE tsf	UNIT DRY WEIGHT pcf	MOISTURE CONTENT %	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200 SIEVE
			Very dense tannish gray Poorly Graded Sand									
55		⊗	Very dense tannish gray Silty Sand	50+					25			17
60		⊗	Very dense gray Poorly Graded Sand	50+					25			
65		⊗		50+					27			3
70		⊗		50+					29			
75		⊗		50+					23			4
80		⊗		50+					27			
85		⊗	Firm to stiff gray Fat Clay		1.00	1.50		85	33			
90		⊗				1.25			38			
95		⊗	Firm to stiff gray Sandy Lean Clay		0.93	1.25		112	19			
100		⊗				1.00			21			

DEPTH OF BORING: 100 Feet  
 DATE: 8/27/2022



**LOG OF BORING B-6**  
**PROPOSED NEW WATER TOWERS**  
**SLIDELL, LOUISIANA**

TYPE OF BORING: WET ROTARY

LOCATION: LEVEE BOARD SITE

PROJECT NO.: G22-092

DEPTH, FT.	SOIL TYPE	SAMPLES	DESCRIPTION	N-BLOWS/FT.	UNCONFINED COMPRESSIVE STRENGTH tsf	HAND PENETROMETER tsf	TORVANE tsf	UNIT DRY WEIGHT pcf	MOISTURE CONTENT %	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200 SIEVE
	[Diagonal Hatching]		10" Sandy Topsoil with organics			3.00			20			
			Very stiff reddish tan Fat Clay with sand									
			Firm reddish tan Sandy Lean Clay		0.66	0.75		106	19			
5			- with aggregates at 2' - very stiff at 4'	▼		2.25			18			
	[Diagonal Hatching]		- firm to stiff with aggregates at 6'		0.76	1.00		111	18	41	26	53
10			Medium dense to dense reddish tan Poorly Graded Sand	▼	30				21			3
15					48				18			
20					34				22			1
25			- becomes very dense and tannish gray at 23'	50+				21				
30			- with gravel, 28' to 35'	50+				18				2
35				50+				19				
40			- medium dense at 38'	26				27				4
45	[Diagonal Hatching]		Firm to stiff gray Lean Clay			0.75			28	35	16	91
50			- with sand lenses at 48'		0.54	1.00		108	23			

DEPTH OF BORING: 100 Feet  
 DATE: 8/27/2022

GROUNDWATER: Measured at 5 Feet Upon Completion of Drilling



**LOG OF BORING B-6 (continued)**  
**PROPOSED NEW WATER TOWERS**  
**SLIDELL, LOUISIANA**

TYPE OF BORING: WET ROTARY

LOCATION: LEVEE BOARD SITE

PROJECT NO.: G22-092

DEPTH, FT.	SOIL TYPE	SAMPLES	DESCRIPTION	N-BLOWS/FT.	UNCONFINED COMPRESSIVE STRENGTH tsf	HAND PENETROMETER tsf	TORVANE tsf	UNIT DRY WEIGHT pcf	MOISTURE CONTENT %	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200 SIEVE
			Firm to stiff gray Lean Clay									
55		X	Very dense gray Poorly Graded Sand	50+					19			11
60		X		50+					19			
65		X		50+					25			5
70		X		50+					24			
75		X		50+					20			9
80			Soft to firm tannish gray Sandy Lean Clay		0.30	0.50		100	29	41	27	51
85			Firm to stiff gray Fat Clay			1.00			39			
90					1.33	1.50		81	39			
95		X	Very dense gray Poorly Graded Sand	50+					27			2
100			Soft to firm gray Fat Clay		0.34	0.50		84	37			

DEPTH OF BORING: 100 Feet  
 DATE: 8/27/2022



## LOG OF BORING B-7

### PROPOSED NEW WATER TOWERS SLIDELL, LOUISIANA

TYPE OF BORING: WET ROTARY

LOCATION: LEVEE BOARD SITE

PROJECT NO.: G22-092

DEPTH, FT.	SOIL TYPE	SAMPLES	DESCRIPTION	N-BLOWS/FT.	UNCONFINED COMPRESSIVE STRENGTH tsf	HAND PENETROMETER tsf	TORVANE tsf	UNIT DRY WEIGHT pcf	MOISTURE CONTENT %	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200 SIEVE
			10" Silty Topsoil with organics			1.00			24	28	7	
			Firm to stiff tannish gray Silty Clay									
			Stiff to very stiff reddish tan Lean Clay with sand			2.50			20			
5					1.45	2.75		111	20	41	23	83
						3.00			20			
10			- tannish gray at 8'		2.13	3.50		109	18			
15			Dense to very dense reddish tan Silty Sand	36					23		NP	35
20			- becomes tannish gray at 18'	50+					21			22
25			- with gravel at 23'	41					21			
30			Very dense tannish gray Poorly Graded Sand with gravel	50+					19			10
35				50+					18			
40				50+					17			6
			Boring Terminated at 40 Feet									
45												
50												

DEPTH OF BORING: 40 Feet  
DATE: 8/28/2022

GROUNDWATER: Measured at 9 Feet Upon Completion of Drilling



**LOG OF BORING B-8**  
**PROPOSED NEW WATER TOWERS**  
**SLIDELL, LOUISIANA**

TYPE OF BORING: WET ROTARY

LOCATION: WILLOW WOOD SITE

PROJECT NO.: G22-092

DEPTH, FT.	SOIL TYPE	SAMPLES	DESCRIPTION	N-BLOWS/FT.	UNCONFINED COMPRESSIVE STRENGTH tsf	HAND PENETROMETER tsf	TORVANE tsf	UNIT DRY WEIGHT pcf	MOISTURE CONTENT %	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200 SIEVE
			10" Silty Topsoil with organics			4.50			9			
			Stiff to very stiff gray Silty Clay		1.01	3.50		106	13			
5			Firm to stiff tannish gray Lean Clay with sand			1.00			25			
			- very stiff at 6'		3.13	3.25		113	18			
10			Stiff to very stiff light gray Fat Clay			3.00			22			
			- with sand lenses, 8' to 15'									
15					1.85	2.75		104	24			
20			- with silt seams at 18'			2.00			29			
25			- firm with sand at 23'		0.63	0.75		89	34			
30			Loose gray Silty Sand	9					24			14
35			Loose to medium dense gray Clayey Sand	10					26	33	12	26
40				12					37			
45			Firm to stiff gray Lean Clay with sand		0.93	1.25		105	22	30	16	77
50						1.50			20			

DEPTH OF BORING: 100 Feet  
 DATE: 9/2/2022

GROUNDWATER: Not Encountered in Upper 20 Feet During Drilling



**LOG OF BORING B-8 (continued)**  
**PROPOSED NEW WATER TOWERS**  
**SLIDELL, LOUISIANA**

TYPE OF BORING: WET ROTARY

LOCATION: WILLOW WOOD SITE

PROJECT NO.: G22-092

DEPTH, FT.	SOIL TYPE	SAMPLES	DESCRIPTION	N-BLOWS/FT.	UNCONFINED COMPRESSIVE STRENGTH tsf	HAND PENETROMETER tsf	TORVANE tsf	UNIT DRY WEIGHT pcf	MOISTURE CONTENT %	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200 SIEVE
			Firm to stiff gray Lean Clay with sand									
55			Firm gray Sandy Lean Clay		0.61	0.75		111	21			
60			Very dense gray Silty Sand	50+					19			16
65		50+						17				
70				40				16				18
75			Medium dense gray Clayey Sand with gravel	27					23			
80			Stiff gray Sandy Lean Clay		1.27	1.50		99	25	36	20	58
85			Stiff gray Fat Clay			1.25			45			
90			- very stiff with sand at 88'	26					39			
95			Stiff gray Sandy Fat Clay		1.36	1.50		104	23			
100			- firm at 98'			0.75			29			

DEPTH OF BORING: 100 Feet  
 DATE: 9/2/2022



**LOG OF BORING B-9**  
**PROPOSED NEW WATER TOWERS**  
**SLIDELL, LOUISIANA**

TYPE OF BORING: WET ROTARY

LOCATION: WILLOW WOOD SITE

PROJECT NO.: G22-092

DEPTH, FT.	SOIL TYPE	SAMPLES	DESCRIPTION	N-BLOWS/FT.	UNCONFINED COMPRESSIVE STRENGTH tsf	HAND PENETROMETER tsf	TORVANE tsf	UNIT DRY WEIGHT pcf	MOISTURE CONTENT %	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200 SIEVE
0			10" Silty Topsoil with organics			2.00			18			
5			Stiff to very stiff gray Silty Clay - becomes firm at 2'		0.53	0.75		105	21			
5						0.75			21			
10			Stiff to very stiff tannish gray Lean Clay		1.73	2.50		107	21			
10			Stiff to very stiff tannish gray Fat Clay			2.50			25			
15			- with silt seams at 13'		1.81	2.00		93	30			
20			- gray at 18'			1.50			46			
25			Soft to firm dark gray Organic Clay		0.30	0.50		36	119			
30			Medium dense gray Clayey Sand	11					27			
35				19					22	36	16	33
40			Medium dense gray Poorly Graded Sand	24					29		NP	12
45			Stiff tannish gray Fat Clay		1.29	1.50		99	25			
50			Firm tannish gray Lean Clay			0.75			24			

DEPTH OF BORING: 100 Feet  
 DATE: 9/6/2022

GROUNDWATER: Measured at 8 1/2 Feet Upon Completion of Drilling





**LOG OF BORING B-9 (continued)**  
**PROPOSED NEW WATER TOWERS**  
**SLIDELL, LOUISIANA**

TYPE OF BORING: WET ROTARY

LOCATION: WILLOW WOOD SITE

PROJECT NO.: G22-092

DEPTH, FT.	SOIL TYPE	SAMPLES	DESCRIPTION	N-BLOWS/FT.	UNCONFINED COMPRESSIVE STRENGTH tsf	HAND PENETROMETER tsf	TORVANE tsf	UNIT DRY WEIGHT pcf	MOISTURE CONTENT %	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200 SIEVE
			Firm tannish gray Lean Clay									
			Loose gray Clayey Sand	8					26			
55		X										
			- becomes very dense at 58'	39					24			31
60		X										
				50+					21			
65		X										
				50+					20			23
70		X										
			Very dense gray Poorly Graded Sand with gravel	42					20			6
75		X										
			Firm gray Sandy Fat Clay	9					28			
80		X										
			Loose gray Clayey Sand with gravel			0.75			26	68	45	46
85		X										
			Medium dense gray Gravelly Sand	14					18			
90		X										
			Firm gray Fat Clay with organics			0.75			48			
95		X										
						0.75			45			
100		X										

DEPTH OF BORING: 100 Feet  
 DATE: 9/6/2022



**LOG OF BORING B-10**  
**PROPOSED NEW WATER TOWERS**  
**SLIDELL, LOUISIANA**

TYPE OF BORING: WET ROTARY

LOCATION: WILLOW WOOD SITE

PROJECT NO.: G22-092

DEPTH, FT.	SOIL TYPE	SAMPLES	DESCRIPTION	N-BLOWS/FT.	UNCONFINED COMPRESSIVE STRENGTH tsf	HAND PENETROMETER tsf	TORVANE tsf	UNIT DRY WEIGHT pcf	MOISTURE CONTENT %	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200 SIEVE
			12" Silty Topsoil with organics			4.50			10			
			Stiff to very stiff gray Silty Clay with sand		1.07	3.50		103	12	24	5	85
5			Stiff to very stiff tannish gray Lean Clay with silt seams			2.50			15			
					1.47	3.25		109	18			
10						4.50			13			
				▼								
				▼								
15					1.37	2.00		99	25			
20			Stiff to very stiff tannish gray Fat Clay with sand lenses			2.00			34			
25			- firm to stiff dark gray with organics at 23'		0.85	1.50		56	67			
30		⊗	Medium dense gray Clayey Sand	19					29			
35			Stiff to very stiff gray Sandy Lean Clay		1.18	3.50		108	21	32	11	50
40		⊗	Very stiff dark gray Organic Clay	28					127			
			Boring Terminated at 40 Feet									
45												
50												

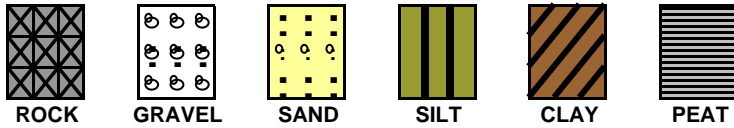
DEPTH OF BORING: 40 Feet  
 DATE: 8/28/2022

GROUNDWATER: Measured at 11 Feet Upon Completion of Drilling

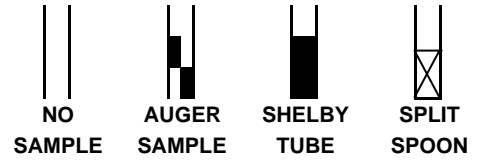


## KEY TO TERMS AND SYMBOLS USED ON LOGS

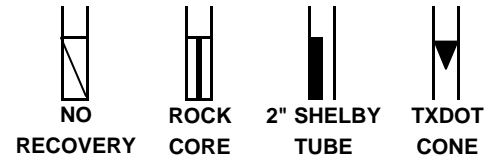
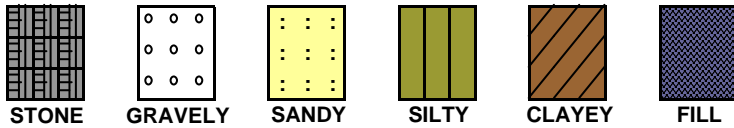
### SOIL TYPE



### SAMPLER TYPE



### MODIFIERS



### UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D 2487 (1980)

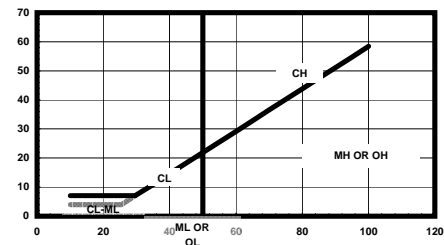
MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTIONS	
COARSE GRAINED SOILS	GRAVEL & GRAVELLY SOILS	CLEAN GRAVEL (LITTLE OR NO FINES)	<b>GW</b>	WELL GRADED GRAVEL, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES	
		LESS THAN 50% PASSING NO. 4 SIEVE	<b>GP</b>	POORLY GRADED GRAVEL, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES	
	50% PASSING NO. 4 SIEVE	SANDS	CLEAN SANDS (LITTLE FINES)	<b>GM</b>	SILTY GRAVEL, GRAVEL-SAND-SILT MIXTURES
			MORE THAN LITTLE FINES	<b>GC</b>	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	50% PASSING NO. 200 SIEVE	50% PASSING NO. 4 SIEVE	SANDS WITH APPREA. FINES	<b>SW</b>	WELL GRADED SAND, GRAVELY SAND (LITTLE FINES)
				<b>SP</b>	POORLY GRADED SANDS, GRAVELY SAND (L.FINES)
		NO. 200 SIEVE	SANDS WITH APPREA. FINES	<b>SM</b>	SILTY SANDS, SAND-SILT MIXTURES
				<b>SC</b>	CLAYEY SANDS, SAND-CLAY MIXTURES
	FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50	<b>ML</b>	INORGANIC SILTS & VERY FINE SANDS, ROCK FLOUR SILTY OR CLAYEY FINE SANDS OR CLAYEY SILT W/ LOW PI
				<b>CL</b>	INORGANIC CLAY OF LOW TO MEDIUM PI LEAN CLAY GRAVELY CLAYS, SANDY CLAYS, SILTY CLAYS
<b>OL</b>				ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PI	
50% PASSING NO. 200 SIEVE		SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50	<b>MH</b>	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
	<b>CH</b>			INORGANIC CLAYS OF HIGH PLASTICITY FAT CLAYS	
	<b>OH</b>			ORGANIC CLAYS OF MED TO HIGH PI, ORGANIC SILT	
HIGHLY ORGANIC SOIL			<b>PT</b>	PEAT AND OTHER HIGHLY ORGANIC SOILS	
UNCLASSIFIED FILL MATERIALS			ARTIFICIALLY DEPOSITED AND OTHER UNCLASSIFIED SOILS AND MAN-MADE SOIL MIXTURES		

### CONSISTENCY OF COHESIVE SOILS

CONSISTENCY	SHEAR STRENGTH IN TONS/FT <sup>2</sup>
VERY SOFT	0. TO 0.125
SOFT	0.125 TO 0.25
FIRM	0.25 TO 0.5
STIFF	0.5 TO 1.0
VERY STIFF	1.0 TO 2.0
HARD	> 2.0 OR 2.0+

### RELATIVE DENSITY - GRANULAR SOILS

CONSISTENCY	N-VALUE (BLOWS/FOOT)
VERY LOOSE	0-4
LOOSE	4-9
MEDIUM DENSE	10-29
DENSE	30-49
VERY DENSE	> 50 OR 50+



### ABBREVIATIONS

HP - HAND PENETROMETER      UC - UNCONFINED COMPRESSION TEST  
 TV - TORVANE                      UU - UNCONSOLIDATED UNDRAINED TRIAXIAL  
 MV - MINIATURE VANE            CU - CONSOLIDATED UNDRAINED

NOTE: PLOT INDICATES SHEAR STRENGTH AS OBTAINED BY ABOVE TESTS

DELAYED GROUNDWATER LVL  
 LEVEL GROUNDWATER ENCOUNTERED

### CLASSIFICATION OF GRANULAR SOILS

U.S. STANDARD SIEVE SIZE(S)

BOUL- -DERS	6"	3"	3/4"	4	10	40	200	SILT	CLAY
	COBBLES	GRAVEL		SAND					
		COARSE	FINE	COARSE	MEDIUM	FINE			
	152	76.2	19.1	4.76	2.0	0.42	0.075		0.002
				GRAIN SIZE IN MM					