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., Tuesday, July 23, 2024,** and then opened and read publicly at that time by the Procurement Staff for the following project:

Bid # 24-27-2 – Post Oak Sewer Consolidation & Faubourg Lift Station Improvements

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 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.

A Non-Mandatory pre-bid meeting will be held at St. Tammany Parish Government Office Complex, Building "B" 21454 Koop Dr. Mandeville, LA 70471, 3rd Floor Staff Conference Room on Tuesday, July 9, 2024, from 2:00 PM to 4:00 PM. Attendance is strongly encouraged.

Procurement Department

BID PROPOSAL

ST. TAMMANY PARISH
GOVERNMENT

BID PACKAGE FOR

Post Oak Sewer Consolidation &
Faubourg Lift Station Improvements

BID NO.: 24-27-2

May 22, 2024

Section 01

Table of Contents

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 **three hundred sixty-five (365) 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. In accordance with Louisiana Law, all Corporations (See LA R.S. 12:26.1) and Limited Liability Companies (See LA R.S. 12:1308.2) must be registered and in good standing with the Louisiana Secretary of State in order to hold a contract.

32. 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.**

33. 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

34. See Notice to Bidders for availability of Drawings, Specifications and Contract Documents via electronic methods.

35. 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.

36. 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.

37. At least three days prior to the execution of the Contract, the Contractor shall deliver to the Owner the required Bonds.

38. 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.

39. 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.

40. 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.

41. 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.

42. 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.

43. 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.

44. 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.

45. 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.

46. 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.

47. Contractor authorizes Parish to deduct from any payment due herein costs and service fees for recordation of this Contract in full or an excerpt hereof, or any revisions or modifications thereof as required by law. Contractor agrees to execute an excerpt or extract of this agreement for recordation purposes. If Contractor fails to execute such an excerpt, then the Parish shall file and record the entire Contract and all attachments at the expense of Contractor and Parish is hereby authorized to deduct all related costs from any proceeds due to the Contractor.

48. 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.

49. 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.

50. 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.

51. Deductibles: Any and all deductibles in the described insurance policies shall be assumed by and be at the sole risk of the Contractor.

52. 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.

53. 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.

54. 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.

55. 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.

56. 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.

57. 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).

58. 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.

59. 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. Any questions or inquiries received after the required deadline to submit questions or inquiries will not be answered.

Schedule of Events

	Date	Time (CT)
Bid Due Date	July 23, 2024	2:00 pm
Inquiry Deadline	July 12, 2024	2:00 pm
Addendum Deadline	July 18, 2024	2:00 pm

NOTE: The Parish reserves the right to revise this schedule. Any such revision will be formalized by the issuance of an addendum to the Bid Request.

60. 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.

61. 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).

62. 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.

63. 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:

The contractor shall provide all labor, equipment, tools, testing, and material necessary to complete the work in accordance with the construction drawings and project specifications for the Post Oak Sewer Consolidation & Faubourg Lift Station Improvements, Madisonville, Louisiana

II. Location of Work:

The work is located at the following locations:

- Post Oak 300 Coquille Ln, Madisonville, LA 70447
- Faubourg II 69409 Hwy 1077,Covingtom, LA 70433

III. Documents: Bid Documents dated May 22, 2024, and entitled:

Post Oak Sewer Consolidation & Faubourg Lift Station Improvements
BID No. 24-27-2

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 (2016 Edition of Louisiana Standard Specifications for Roads and Bridges).

This project is federally grant funded and therefore requires the Contractor to have a Unique Entity Identification number (UEI). The Contractor should submit with their response their UEI number. If the Contractor does not have a UEI already, then they must register at the below link before an award can be made.

https://sam.gov/content/entity-registration

Table 3.1

Liquidated Damages	
Original Contract Amount	**Daily Charge**
Dollars	Dollars
0 - 250,000	500
250,000 – 1 Million	1,000
> 1 Million – 5 Million	1,500
> 5 Million – 10 Million	2,000
> 10 Million	3,000

- Parish reserves the right to increase the Daily charge rate due to additional provisions required in order to complete the project as described in the specifications

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: Post Oak Sewer Consolidation & Faubourg Lift Station Improvements

BID No. 24-27-2

(*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: Professional Engineering Consultants Corporation and dated: May 22, 2024.
(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 Manhole Coatings and Inserts for the lump sum of:

_____Dollars ($ _____)

Alternate No. 2 *(Owner to provide description of alternate and state whether add or deduct)* for the lump sum of:

NOT APPLICABLE Dollars ($ NOT APPLICABLE)

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

NOT APPLICABLE Dollars ($ NOT APPLICABLE)

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.

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:

Post Oak Sewer Consolidation & Faubourg

Lift Station Improvements

BID No.: 24-27-2

(OWNER TO PROVIDE PROJECT NAME & OTHER IDENTIFYING INFO)

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

Description:	☑ BASE BID OR ☐ ALT #		Mobilization & Demobilization	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
001	1	Lump Sum		
Description:	☑ BASE BID OR ☐ ALT #		Construction Layout	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
002	1	Lump Sum		
Description:	☑ BASE BID OR ☐ ALT #		Temporary Signage, Traffic Control, And Barricades	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
003	1	Lump Sum		
Description:	☑ BASE BID OR ☐ ALT #		Post Oak WWTP Demolition & Equipment Salvage	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
004	1	Lump Sum		
Description:	☑ BASE BID OR ☐ ALT #		Demolition & Modifications To The Existing Post Oak Lift Station	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
005	1	Lump Sum		

Description:	☑ BASE BID OR ☐ ALT #		Rehabilitation Of The Existing Myrtle Grove Lift Station	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
006	1	Lump Sum		
Description:	☑ BASE BID OR ☐ ALT #		Rehabilitation Of The Existing Faubourg Lift Station No. 1	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
007	1	Lump Sum		
Description:	☑ BASE BID OR ☐ ALT #		Demolition And Modification To The Existing Faubourg Lift Station No. 2	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
008	1	Lump Sum		
Description:	☑ BASE BID OR ☐ ALT #		New Post Oak Lift Station Complete & In Place Including All Mechanical, Civil, Structural & Electrical Work As Shown	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
009	1	Lump Sum		
Description:	☑ BASE BID OR ☐ ALT #		New Faubourg Lift Station Coomplete & In Place Including All Mechanical, Civil, Structural & Electrical Work As Shown	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
010	1	Lump Sum		
Description:	☑ BASE BID OR ☐ ALT #		Directional Drill 6" Sewer Force Main (HDPE DR-11)	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
011	1,500	Linear Foot		

Description:	☑ BASE BID OR ☐ ALT #		Directional Drill 12" Sewer Force Main (HDPE DR-11)	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
012	1,000	Linear Foot		
Description:	☑ BASE BID OR ☐ ALT #		Furnish & Install Ductile Iron Fittings (All Types, All Sizes)	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
013	2100	Pound		
Description:	☑ BASE BID OR ☐ ALT #		Furnish & Install Sewer Valve-6"	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
014	1	Each		
Description:	☑ BASE BID OR ☐ ALT #		Furnish & Install Sewer Valve - 12"	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
015	3	Each		
Description:	☑ BASE BID OR ☐ ALT #		2" Air Release Valve Assembly Including Manhole	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
016	1	Each		
Description:	☑ BASE BID OR ☐ ALT #		6" Dia. HDPE Tie In At 8" Dia. SFM On LA Hwy 1077 Including All Fittings, Couplings, Valves, Piping, Etc. As Detailed	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
017	1	Each		

Description:	☑ BASE BID OR ☐ ALT #		Gravity Sewer Pipe 12" (PVC, SDR 26) (8.1' - 10' Depth)	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
018	22	Linear Foot		
Description:	☑ BASE BID OR ☐ ALT #		Gravity Sewer Pipe 21" (PVC, SDR 26) (8.1' - 10' Depth)	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
019	35	Linear Foot		
Description:	☑ BASE BID OR ☐ ALT #		Furnish And Install 60" Concrete Sewer Manhole - Less Than 10' Depth	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
020	1	Each		
Description:	☑ BASE BID OR ☐ ALT #		Exploratory Excavation	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
021	3	Each		
Description:	☑ BASE BID OR ☐ ALT #		Initial Set-Up Bypass Pumping And Equipment	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
022	1	Lump Sum		
Description:	☑ BASE BID OR ☐ ALT #		Bypass Pumping (Flow Control)	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
23	30	Day		

Description:	☐ BASE BID OR ☑ ALT # 1		Sewer Manhole Coating	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
AA-1.1	2520	Square Foot		
Description:	☐ BASE BID OR ☑ ALT # 1		Furnish & Install Manhole Inserts	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
AA-1.2	40	Each		
Description:	☐ BASE BID OR ☑ ALT # 1		Additional Mobilization	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
AA-1.3	1	Lump Sum		
Description:	☐ BASE BID OR ☑ ALT # 1		Additional Bypass Pumping (Flow Control)	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
AA-1.4	1	Lump Sum		

Wording for "description" is to be provided by the Owner. All Quantities Estimated. The Contractor will be paid based upon actual quantities as verified by the Owner.

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: _____

Section 06
INSURANCE REQUIREMENTS*

Construction Project: Post Oak Sewer Consolidation & Faubourg Lift Station Improvements_

Project/Quote/Bid#: 24-27-2_____

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 $1,000,000 per Occurrence / $2,000,000 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 $,000,000 CSL each occurrence / $1,000,000 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 as an "all-risk" policy providing coverage in an amount at or greater than one hundred percent (100%) of the completed value of the contracted project. 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 named as a Loss Payee 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 named as a Loss Payee 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 signs to be installed one at each of the following locations:

POST OAK	300 COQUILLE LN	MADISONVILLE	70447
FAUBOURG II	69409 HWY 1077	COVINGTON	70433

The exact location of the signs will be determined by the field Engineer.

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.

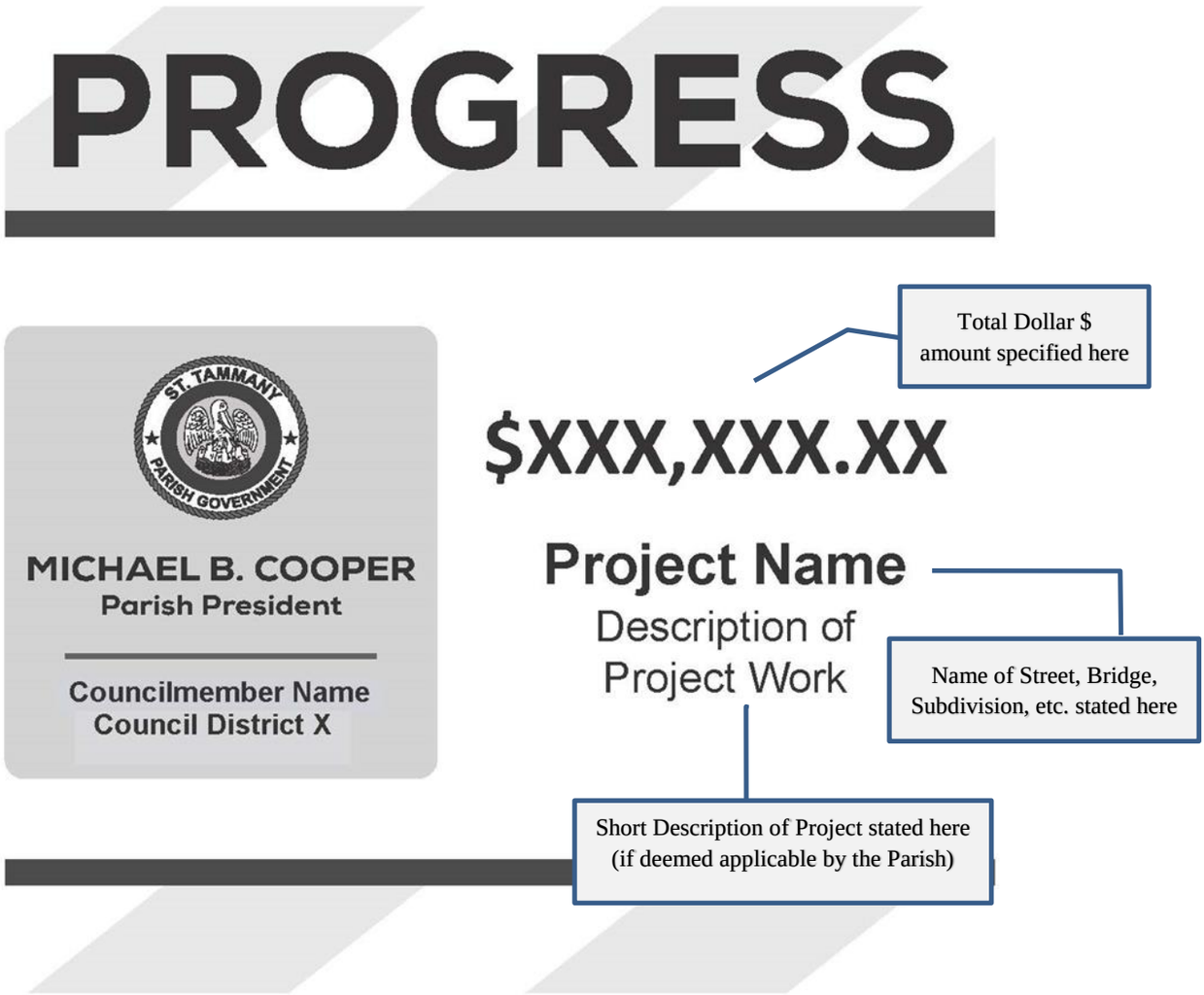
d. The sign(s) is to be installed such that the bottom of the sign is a minimum of 5' above the existing ground elevation.

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 "Temporary Signs and Barricades

Blank Template of Parish Project Sign:



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.

GENERAL CONDITIONS INDEX

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 Contractor 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 See Notice to Bidders for availability of Drawings, Specifications and Contract Documents via electronic methods.

02.24 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.

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 based on **Table 3.1** 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 per **Table 3.1** 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 Contractor, 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 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 $1,000,000 per Occurrence/$2,000,000 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 $1,000,000 combined single limit (CSL) each occurrence, $2,000,000 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

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 Pubic 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. Any questions or inquires received after the required deadline to submit questions or inquires will not be answered.

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 DESIGN ATED AS AGENT AND ATTORNEY-IN-FACT OF THE CORPORATION WITH FU LL 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 ACCEPTINGEACH 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

_____

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

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	
	GENERAL LIABILITY						EACH OCCURRENCE	$
	☐ COMMERCIAL GENERAL LIABILITY						DAMAGE TO RENTED PREMISES (Ea occurrence)	$
	☐ CLAIMS-MADE ☐ OCCUR						MED EXP (Any one person)	$
							PERSONAL & ADV INJURY	$
							GENERAL AGGREGATE	$
	GEN'L AGGREGATE LIMIT APPLIES PER:						PRODUCTS - COMP/OP AGG	$
	☐ POLICY ☐ PRO-JECT ☐ LOC							$
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$
	☐ ANY AUTO						BODILY INJURY (Per person)	$
	☐ ALL OWNED AUTOS ☐ SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	☐ HIRED AUTOS ☐ NON-OWNED AUTOS						PROPERTY DAMAGE (Per accident)	$
								$
	☐ **UMBRELLA LIAB** ☐ OCCUR						EACH OCCURRENCE	$
	☐ **EXCESS LIAB** ☐ CLAIMS-MADE						AGGREGATE	$
	☐ DED ☐ RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						☐ WC STATU-TORY LIMITS ☐ OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? ☐ N / A **(Mandatory in NH)**						E.L. EACH ACCIDENT	$
	If yes, describe under DESCRIPTION OF OPERATIONS below						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

St. Tammany Parish Government
P.O. Box 628
Covington, LA 70434

CANCELLATION

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

Bond No.:_____

CONTRACT AGREEMENT

BETWEEN PARISH AND CONTRACTOR

BY: ST. TAMMANY PARISH GOVERNMENT

WITH:

UNITED STATES OF AMERICA

STATE OF LOUISIANA

ST. TAMMANY PARISH

This agreement is entered into this_____day of_____, 20___, by and between: «txtREQCompanyName», hereinafter called the "Contractor", whose business address is «txtREQAddress», «txtREQCity», «txtREQState» «txtREQZip» and the St. Tammany Parish Government, hereinafter called the "Parish", whose business address is P.O. Box 628, Covington, LA 70434 (collectively, the "Parties") for «txtPROJECTNAME» project. Witnessed that the Contractor and the Parish, in consideration of premises and the mutual covenants, consideration and agreement herein contained, agree as follows:

1. SCOPE OF SERVICES

The Contractor shall furnish all labor and materials and perform all of the work required to build, construct and/or complete in a thorough and workmanlike manner:

«txtScopeSummary»

2. CONSTRUCTION DOCUMENTS

It is recognized by the Parties herein that said Construction Documents, including by way of example and not of limitation, the plans and Specifications, General Conditions, Supplementary General Conditions, any addenda thereto, the drawings (if any), and the bid, quote or other procurement documents impose duties and obligations upon the Parties herein, and said Parties thereby agree that they shall be bound by said duties and obligations. For these purposes, all of the provisions contained in the aforementioned Construction Documents are incorporated herein by reference with the same force and effect as though said Construction Documents were herein set out in full. Copies of the aforementioned Construction Documents are in the possession of both the Contractor and the Parish for reference.

3. TIME FOR COMPLETION

The work shall be commenced on a date to be specified in a written order of the Parish and shall be completed within «intCompletionTime» calendar days from and after said date.

4. COMPENSATION TO BE PAID TO THE CONTRACTOR

The Parish will pay and the Contractor will accept in full consideration for the performance of the Contract the sum of «curREQGrandTotal» dollars.

5. PERFORMANCE AND PAYMENT BOND

To these presents personally came and intervened _____,
(Name of Attorney in Fact)
herein acting for _____, a corporation organized
(Surety)
and existing under the laws of the State of _____, and duly authorized to transact business in the State of Louisiana, as surety, who declared that having taken cognizance of this Contract and of the Construction Documents mentioned herein, he hereby in his capacity as its Attorney in Fact obligates his company, as surety for the said Contractor, unto the said Parish, up to the sum of «curREQGrandTotal». The condition of this performance and payment bond

shall be that should the Contractor herein not perform the Contract in accordance with the terms and conditions hereof, or should said Contractor not fully indemnify and save harmless the Parish from all costs and damages which he may suffer by said Contractor's non-performance or should said Contractor not pay all persons who have fulfilled obligations to perform labor and/or furnish materials in the prosecution of the work provided for herein, including by way of example, workmen, laborers, mechanics, and furnishers of materials, machinery, equipment and fixtures, then said surety agrees and is bound to so perform the Contract and make said payment(s).

Contractor and Parish specifically agree to and recognize (1) the statutory employer relationship existing between the Parish and any employees performing work under this Contract as employees of the Contractor or employees of the "Sub-Contractor", and (2) that the work performed by the employees of the Contractor and the employees of the "Sub-Contractor" is part of the Parish's business, occupation or trade and is essential to the ability of the Parish to generate their products or services, all of which is in accordance with LSA-R.S. 23:1061, and as may be amended.

6. LIABILITY AND INDEMNIFICATION

A. Duty to Defend

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.

B. Contractor Liability

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.

C. Force Majeure

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.

D. Indemnification

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.

E. Intellectual Property Indemnification

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.

7. MODIFICATION OF CONTRACT TERMS

Provided that any alterations which may be made in the terms of the Contract or in the work to be done under it, or the giving by the Parish of any extensions of time for the performance of the Contract, or any other forbearance on the part of either the Parish or the Contractor to the other shall not in any way release the Contractor or the Surety from their liability hereunder, notice to the Surety of any such alterations, extensions or other forbearance being hereby waived.

8. TERMINATION, CANCELLATION, AND SUSPENSION

A. Termination

The term of this Contract shall be binding upon the Parties hereto until the work has been completed by the Provider and accepted by the Parish, and all payments required to be made to the Provider have been made. But, this Contract may be terminated upon thirty (30) days written notice under any or all of the following conditions:

1) By mutual agreement and consent of the Parties hereto;

2) By the Parish as a consequence of the failure of the Provider to comply with the terms, progress, or quality of the work in a satisfactory manner, proper allowances being made for circumstances beyond the control of the Provider;

3) By either party upon failure of the other party to fulfill its obligations as set forth in this Contract;

4) By the Parish with less than thirty (30) days' notice due to budgetary reductions and changes in funding priorities by the Parish;

5) In the event of the abandonment of the project by the Parish.

Upon termination, the Provider shall be paid for actual work performed prior to the Notice of Termination, either based upon the established hourly rate for services actually performed, or on a pro-rata share of the basic fee based upon the phase or percentage of work actually completed, depending on the type of compensation previously established under this Contract.

Upon Termination, the Provider shall deliver to the Parish all original documents, notes, drawings, tracings, computer files, and other files pertaining to this Contract or the Work performed, except for the Provider's personal and administrative files.

B. Cancellation

The continuation of this Contract is contingent upon the appropriation of funds to fulfill the requirements of the Contract by the Parish. If the Parish fails to appropriate sufficient monies to provide for the continuation of this or any other Contract, or if such appropriation is reduced by the veto of Parish President by any means provided in the appropriations Ordinance to prevent the total appropriation for the year from exceeding revenues for that year, or for any other lawful purpose, and the effect of such reduction is to provide insufficient monies for the continuation of the Contract, the Contract shall terminate on the date of the beginning of the first fiscal year for which funds are not appropriated. It is understood and agreed that paragraph (9)(C) below may preempt this paragraph, all at the exclusive and unilateral option of the Parish.

C. Suspension

Should the Parish desire to suspend the work, but not definitely terminate the Contract, the Parish shall supply the Provider with thirty (30) days' notice. The Parish will also

supply Provider thirty (30) days' notice that the work is to be reinstated and resumed in full force. Provider shall receive no additional compensation during the suspension period. The Parties may revisit the terms of this Contract during the suspension period. The suspension shall not exceed six (6) months, unless mutually agreed upon between the Parties.

D. 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.

E. In the event of a default and/or breach of this agreement and this matter is forwarded to legal counsel, then the prevailing party may be entitled to collect a reasonable attorney fees and all costs associated therewith whether or not litigation is initiated. Attorney fees shall be based upon the current, reasonable prevailing rate for counsel in the private

sector. The Parties agree to be responsible for such attorney fees, together for all with legal interest from date of agreement breach, plus all costs of collection.

F. Termination or cancellation of this agreement will not affect any rights or duties arising under any term or condition herein.

G. As to the filing of voluntary or involuntary bankruptcy by Provider, Provider agrees that if any execution or legal process is levied upon its interest in this Contract, or if any liens or privileges are filed against its interest, or if a petition in bankruptcy is filed against it, or if it is adjudicated bankrupt in involuntary proceedings, or if it should breach this Contract in any material respect, the Parish shall have the right, at its unilateral option, to immediately cancel and terminate this Contract. In the event that Provider is placed in any chapter of bankruptcy, voluntarily or involuntarily, or otherwise triggers any provision of the preceding sentence herein, it is understood and agreed that all materials, goods and/or services provided shall be and remain the property of the Parish. All rights of Provider as to goods, wares, products, services, materials and the like supplied to Parish shall be deemed forfeited.

9. RECORDATION OF CONTRACT

Contractor authorizes Parish to deduct from any payment due herein costs and service fees for recordation of this Contract in full or an excerpt hereof, or any revisions or modifications thereof as required by law.

10. AUTHORITY TO ENTER CONTRACT

The undersigned representative of Contractor warrants and personally guarantees that he/she has the requisite and necessary authority to enter and sign this Contract on behalf of the corporate entity, partnership, etc. The undersigned Parties warrant and represent that they each have the respective authority and permission to enter this Contract. In the event that Contractor is a member of a corporation, partnership, L.L.C., L.L.P., or any other juridical entity, the Parish requires, as an additional provision, that Contractor supply a certified copy of a corporate resolution authorizing the undersigned to enter and sign this Contract. Another option to fulfill this additional provision he/she can supply Louisiana Secretary of State Business filings confirming that he/she is a managing member of a

corporation, partnership, L.L.C., L.L.P., or any other juridical entity which authorizes the undersigned to enter and sign this Contract.

In Witness thereof, the Parties hereto on the day and year first above written have executed this Contract in **One (1)** counterparts, each of which shall, without proof or accountancy for the other counterparts, be deemed an original thereof.

WITNESSES:

_____
Signature

_____
Print Name

_____
Signature

_____
Print Name

CONTRACTOR:

_____
Signature

_____
Print Name

_____
Title

_____
Date

Bond No.:_____

WITNESSES:

_____
Signature

_____
Print Name

_____
Signature

_____
Print Name

ST. TAMMANY PARISH GOVERNMENT:

_____
Michael B. Cooper
Parish President

_____
Date

APPROVED BY:

_____
Assistant District Attorney- Civil Division

_____
Date

_____
(Surety)

_____
Signature

_____
Print Name

Section 12

Department of the Treasury (DOT) & American Rescue Plan Act (ARPA)
Federal Contract Clauses
WATER SECTOR PROGRAM
31 CFR Part 35 Subpart A

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 $2,000 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 and2 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 of2 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 will 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.

Note:

Davis-Bacon Act is NOT applicable to this project.

Section 13

Summary of Technical Specifications

DIVISION 1

Section Number	Section Title
01010	Summary of Work
01015	Control of Work
01025	Measurement and Payment
01026	Schedule of Values
01041	Project Coordination
01043	Job Site Administration
01045	Cutting and Patching
01046	Modification to Existing Piping
01050	Field Engineering and Surveying
01090	Reference Standards
01152	Requests for Payment
01153	Change Order Procedures
01200	Project Meetings
01310	Construction Scheduling
01335	Site Condition Survey
01340	Shop Drawings, Product Data, and Samples
01380	Construction Photographs and Videos
01390	Excavation Plan
01410	Testing Laboratory Services
01505	Mobilization
01510	Temporary Utilities
01530	Protection of Existing Facilities and Property
01550	Site Access
01560	Temporary Environmental Controls
01570	Traffic Regulation
01600	Material and Equipment
01620	Storage and Protection
01700	Contract Closeout
01710	General Site Cleaning
01720	Project Record Documents
01730	Operating and Maintenance Data
01740	Warranties and Bonds

DIVISION 2

Section Number	Section Title
02000	Temporary Sewer Bypass Pumping
02100	Site Preparation
02140	Dewatering
02160	Sheeting, Shoring and Bracing
02200	Earthwork
02220	Excavation, Backfill, Fill and Grading for Structures
02221	Earth Excavation and Backfill in Trenches

DIVISION 11

Section Number	Section Title
11310	Self-Priming Wastewater Pumps (Post Oak Lift Station)
11312	Submersible Pump Station (Faubourg Lift Station)

DIVISION 12 (NOT USED)

DIVISION 13 (NOT USED)

DIVISION 14 (NOT USED)

DIVISION 15

Section Number	Section Title
15000	General Mechanical
15100	Valves and Appurtenances

DIVISION 16

Section Number	Section Title
16010	Basic Electrical Requirements
16050	Basic Electrical Materials & Methods
16200	Standby Power Generator
16400	Service & Distribution
16401	Overcurrent Protective Device Short-Circuit Study
16402	Overcurrent Protective Device Coordination Study
16403	Overcurrent Protective Device Arc-Flash Study
16410	Surge Protection Devices
16500	Lighting
16900	Control Panel

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS/REQUIREMENTS INCLUDED

A. The work under this contract consists of constructing improvements to the wastewater collection and pumping systems in the Post Oak Landing Subdivision, Myrtle Grove Subdivision, and the Faubourg Lift Station.

B. 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.

C. The Contractor shall perform the work complete, in place and ready for continuous service, and shall include repairs, replacements, and restoration required as a result of damages caused during this construction.

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.

1.02 CONTRACTS

The Contract consists of lump sum and unit price bid items. The lump sum price shall include all labor, materials, equipment and incidentals required to construct the work complete in place. No extras shall be granted for any additional work unless specifically defined as a unit price item.

1.03 WORK SEQUENCE

A. All work to be done under this contract shall be done with minimum inconvenience to the users of the water and sewer systems. The Contractor shall coordinate his work with Department of Utilities and private property owners such that water and sewer service is maintained to all users to the maximum extent possible.

1. Water and/or sewer service interruptions shall be coordinated and scheduled with Department of Utilities prior the interruptions to the extent possible.

2. The Department of Utilities shall be notified immediately by phone and in writing of any emergency or unforeseen interruptions of water and/or sewer service. The contractor shall call (985) 893-1717 to notify the Engineer and Compliance Manager of the service interruption. Written notification shall be provided to the specified points of contact determined the pre-construction meeting.

B. Construct work in stages to accommodate the Owner's use of the premises during the construction period; coordinate the construction schedule and operations with the Owner's representative.

C. Construct the work in stages to provide for public convenience. Do not close off public use of facilities until completion of one stage of construction will provide alternative usage.

1.04 CONSTRUCTION AREAS

A. Contractor shall limit his use of the construction areas for work and storage to allow for:

1. Work by other contractors.
2. Owner use.
3. Public use.

B. Coordinate use of work site under direction of Engineer.

C. Assume full responsibility for the protection and safekeeping of products under this contract, stored on the site.

D. Move any stored products, under Contractor's control, which interfere with operations of the Owner or separate contractor.

E. Obtain and pay for the use of additional storage or work areas needed for operations.

1.05 OWNER OCCUPANCY

A. Owner will have full access to and use of all facilities and sites during the entire period of construction for the conduct of his normal operations. Cooperate with Owner's representative in all construction operations to minimize conflict, and to facilitate Owner usage.

B. Contractor shall at all times conduct his operations as to insure the least inconvenience to the general public.

1.06 SITE CONDITIONS

A. Because of the location of the job site is on the grounds of the two sewer pumping stations, it is imperative that the Contractor schedule and conduct his work in such a manner so as not to interfere in any way with the operation of the pump stations and WWTPs. Trucking through the area, delivering and storing materials and equipment, shall be done with the approval of the engineer. The Contractor's personnel will be allowed to enter the sites, however, they will be allowed to bring equipment and company vehicles only into the sites as necessary in the execution of this contract but may be required to remove them if their presence interferes with the operations of the

stations and plants, all at the discretion of the Engineer. All roadways must remain open throughout the entire construction period.

B. All work of this contract MUST be coordinated with the Department of Utilities (DU) through the Engineer, with proper advanced notice.

C. Sewer service to the existing sites must not be interrupted, the St. Tammany Parish Government will communicate with the residence of each site of the impending source interruption and the tie-in to the system.

D. Any outage of these sites and/or other damages due to the contractor's negligence shall be repaired immediately by the Contractor at no additional cost to the contract. Contractor shall inform the DU at least 72 hours in advance for any coordination required to tie-in the existing lines to the new lines, weather permitting. No work shall begin without express written approval of the DU.

E. No water work is included in this contract work with the exception at the lift station sites.

1.07 BIDDERS TO EXAMINE LOCATION AND PLANS

A. Each Bidder shall make a personal examination at the location of the proposed work and the surrounding area. They shall thoroughly acquaint themselves with the details of the work to be done, conditions, and obstacles likely to be encountered in the performance and completion of the work. Bidders shall familiarize themselves as to the facilities for the transportation, handling, and storage of equipment and materials.

B. Each bidder shall carefully study the plans, specifications and other contract documents to thoroughly familiarize themselves to the conditions under which the work is to be done, the character, qualities, quantities of work to be performed, materials to be furnished, and be prepared to execute a finished job in every particular.

1.08 UTILITY LOCATION

A. The locations of all utilities shown on the plans are approximate. Contractor shall field verify all utilities and their tie-in area prior to any work commences.

B. Any damages to any utility line due to lack of the contractor's field verification shall be repaired immediately to the satisfaction of the Engineer, all at no additional cost to the contract.

1.09 TIE-INS

A. The location and condition of tie-ins are approximate. It is the contractor's responsibility, as the first order of business to field verify the location and the conditions of the tie-ins prior to ordering any materials and inform the Engineer of the

findings.

B. Additionally, once the tie-in sites are exposed, the contractor MUST notify the DU to operate and exercise the isolation valve(s) to verify if they are operable. (**ALL existing valves shall be operated by operations personnel of DU only**).

1.10 ENVIRONMENTAL REQUIREMENTS

A. The Contractor agrees that the work and duties required to be performed in accordance with the Contract Documents shall meet and comply with all environmental requirements including the laws and regulations of the United States and the State of Louisiana.

B. The Contractor shall develop a plan to report, contain/by-pass and clean up all sewage spills or unanticipated hazards that would adversely affect the health of the community.

C. For public areas that have come in contact with overflowed sewage, the Contractor shall take reasonable action(s) to implement disinfection procedures. Generally, these procedures will involve an application of an oxidizing agent such as a diluted chlorine solution on constructed surfaces (streets, driveways, walls, etc.) and a lime application on organic surfaces (lawns, soil areas, etc.). The level and extent of disinfection shall be determined in the field. It is not the intent of this disinfection procedure to infer that total pathogen destruction has been achieved, nor that any other level of disinfection has been achieved.

D. REPORT: A report shall be given immediately to the DU Compliance Office (985-893-1717). The information communicated in the report must include location, nature of problem, name of project, name of company performing work, name of the individual making the call, time of incident, volume of spill (gallons), method of remediation and clean up, and other pertinent data as necessary.

1.11 NOISE and SOUND ISSUE

A. Contractor's attention shall be given specifically to St. Tammany Parish Ordinance, Article IV – Noise and Sound, which in part states that the sound measured by a performer taken at least 25 feet from the source of the noise cannot exceed 70 decibels between Noon and 9 p.m. Between 9 p.m. and Noon, the sound measurement taken at least 25 feet from the source of the noise cannot exceed 55 decibels.

1.12 NIGHT, WEEKEND OR HOLIDAY WORK

A. Normal work hours are 7:00 a.m. to 6:00 p.m. Monday through Friday, excluding holidays. Hours requested outside normal work hours should be requested in writing at least 72 hours in advance. Contractor shall be required to pay resident inspection fees for work outside normal working hours. Night, weekend or holiday work requiring the

presence of an Engineer or inspector will be permitted only in cases of emergency, and then only to such an extent as is absolutely necessary and with the written permission of the DU through the Engineer. In the event such work becomes necessary, no extra payment will be made therefor.

1.13 LONG LEAD ITEMS

A. Due to long delivery of certain items specified in this contract work, it is strongly recommended that the Contractor order those long delivery items as soon as Notice of Award has been issued (this includes any approved substitute equipment). Contract substantial completion date shall not be extended due to contractor's negligence in ordering material and/or equipment in timely manner.

1.14 AS-BUILT DRAWINGS

A. The Contractor shall furnish one (1) neat and legibly marked blue line set of contract drawings to depict actual "as-built" conditions.

B. The "as-built" drawings shall show all construction, elevation, equipment, mechanical and electrical systems and connections as installed or built.

C. The work under this contract will not be considered "complete" until "as-built" drawings, prepared to the satisfaction of the Engineer, are received.

D. There will be no direct payment for furnishing the "as-built" drawings specified above.

E. Provide copies of operation and maintenance manuals for all equipment. Manuals shall include spare parts lists recommended by the manufacturer.

1.15 JOB SITE DRAWINGS AND SPECIFICATIONS

A. A complete and current set of contract drawings and specifications (including any addenda) shall be maintained on the job site by the Contractor.

B. One copy of all approved shop drawings, equipment or material drawings, etc. shall be maintained on the job site by the Contractor.

1.16 EMERGENCY TELEPHONE

A. The Contractor shall, before contract work begins, furnish to the Engineer telephone numbers at which company officers and/or responsible persons can be contacted at night, weekends and holidays in case of emergencies.

1.17 CONFLICT BETWEEN DRAWINGS AND SPECIFICATIONS

A. In case of the conflict between the drawings and the specifications, the Engineer shall be

the sole authority in determining which of the two shall take precedence in the Contract Documents. Such conflict shall not be a basis for an extra expense to the Parish.

B. The Contractor is hereby cautioned to base his/her price and work upon the costlier item in event of conflict as no claim for extra expense will be entertained on this basis.

1.18 INVOICING

A. Due to special funding of this project, the contractor will be required to submit its pay applications accordingly. Detail of this procedure will be discussed at the Pre-Construction meeting.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01015

CONTROL OF WORK

PART 1 - GENERAL

1.01 WORK PROGRESS

The Contractor shall furnish personnel and equipment which will be efficient, appropriate, and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the time stipulated in the Proposal. If at any time such personnel or equipment appears to the Engineer to be inefficient, inappropriate, or insufficient for securing the quality of work required for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character, or increase the personnel and equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.

1.02 PRIVATE LAND

The Contractor shall not enter or occupy private land outside of easements, except by permission of the Owner.

1.03 WORK LOCATIONS

Work shall be located substantially as indicated on the drawings, but the Engineer reserves the right to make such modifications in locations as may be found desirable to avoid interference with existing structures or for other reasons. Where fittings are noted on the drawings, such notation is for the Contractor's convenience and does not relieve him from laying and jointing different or additional items where required.

1.04 OPEN EXCAVATIONS

A. All open excavations shall be adequately safeguarded by providing temporary fences, barricades or caution signs, lights, coverings and other means to prevent accidents to persons, and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access to private property during construction shall be removed when no longer required. 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 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 barricaded and well lighted at all times when construction is not in progress.

1.05 DISTRIBUTION SYSTEMS AND SERVICES

A. The Contractor shall interrupt water, telephone, Cable TV, sewer, gas, or other related utility services and disrupt the normal functioning of the system as little as possible. He shall notify the Engineer well in advance of any requirement for dewatering, isolating, or relocating a section of a utility, so that necessary arrangements may be made with the appropriate agency.

B. If it appears that utility service will be interrupted for an extended period, the Engineer may order the Contractor to provide temporary service lines. Inconvenience of the users shall be the minimum, consistent with existing conditions. The safety and integrity of the system is of prime importance in scheduling work.

1.06 TEST-PITS

Test pits for the purpose of locating underground pipelines or structures in advance of the construction shall be excavated and backfilled by the Contractor prior to commencement of construction. 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. This work shall be considered incidental to the construction and no additional payment will be made for exploration.

1.07 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 his expense to a condition similar or equal to that existing before the damage was done, or he shall make good the damage in another manner acceptable to the Engineer.

B. Along the location of this work all fences, walks, brushes, trees, shrubbery, and other physical features shall be protected and restored in a thoroughly workmanlike manner. Fences and other features removed by the Contractor shall be replaced in the location indicated by the Engineer as soon as conditions permit. All grass areas beyond the limits of construction which have been damaged by the Contractor shall be re-graded and seeded.

C. Trees close to the work shall be boxed or otherwise protected against injury. The Contractor shall trim all branches that are liable to damage because of his operations, but in no case shall any tree be cut or removed without prior notification of the Engineer. All injuries to bark, trunk, limbs, and roots of trees shall be repaired by

dressing, cutting, and painting according to approved methods, using only approved tools and materials.

D. The protection, removal, and replacement of existing physical features along the line of work shall be a part of the work under the contract, and all costs in connection therewith shall be included in the lump sum price.

1.08 WATER FOR CONSTRUCTION PURPOSES

A. In locations where public water supply is available, the Contractor may purchase water for all construction purposes.

B. The express approval of the Tammany Utilities shall be obtained in writing. Hydrants shall only be operated under the supervision of the Tammany Utilities personnel. Contractor shall obtain a water meter from the Tammany Utilities and pay all fees involved with obtaining and using the public water supply.

1.09 MAINTENANCE OF FLOW

The Contractor shall, at his own cost, provide for the flow of sewers, drains, and water courses interrupted during the progress of the work, and shall immediately cart away and remove all offensive matter. The entire procedure of maintaining existing flow shall be fully discussed with the Engineer well in advance of the interruption of any flow.

1.10 CLEANUP

During the course of the work, the Contractor shall keep the site of his operations in as clean and neat a condition as is possible. He shall dispose of all residue resulting from the construction work and, at the conclusion of the work, he 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.

1.11 COOPERATION WITHIN THIS CONTRACT

A. All firms or persons authorized to perform any work under this contract shall cooperate with the General Contractor and his subcontractors or trades, and shall assist in incorporating the work of other trades where necessary or required.

B. Cutting and patching, drilling, and fitting shall be carried out where required by the trade or subcontractor having jurisdiction, unless otherwise indicated herein or directed by the Engineer.

1.12 PROTECTION OF CONSTRUCTION AND EQUIPMENT

A. All newly constructed work shall be carefully protected from damage in any way. No wheeling or walking or placing of heavy loads on it shall be allowed and all portions damaged shall be reconstructed by the Contractor at his own expense.

B. All structures shall be protected in a manner approved by the Engineer. If, in the final inspection of the work, any defects, faults, or omissions are found, the Contractor shall cause the same to be repaired or removed and replaced by proper materials and workmanship without extra compensation for the materials and labor required. Further, the Contractor shall be fully responsible for the satisfactory maintenance and repair of the construction and other work undertaken herein, for at least the guarantee period described in the contract.

1.13 MAINTENANCE OF HOUSE SERVICES

At all times continuous water and sewer service must be maintained to all house connections.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

A. Refer to "Louisiana Uniform Public Work Bid Form".

B. Payment shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies, and manufactured articles, and for all labors, operations, and incidentals appurtenant to complete the work being described, as necessary to complete the various items of the work all in accordance with the requirement of the Contract Documents, including all costs of compliance with the regulations of public agencies having jurisdiction. The Contractor is hereby on notice that no separate payment will be made for any item not specifically called out, but that is required to properly complete the project.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

PART 4 - MEASUREMENT AND PAYMENT

4.01 GENERAL

The total Bid Price shall cover all work required by the Contract Documents. All costs in connection with the proper and successful completion of the work, including furnishing all materials, sheeting, bracing, bedding, backfill equipment, supplies, and appurtenances; providing all construction equipment, and tools; performing all necessary labor and supervision to fully complete the work, shall be included in the lump sum bid price.

4.02 MEASUREMENT AND PAYMENT

The bid price for each bid item shall include all tools, equipment, supplies, and manufactured articles, and for all labors, operations, and incidentals appurtenant to complete the work as shown in the drawings and detailed in the contract documents. Prior to beginning construction, the Contractor shall provide a detailed itemized cost breakdown to be used for processing monthly payment applications.

4.03 MOBILIZATION & DEMOBILIZATION

All costs associated with mobilization and demobilization of the Contractor's operations, equipment, all items stated in paragraph 4.01 General, personnel, and those of his Subcontractors and other such costs as may be denoted in the Contract Documents for the project area shall be paid at the lump sum price for "MOBILIZATION & DEMOBILIZATION" in the Bid Schedule.

(1) A maximum of sixty percent (60%) of the lump sum price of this bid item shall be paid upon completion of the Contractor's mobilization at the work site.

(2) The remaining forty percent (40%) of the lump sum price of this bid item shall be paid upon completion of site clean-up and Contractor's demobilization from the site.

4.04 CONSTRUCTION LAYOUT

All costs connected with furnishing all labor, equipment and materials for performing all operations for construction layout at the site, video and photographic documents, construction surveys and staking, and other such costs as may be denoted in the Contract Documents for the project area shall be paid at the lump sum price for "CONSTRUCTION LAYOUT" in the Bid Schedule.

Construction Layout Payment Schedule

Percent of Total Contract Amount Earned	Allowable Percent of the Lump Sum Price for Construction Layout
1st Partial Estimate	10
50	50
75	75
100	100

4.05 TRAFFIC CONTROL

All costs connected with furnishing all signs, labor, equipment and materials for performing all operations of traffic control for the project shall be paid at the lump sum price for "TRAFFIC CONTROL" in the Bid Schedule.

Traffic Control Payment Schedule

Percent of Total Contract Amount Earned	Allowable Percent of the Lump Sum Price for Construction Layout
1st Partial Estimate	10
50	50
75	75
100	100

4.06 EXPLORATORY EXCAVATION

Measurement and Payment: The complete work will be measured and paid for at the contract Lump Sum Price per each site as shown on the drawings and in the Bid Form. Payment shall include all the costs associated with the work including, but not limited to, equipment, labor, material, excavation, backfill, compaction, dewatering, protection, shielding, supporting, restoration, traffic control, closures, and other appropriate work to complete the work and verify the locations and other necessary information about the existing utilities. Contractor shall assume up to two full (8 hour) days at each site to complete exploratory digging.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01026

SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 GENERAL

This Section defines the process whereby the Schedule of Values (lump sum price breakdown) shall be developed. Monthly progress payment amounts shall be determined from monthly progress updates of the Schedule activities.

1.02 SCHEDULE OF VALUES

A. The Contractor shall submit a Schedule of Values for all lump sum price items within 10 days from the date of Notice to Proceed. The listing shall include a price allocation for the major Work components.

B. The Contractor shall assign the price of work (a sum including allocation for materials, labor, equipment, overhead and profit) to each activity. Price per activity shall not exceed $30,000.00. Activities shall be grouped to identify the major work item to be performed. The sum of values for all activities listed shall equal the total Contract Lump Sum Price. The Contractor shall provide to the Engineer upon request, the Contractor's backup price information, including unit prices for excavation, backfill, concrete etc. Determining the total percentage of each activity installed for the month will develop the monthly progress payment.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 01041

PROJECT COORDINATION

PART 1 – GENERAL

1.01 SCOPE

This section covers the work required by the Contractor to coordinate and administer the project.

1.02 PROJECT COORDINATION

A. Contractor shall plan, schedule and coordinate with the Owner and Engineer all work to be performed on utilities and road closures in a manner conducive to timely and efficient progress in the execution of the contract.

B. Contractor shall coordinate with all utilities for permanent relocation(s), temporary relocations, new required facilities, new required service, facility upgrades and/or service upgrades.

1.03 NOTICES TO OWNERS AND AUTHORITIES

A. Contractor shall, as provided in General Conditions, notify owners of adjacent property and utilities when prosecution of the Work may affect them.

B. When it is necessary to temporarily deny access by owners or tenants to their property, or when any utility service connection must be interrupted, Contractor shall give notices sufficiently in advance to enable the affected persons to provide for their needs. Notices will conform to any applicable local ordinance and, whether delivered in writing, will include appropriate information concerning the interruption and instructions on how to limit their inconvenience.

C. All utilities and other concerned agencies shall be contacted at least 24 hours in advance, unless otherwise specified, prior to cutting or closing streets or other traffic areas, excavating near underground utilities or pole lines or temporary shutdown of existing facilities.

1. Notice to CLECO and/or Washington-St. Tammany Electric Co-op (WST). The Contractor shall review, prior to bidding, with CLECO and/or WST the construction methods to be used in the vicinity of power lines. This review shall establish which lines, if any, need temporary relocation or de-energizing and the cost to accomplish this work. At least two weeks notice is required from the Contractor by CLECO and/or WST prior to any temporary relocating or de-energizing work being required.

2. Notice to Gas Companies. The Contractor shall review with the Gas Company any work to be done in the vicinity of gas lines. Where temporary exposure or complete relocation of gas lines is required the Contractor shall meet with the Gas Company as soon as possible, but no less than thirty (30) days in advance of when work is required.
3. Notice to City and Parish Utilities. The Contractor shall review with the Tammany Utilities any work in the vicinity of existing water and sewer utilities and with the Department of Public Works concerning work in the vicinity of existing drain lines.
4. Contractor shall also coordinate and notify work in the vicinity of telephone and cable lines with AT&T and Charter/Spectrum Cable Company.
5. Notice to Tammany Utilities regarding. A one week notice is required for planning and coordinating a future active facility tie-in(s) and other work. Prior to the scheduled tie-in or work activity, a 72 hour notice will be required for any active facility shutdown(s) that will be required for all active force main or facility tie-in purposes. The Contractor shall anticipate this work being performed after normal working hours and shall be dependent of the number of facilities that require shut down(s) prior to commencing work. No destructive work shall proceed on an active facility until given approval and clearance by Tammany Utilities. The contractor shall have ample personnel, equipment, procedures and material readily available to accomplish the pre-approved task within the agreed upon duration.
6. The contractor shall coordinate all requests through Tammany Utilities for use of St. Tammany Parish Government facilities, materials or resources. The approval of all requests shall be solely at the discretion of the St. Tammany Parish Government. Direct coordination with St. Tammany Parish Government personnel will only be allowed during emergency situations. St. Tammany Parish Government and Tammany Utilities shall not be held responsible for any additional cost or delays as a result of a request denial, approval, or a failure to coordinate a request through the Tammany Utilities.

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

Contractor shall be responsible for all areas of the site used by him, and all subcontractors in the performance of the Work. He will exert full control over the actions of all employees and other persons with respect to the use and preservation of property and existing facilities, except such controls as may be specifically reserved to Owner or others. Contractor has the right to exclude from the site all persons who have no purpose related to the Work or its inspection, and may require all persons on the site to observe the same safety regulation as he required of his employees. At all working hours a superintendent shall be at the job on a full-time basis.

1.02 UNFAVORABLE CONSTRUCTION CONDITIONS

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

1.03 LAND FOR CONSTRUCTION PURPOSES

A. Contractor will be permitted to use available land belonging to Owner, on or near the site of the Work, for construction purposes and for the storage of materials and equipment. The location and extent of the areas so used shall be as indicated on the drawings or as directed by the Engineer. Contractor shall immediately move stored material or equipment if any occasion arises, as determined by Owner, requiring access to the storage area. 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. It shall be the Contractor's responsibility to provide arrangements for additional land required for construction or for location of the Resident Project Representative's office if applicable 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 included in the lump sum price for the applicable item.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 01045

CUTTING AND PATCHING

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Contractor shall be responsible for all cutting, fitting and patching, including attendant excavation and backfill, required to complete the work or to:

1. Make its several parts fit together properly.
2. Uncover portions of the work to provide for installation of ill-timed work.
3. Remove and replace defective work.
4. Remove and replace work not conforming to requirements of Contract Documents.

1.02 RELATED REQUIREMENTS

A. Section 01010: Summary of Work

B. Section 01046: Modifications to Existing Piping

C. Section 01600: Material and Equipment

D. Section 02220: Excavation, Backfill, Fill and Grading for Structures

1.03 SUBMITTALS

A. Submit a written request to Engineer well in advance of executing any cutting or alteration which affects:

1. Work of the owner or any separate contractor.
2. Structural value or integrity of any element of the project.

B. Request shall include:

1. Identification of the project.
2. Description of affected work.
3. The necessity for cutting, alteration or excavation.
4. Effect on work of Owner or any separate contractor, or on structural or weatherproof integrity of project.
5. Description of proposed work.
6. Alternatives to cutting and patching.
7. Cost proposal, when applicable.
8. Written permission of any separate contractor whose work will be affected.

C. Should conditions of work or the schedule indicate a change of products from original installation, Contractor shall submit request for substitution as specified in Section 01600.

D. Submit written notice to Engineer designating the date and the time the work will be uncovered.

PART 2 - PRODUCTS

2.01 MATERIALS

Comply with specifications and standards for each specific product involved.

PART 3 - EXECUTION

3.01 INSPECTION

A. Inspect existing conditions of project, including elements subject to damage or to movement during cutting and patching.

B. After uncovering work, inspect conditions installation of products, or performance of work.

C. Report unsatisfactory or questionable conditions to Engineer in writing; do not proceed with work until Engineer has provided further instructions.

3.02 PREPARATION

A. Provide adequate temporary support as necessary for structural value or integrity of affected portion of work.

B. Provide devices and methods to protect other portions of project from damage.

C. Provide protection from elements for that portion of the project which may be exposed by cutting and patching work, and maintain excavations free from water.

3.03 PERFORMANCE

A. Execute cutting and demolition by methods which will prevent damage to other work, and will provide proper surfaces to receive installation of repairs.

B. Execute excavating and backfilling by methods which will prevent settlement or damage to other work.

C. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.

D. Restore work which has been cut or removed; install new products to provide completed work in accord with requirements of Contract Documents.

E. Fit work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 01046

MODIFICATIONS TO EXISTING PIPING

PART 1 - GENERAL

1.01 SCOPE OF WORK

Furnish all labor, materials, equipment, and incidentals required to modify, alter and convert existing structures and piping as shown or specified and as required for the installation of new piping and appurtenances.

1.02 RELATED WORK

A. General and Supplementary Conditions of the contract.

B. Section 01045: Cutting and Patching.

C. Section 03300: Cast-in-Place Concrete.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

A. Prior to commencement of any work modifying existing structures, piping and equipment, an inspection shall be made by the Contractor and Engineer to determine if any existing piping or valves to be left in place are structurally and mechanically sound and in good working order. If it is determined that replacement is required, the items shall be replaced in accordance with the specifications.

B. Where necessary or required for the purpose of making connections, the Contractor shall cut existing pipe lines in a manner to provide an approved joint. Where required, he shall weld bends, install flanges, or provide approved couplings, all as required.

C. The Contractor shall provide flumes, hoses, piping, etc. to divert or provide suitable plugs, bulkheads, or other means to hold back the flow of wastewater, water, or other liquids, all as required in the performance of the work under this contract.

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 01050

FIELD ENGINEERING AND SURVEYING

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

Contractor shall provide and pay for field engineering and field surveying services required for the project.

A. Survey work required in execution of the project.

B. Civil, structural or other professional engineering services specified, or required to execute the Contractor's construction methods.

1.02 RELATED REQUIREMENTS

A. Conditions of the Contract.

B. Section 01010: Summary of Work.

1.03 QUALIFICATIONS OF SURVEYOR OR ENGINEER

Registered professional engineer of the discipline or registered land surveyor required for the specific service on the project, licensed in the State of Louisiana, acceptable to the owner.

1.04 SURVEY REFERENCE POINTS

A. Existing basic horizontal and vertical control points for the project are those designated on the drawings.

B. Locate and protect control points prior to starting work, and preserve all permanent reference points during construction.

1. Make no changes or relocations without prior written notice to the Engineer.
2. Report to the Engineer when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
3. Require surveyor to replace project control points which may be lost or destroyed.

    a. Establish replacements based on original survey control.

1.05 PROJECT SURVEY REQUIREMENTS

A. Establish temporary bench marks as needed, referenced to data established by survey control points. Record locations, with horizontal and vertical data, on Project Record Documents.

B. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means.

C. From time to time, verify layouts by same methods, as directed by the Engineer.

1.06 RECORDS

Maintain a complete, accurate log of all control and survey work as it progresses.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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, 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

Obtain copies of referenced standards direct from 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 345 East 47th Street New York, NY 10017
ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103
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
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
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

THIS PAGE IS INTENTIONALLY BLANK

SECTION 01152

REQUESTS FOR PAYMENT

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

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 and Video Taping.

D. Section 01700: Contract Closeout.

1.03 FORMAT AND DATA REQUIRED

A. Submit payment requests in the form required by owner with itemized data typed on 8 ½ x 11 white paper continuation sheets.

B. Provide itemized data on continuation sheet: format, schedules, line items and values.

1.04 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

A. All payment requests must be accompanied by a completed pay request checklist and must 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 project schedule and invoices for any stored materials billed. The pay request checklist form shall be as provided on page 01152-3. All items required on the checklist must be included with each pay request for the request to be considered.

B. When the Owner or the Engineer requires additional substantiating data, the Contractor shall submit suitable information, with a cover letter.

C. Submit one copy of all data required with a cover letter for each monthly pay request. Any additional substantiating data requested shall also be submitted as required in Part B above.

1.05 PREPARATION OF APPLICATION FOR FINAL PAYMENT

A. Fill in application form as specified for progress payments.

B. Use continuation sheet for presenting the final statement of accounting as specified in section 01700 - Contract Closeout.

1.06 SUBMITTAL PROCEDURE

A. Submit applications for payment to the Engineer at the times stipulated in the Agreement.

B. Number: One original and three copies of each application package.

C. When the Engineer finds application properly completed and correct, he will transmit certificate for payment to the owner, with copy to Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

PAY REQUEST CHECKLIST
(CONSTRUCTION CONTRACT)

PARTIAL PAY REQUEST:

Pre-Construction Video (Date Submitted): _____
Construction Schedule (Updated as needed) _____
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 PAY REQUEST:

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 that
he shall warranty the work for
one year following date of
Substantial Completion _____
Verification of Bond to Remain in
effect for one year from Final
Payment _____

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 01153

CHANGE ORDER PROCEDURES

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

A. Promptly implement change order procedures.

1. Provide full written data required to evaluate changes.
2. Maintain detailed records of work done on a time-and-material/force account basis.
3. Provide full documentation to Engineer on request.

B. Designate in writing the member of Contractor's organization.

1. Who is authorized to accept changes in the Work.
2. Who is responsible for informing others in the contractors employ of the authorization of changes in the Work.

C. Owner will designate in writing the person who is authorized to execute Change Orders.

1.02 DEFINITIONS

Change order: See General Conditions.

1.03 PRELIMINARY PROCEDURES

A. Owner or Engineer may initiate changes by submitting a Proposal Request to 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, nor to stop work in progress.

B. Contractor may initiate changes by submitting a written notice to Engineer, containing:

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.

1.04 DOCUMENTATION OF PROPOSALS AND CLAIMS

A. 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. On request, provide additional data to support time and cost computations:

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. Support each claim for additional costs, and for work done on a time-and-material/force account basis, with documentation as required for a lump-sum proposal, plus additional information.

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.

1.05 PREPARATION OF CHANGE ORDERS

A. Engineer will prepare each Change Order.

B. Form: Owner's Form, to be provided to the Contractor.

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

D. Change Order will provide an accounting of the adjustment in the Contract Sum and in the Contract Time.

1.06 LUMP SUM/FIXED PRICE CHANGE ORDER

A. Content of Change Orders will be based on, either:

1. Engineer's Proposal Request and contractor's responsive Proposal as mutually agreed between Owner and Contractor.
2. Contractor's Proposal for a change, as recommended by Engineer.

B. Owner and Engineer will sign and date the Change Order as authorization for the Contractor to proceed with the changes.

C. Contractor may sign and date the Change Order to indicate agreement with the terms therein.

D. Contractor and Subcontractors Overhead and Profit shall not exceed 15% on Direct Cost. Prime Contractor mark-up of subcontractors direct cost shall not exceed 10%. Performance and Payment Bond Shall not exceed 1% of Change Order sub-total.

E. Utilization of the St. Tammany Parish Government Construction Contract Change Order Form shall be required. St. Tammany Parish Government Construction Contract Change Order Form is included at the end of this specification.

1.07 UNIT PRICE CHANGE ORDER

A. Content of Change Orders will be based on, either:

1. Engineer's definition of the scope of the required changes.
2. Contractor's Proposal for a change, as recommended by Engineers.
3. Survey of completed work.

B. The amounts of the unit prices to be:

1. Those stated in the Agreement.
2. Those mutually agreed upon between Owner and Contractor.

C. When quantities of each of the items affected by the Change Order can be determined prior to start of the work:

1. Owner and Engineer will sign and date the Change Order as authorization for Contractor to proceed with the changes.
2. Contractor may sign and date the Change Order to indicate agreement with the terms therein.

D. When quantities of the items cannot be determined prior to start of the work:

1. Engineer or Owner will issue a construction change authorization directing Contractor to proceed with the change on the basis of unit prices, and will cite the applicable unit prices.
2. At completion of the change, Engineer will determine the cost of such work based on the unit prices and quantities used.
   a. Contractor shall submit documentation to establish the number of units of each item and any claims for a change in Contract Time.
3. Engineer will sign and date the Change Order to establish the change in Contract Sum and in Contract Time.
4. Owner and contractor will sign and date the change Order to indicate their agreement with the terms therein.
5. Unit Price Change Orders shall not be allowed Profit and Overhead.

1.08 CORRELATION WITH CONTRACTOR'S SUBMITTALS

A. Periodically revise Schedule of Values and Application for Payment forms to record each change as a separate item of work, and to record the adjusted Contract Sum.
B. Periodically revise the Construction Schedule to reflect each change in Contract Time.

1. Revise subschedules to show changes for other items of work affected by the changes.

C. Upon completion of work under a Change Order, enter pertinent changes in Record Documents.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 ST. TAMMANY PARISH GOVERNMENT CONSTRUCTION CONTRACT CHANGE ORDER FORM

A. Contractor shall be required to utilize the attached change order form for all additional contract work proposals.

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Engineer shall schedule and administer pre-construction meeting, periodic progress meetings, and specially called meetings throughout progress of the work. At a minimum, he shall perform the following duties:

1. Prepare agenda for meetings.
2. Distribute written notice of each meeting four days in advance of meeting date.
3. Make physical arrangements for meetings.
4. Preside at meetings.
5. Record the minutes; include significant proceedings and decisions.
6. Reproduce and distribute copies of minutes within three days after each meeting.

a. To participants in the meeting
b. To parties affected by decisions made at the meeting

B. Representative of contractors, subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

1.02 RELATED REQUIREMENTS

A. Instructions to Bidders: Pre-bid Conferences.
B. Section 01340: Shop Drawings, Product Data and Samples.

1.03 PRE-CONSTRUCTION MEETING

A. Schedule prior to issuance of Notice to Proceed.
B. Location: A central site, convenient for all parties, designated by the Engineer.
C. Attendance:

1. Owner's Representative.
2. Engineer and his professional consultants.
3. Resident Project Representative.
4. Contractor's Superintendent.
5. Major Subcontractors.
6. Major suppliers.
7. Others as appropriate.

D. Suggested Agenda:

1. Distribution and discussion of:

    a. List of major subcontractors and suppliers.
    b. Projected Construction Schedules.
    c. Values for progress payment purposes.

2. Critical work sequencing.
3. Major equipment deliveries and priorities.
4. Project Coordination:

    Designation of responsible personnel.

5. Procedures and processing of:

    a. Field decisions.
    b. Proposal requests.
    c. Submittals.
    d. Change Orders.
    e. Applications for Payment.

6. Adequacy of distribution of Contract Documents.
7. Procedures for maintaining Record Documents.
8. Use of premises:

    a. Office, work and storage areas.
    b. Owner's requirements.

9. Construction facilities, controls and construction aids.
10. Temporary utilities.
11. Safety and first-aid procedures.
12. Security procedures.
13. Housekeeping procedures.

1.04 PROGRESS MEETINGS

A. Schedule regular monthly meetings.

B. Hold called meetings to review progress of the work.

C. Location of the meetings: As designated by the Engineer.

D. Attendance:

1. Engineer, and his professional consultants, as needed.
2. Contractor.
3. Subcontractors, as appropriate to the agenda.

4. Suppliers, as appropriate to the agenda.
5. Others.

E. Suggested Agenda:

1. Review, approval of minutes of previous meeting.
2. Review of work progress since previous meeting.
3. Field observations, problems, conflicts.
4. Problems which impede Construction Schedule.
5. Review of off-site fabrication, delivery schedules.
6. Corrective measures and procedures to regain projected schedule.
7. Revisions to Construction Schedule.
8. Progress, schedule, during succeeding work period.
9. Coordination of schedules.
10. Review submittal schedules; expedite as required.
11. Maintenance of quality standards.
12. Pending changes and substitutions.
13. Review proposed changes for:

    a. Effect on Construction Schedule and on completion date.
    b. Effect on other contracts of the project.

14. Other business.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 01310

CONSTRUCTION SCHEDULING

PART 1 – GENERAL

1.01 PROGRAM DESCRIPTION

A. A Critical Path Method (CPM) construction schedule shall be used to control the work of this Contract and to provide a definitive basis for determining job progress. The construction schedule shall be prepared, maintained, and updated by the Contractor. The construction schedule shall be reviewed by the Engineer as described herein. All work shall be done in accordance with the established CPM schedule and the Contractor and his/her subcontractors shall be responsible for cooperating fully with the Engineer and the Owner in effectively utilizing the CPM schedule. It is suggested that Primavera Project Planner, Version 1.0 (or latest) for Windows shall be the software used for the CPM construction schedule.

B. The CPM schedule to be prepared and submitted by the Contractor shall consist of a CPM network (diagram of activities) in the Time Scale Logic and a computer-generated schedule (print-out) as specified herein.

C. Within ten calendar days following written Notice to Proceed, the Contractor shall submit to the Engineer for review and approval a Preliminary Guideline CPM Schedule covering the first 60 calendar days of Work to be performed.

D. The Preliminary Guideline CPM Schedule shall:

1. Illustrate a feasible CPM schedule for completion of the work under this Contract within the time specified.

2. Provide an elementary example of a CPM schedule in the format to be used for the detailed CPM schedule specified. The Preliminary Guideline CPM Schedule is not as detailed as the CPM schedule required under this Contract.

3. Establish mandatory milestone dates. Designate milestones on the Preliminary Guideline CPM Schedule with asterisks.

E. The Preliminary Guideline CPM Schedule is not to be considered binding except for the time required for contract completion and the mandatory milestones.

F. Contractor shall develop his own outline of the Work and prepare his proposed CPM schedule. The computer-based schedule shall be the product of a recognized commercial computer software producer and shall meet all of the requirements

defined herein.

1.02 QUALIFICATIONS

A. Have the capability of preparing and utilizing the specified CPM scheduling technique. A statement of CPM capability shall be submitted in writing to the Engineer within ten calendar days after the award of the Contract and will verify that either the Contractor's organization has in-house capability qualified to use the technique or that the Contractor employs a consultant who is so qualified. Capability shall be verified by description of the construction projects to which the Contractor or his/her consultant has successfully applied the CPM scheduling technique and which were controlled throughout the duration of the project by means of systematic use and updating of a computer-based CPM schedule. The submittal shall include the name of the individual on the Contractor's staff who will be responsible for the CPM schedule and for providing the required updating information.

1.03 NETWORK REQUIREMENTS

A. The network shall show the order and inter-dependence of activities and the sequence in which the work is to be accomplished as planned by the Contractor. The basic concept of a network analysis diagram shall be followed to show how the start of a given activity is dependent on the completion of preceding activities and its completion restricts the start of following activities.

B. Detailed network activities shall include: construction activities, the submittal and approval of samples of materials and shop drawings, the procurement of materials and equipment, fabrication of materials and equipment and their delivery, installation and testing, start-up and training. Break the work into activities with duration no longer than 20 working days each, except as to non-construction activities (such as procurement of materials and delivery of equipment) and any other activities for which the Engineer may approve the showing of longer duration. To the extent feasible, activities related to a specific physical area of the work shall be grouped on the network for ease of understanding and simplification.

C. Separate activities shall be provided for each significant identifiable function in each trade area in each facility. Activities shall be so identified that there will be no reasonable doubt as to how much work remains on each. Specific activities which shall be included are: all sub contract work, all interface work between subcontractors and between the Contractor and subcontractors leakage tests of tanks and pipelines, electrical connections to each item of equipment, supplier and manufacturer technical assistance, mechanical connections to each item of equipment all tests concrete finishing, each item of site work, (including restraints on other activities) and all utilities, fuels and chemicals.

D. Each activity on the network shall have the following indicated on the node representing it.

1. A single duration (i.e., the single best estimate of elapsed time considering the scope of the work involved in the activity and the resources planned for accomplishing the activity) expressed in working days.

2. A five character (or less) code indicative of the party responsible for accomplishing the activity.

3. A cost estimate for each activity which, when accumulated with the cost of all activities, equals the total contract cost. Estimated overhead and profit shall be prorated throughout all activities. Materials costs shall be assigned to delivery activities.

4. A brief description of the activity.

5. Manpower estimate for each activity.

E. The selection and number of activities shall be subject to the Engineer's approval. The detailed network shall be time scaled. In addition to the brief description, submit a separate list of all activities containing a detailed narrative of the scope of each activity, including the trades and subcontractors involved, the activity duration, and the cost of each activity as it pertains to the pay items on the Schedule of Values.

F. To the extent that the network or any revision thereof shows anything not jointly agreed upon or fails to show anything jointly agreed upon, it shall not be deemed to have been approved by the Engineer. Failure to include on a network any element of work required for the performance of this Contract shall not excuse the Contractor from completing all work required within any applicable completion date, notwithstanding the review of the network by the Engineer.

G. Except where earlier completions are specified, CPM schedules which show completion of all work prior to the contractor completion date may be approved by the Engineer but in no event shall they be acceptable as a basis for claim for delay against the Owner or Engineer by the Contractor.

1.04 COMPUTER-GENERATED SCHEDULE REQUIREMENTS

A. Each computer-generated schedule submittal from the CPM activity network shall include the following tabulations: a list of activities in numerical order, a list of activity precedence's, a schedule sequenced by Early Start Date and a schedule sequenced by Total Float. Each schedule shall include the following minimum items:

1. Activity numbers

2. Estimated duration

3. Activity description
4. Early start date (calendar dated)

5. Early finish date (calendar dated)

6. Latest allowable start date (calendar dated)

7. Latest allowable finish date (calendar dated)

8. Status (whether critical)

9. Estimated cost of the activity

10. Total float and free float

B. In addition, each schedule shall be prefaced with the following summary data:

1. Contract name and number

2. Contractor's name

3. Contract duration

4. Contract schedule

5. The effective or starting date of the schedule (the date indicated in the Notice to Proceed).

C. The work day to calendar date correlation shall be based on an 8-hour day and 40-hour week with adequate allowance for holidays, adverse weather and all other special requirements of the work.

1.05 INITIAL CONFERENCE

A. Within ten days following the receipt of the Notice to Proceed, meet with the Engineer to discuss and agree on the proposed standards for the CPM schedule. At this conference submit to the Engineer a preliminary network defining the planned operations during the first 60 calendar days after Notice to Proceed. The general approach for the balance of the project shall be indicated. Cost of activities expected to be completed or partially completed before submission and approval of the complete network shall be included.

1.06 APPROVED CPM SCHEDULE

A. Within 45 days following the receipt of the Notice to Proceed, submit two prints of the proposed CPM activity network and a computer- generated schedule to the Engineer. Following review by the Engineer and Owner, the Contractor shall incorporate the Engineer's continents into the network and submit five prints and two reproducible of the revised network and two copies of the computer-generated schedule. This final submittal shall be delivered to the Engineer within 60 days after the Notice to Proceed.

B. CPM schedules which contain activities showing negative float or which extend beyond the contract completion date in the computer-generated schedule will not be approved.

C. The Contractor shall participate in the initial review and evaluation of the proposed network diagram and schedule by the Engineer. The approved network shall then be approved CPM schedule to be used for planning, organizing and directing the work, and reporting progress.

D. Approval of the CPM activity network by the Engineer is advisory only and shall not relieve the Contractor of responsibility for accomplishing the work within the contract completion date. Omissions and errors in the approved CPM schedule shall not excuse performance less than that required by the Contract Approval by the Engineer in no way makes the Engineer an insurer of the CPM schedule's success or liable for time or cost overruns flowing from its shortcomings. The Owner hereby disclaims any obligation or liability by reason of approval by its agent, the Engineer, of the CPM schedule.

E. The CPM activity network shall be prepared in accordance with the format used in the Preliminary Guideline CPM Schedule noted above. The network shall be submitted on sheets 24-in by 36-in and may be divided into as many separate sheets as required.

1.07 PROGRESS REPORTING

A. Progress under the approved CPM schedule shall be evaluated monthly by the Contractor and the Engineer. Not less than seven days prior to each monthly progress meeting, they shall meet at the job-site and jointly evaluate the status of each activity on which work has started or is due to start, based on the preceding CPM schedule; to show actual progress, to identify those activities started and those completed during the previous period, to show the estimated time required to complete or the percent complete of each activity started but not yet completed and to reflect any changes indicated for the network. Activities shall not be considered to be complete until they are, in fact, 100 percent complete.

B. At each progress meeting, submit a narrative report based on the CPM schedule evaluation described above, in a format agreed upon by the Contractor and the Engineer. The report shall include a description of the progress during the previous period in terms of completed activities, and explanation of each activity which is showing a delay, a description of problem areas, current and anticipated delaying factors and their estimated impact on performance of other activities and completion dates and an explanation of corrective action taken or proposed. This report, as well as the CPM Status Report, will be discussed at each progress meeting.

1.08 RESPONSIBILITY FOR SCHEDULE COMPLIANCE

A. Whenever it becomes apparent from the current CPM schedule and CPM Status Report that delays to the critical path have resulted and the contract completion date will not be met, or when so directed by the Engineer, Contractor shall take some or all of the following actions at no additional cost to the Owner. He shall submit to the Engineer for approval, a written statement of the steps intended to take to remove or arrest the delay to the critical path in the approved schedule.

1. Increase construction manpower in such quantities and crafts as will substantially eliminate the backlog of work.

2. Increase the number of working hours per shift, shifts per day, working days per week, the amount of construction equipment, or any combination of the foregoing, sufficiently to substantially eliminate the backlog of work.

3. Reschedule activities to achieve maximum practical concurrence of accomplishment of activities and comply with the revised schedule.

B. If when so requested by the Engineer, failure to submit a written statement of the steps intended to take or should fail to take such steps as approved by the Engineer, the Engineer may direct the Contractor to increase the level of effort in man-power (trades), equipment and work schedule (overtime, weekend and holiday work, etc) to be employed by the Contractor in order to remove or arrest the delay to the critical path in the approved schedule and the Contractor shall promptly provide such level of effort at no additional cost to the Owner.

1.09 ADJUSTMENT OF CONTRACT SCHEDULE AND COMPLETION TIME

A. If the Contractor desires to make changes in his/her method of operating which affect the approved CPM schedule, he/she shall notify the Engineer in writing stating what changes are proposed and the reason for the change. If the Engineer approves these changes, the Contractor shall review and submit for approval, without additional cost to the Owner, all of the affected portions of the CPM

network. The CPM schedule shall be adjusted by the Contractor only after prior approval of his/her proposed changes by the Engineer. Adjustments may consist of changing portions of the activity sequence, activity durations, division of approved activities, or other adjustments as maybe approved by the Engineer. The addition of extraneous, non-working activities and activities which add unapproved restraints to the CPM schedule shall not be approved.

B. If the completion of any activity, whether or not critical, falls more than 100 percent behind its approved duration, submit for approval a schedule adjustment showing each such activity divided into two activities reflection completed versus uncompleted work.

C. Shop drawings which are not approved on the first submittal or within the schedule time and equipment which do not pass the specified tests shall be immediately rescheduled.

D. The contract completion time will be adjusted only for causes specified in this Contract. In the event the Contractor requests an extension of any contract completion date, he/she shall furnish such justification and supporting evidence as the Engineer may deem necessary to determine whether the Contractor is entitled to an extension of time under the provisions of this Contract. The Engineer will after receipt of such justification and supporting evidence, make findings offset and will advise the Contractor in writing thereof. If the Engineer finds that the Contractor is entitled to any extension of any contract completion date, the Engineer's determination as to the total number of days extension shall be based upon the currently approved CPM schedule and on all data relevant to the extension. Such data shall be included in the next updating of the schedule. Actual delays in activities which, according to the CPM schedule, do not affect any contract completion date shown by the critical path in the network will not be the basis for a change therein.

E. Each request for change in any contract completion date shall be submitted by the Contractor to the Engineer within 30 days after the beginning of the delay for which a time extension is requested but before the date of final payment under this Contract. No time extension will be granted for requests which are not submitted within the foregoing time limit.

1. From time to time it may be necessary for the contract schedule or completion time to be adjusted by the Owner to reflect the effects of job conditions, weather, technical difficulties, strikes, unavoidable delays on the part of the Owner or its representatives and other unforeseeable conditions which may indicate schedule adjustments or completion time extensions. Under such conditions, the Engineer will direct the Contractor to reschedule the work or contract completion time to reflect the changed conditions and the Contractor shall revise his/her schedule accordingly. No additional compensation will be made to the Contractor for such

schedule changes except for unavoidable overall contract time extensions beyond the actual completion of all unaffected work, in which case the Contractor shall take all possible action to minimize any time extension and any additional cost to the Owner. Available float time in the CPM schedule may be used by the Owner as defined by the Engineer, as well as by the Contractor.

F. The Owner controls the float time in the approved CPM network and, therefore, without obligation to extend either the overall completion date or any intermediate completion dates set out in the CPM network, the Owner may initiate changes to the work that absorb float time only. Owner initiated changes that affect the critical path on the approved CPM network shall be the sole grounds for extending (or contracting) said completion dates. Contractor-initiated changes that encroach on the float time identified in the approved CPM network may be accomplished with the Owner's concurrence. Such changes, however, shall give way to Owner-initiated changes competing for the same float time.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 01335

SITE CONDITIONS SURVEY

PART 1 - GENERAL

1.01 RELATED WORK

Section 01380: Construction Photography and Video Taping

1.02 DESCRIPTION

A. Contractor shall conduct a thorough survey of the entire job. This survey should be adequate as to ascertain pre-construction and post-construction conditions (including elevations) of all public and private property within and adjacent to the construction limits. The Contractor shall provide sufficient video, still photographs, slab elevations and/or written documentation of the project route. Sufficient photographs and video shall be provided by the Contractor and submitted to the Engineer to resolve any damage claims which may arise due to the construction of this project. All videos shall be made in accordance with Section 01380. Elevations on abutting drives and walks shall be taken at approximately 20-foot intervals and at the point of juncture with any structure to which they are attached.

B. All photographs, video tapes and survey data shall be submitted to the Engineer for record purposes prior to, but not more than seven weeks before, commencement of any construction activities. All videos, photographs, and written records shall become the property of the Owner upon payment for work.

C. On horizontal directional drilling (HDD) projects, the Contractor shall provide a video inspection of all existing gravity sewer and storm drain lines that the HDD route crosses prior to and upon completion of construction (cleaning of these lines may be required). The pre-construction video must be presented to the Owner, reviewed and accepted prior to commencing construction. If in the opinion of the Owner, any of these lines have been damaged by HDD construction, the Contractor will be required to perform a 16 ft. long "point repair" of the damaged line at no additional cost to the Owner. Cost for pipe inspection shall be absorbed in the project cost.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01340

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

Submit shop drawings, product data and samples required by Contract Documents.

1.02 RELATED REQUIREMENTS

A. Conditions of the Contract: Definitions and Additional responsibilities of parties.

B. Designate in a separate schedule, the dates for submission and the dates that reviewed shop drawings, product data and samples will be needed.

1.03 SHOP DRAWINGS

A. Drawings shall be presented in a clear and thorough manner.

1) Details shall be identified by reference to sheet and detail as shown on contract drawings.

B. Minimum sheet size: 8 1/2 inches by 11 inches.

1.04 PRODUCT DATA

A. Preparation

1) Clearly mark each copy to identify pertinent products or models.
2) Show performance characteristics and capacities.
3) Show dimensions and clearances required.
4) Show wiring or piping diagrams and controls.

B. Manufacturer's standard schematic drawings and diagrams.

1) Modify drawings and diagrams to delete information which is not applicable to the work.
2) Supplement standard information to provide information specifically applicable to the work.

1.05 SAMPLES

A. Office samples shall be of sufficient size and quantity to clearly illustrate:

1) Functional characteristics of the product, with integrally related parts and attachment devices.
2) Full range of color, texture and pattern.

1.06 CONTRACTOR RESPONSIBILITIES

A. Review shop drawings, product data and samples prior to submission.

B. Determine and verify:

1) Field measurements
2) Field construction criteria
3) Catalog numbers and similar data
4) Conformance with specifications
5) Confirm compatibility of equipment to be supplied within location to be erected.
6.) Confirm and Certify American Iron and Steel Compliance

C. Coordinate each submittal with requirements of the work and of the contract documents.

D. Notify the Engineer in writing, at time of submission, of any deviations in the submittals from requirements of the contract documents.

E. Begin no fabrication or work which requires submittals until return of submittals with Engineer approval.

1.07 SUBMISSION REQUIREMENTS

A. Make submittals promptly in accordance with approved schedule, and in such sequence as to cause no delay in the work or in the work of any other contractor.

B. Number of Submittals required:

1) Shop Drawings and Product Data: Submit one (1) set of reproducibles and two (2) sets of prints of each shop drawing submittal for review. After final review in which there are no exceptions noted or referenced the contractor shall furnish the Engineer six (6) complete sets for use by the Engineer and Owner.
2) Samples: Submit the number stated in each specification section.

C. Submittals shall contain:

1) The date of submission and the dates of any previous submissions.
2) The project title and number.
3) Contract identification.
4) The names of:

(a) Contractor
(b) Supplier
(c) Manufacturer

5) Identification of the product, with the specification section number.
6) Field dimensions, clearly identified as such.
7) Relation to adjacent or critical features of the work or materials.
8) Applicable standards, such as ASTM or Federal specification numbers.
9) Identification of deviations from Contract Documents
10) Manufacturers American Iron and Steel Certification Letter.
10) Identification of revisions on resubmittals.
11) A blank space for Contractor and Engineer stamps.
12) Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the work and of Contract Documents.

D. Submittals should be made using the Letter of Transmittal form attached to this section as page 01340-6. Submittals received without this submittal form will be returned to the Contractor without action. Transmittals shall be numbered in sequence for each Section of the Specifications. The number after the dash indicates the Section of the Specifications, and the number before the dash is the sequence number of the transmittal (1-15100 would be the first transmittal applicable to Section 15100 of the Specifications. 2-15100 would be the second transmittal for Section 15100, etc.)

E. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a shop drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor for such charges, unless the need for such change is beyond the control of the Contractor.

1.08 RESUBMISSION REQUIREMENTS

A. Make any corrections or changes in the submittals required by the Engineer and resubmit until no exceptions are taken by the Engineer.

B. Shop Drawings and Product Data:

1) Revise initial drawings or data, and resubmit as specified for the initial submittal.
2) Indicate any changes which have been made other than those requested by the Engineer.

C. Samples: Submit new samples as required for initial submittal.

1.09 DISTRIBUTION

A. Distribute reproductions of Shop Drawings and copies of Product Data which carry the Engineer review stamp to:

1) Job site file
2) Record Documents file
3) Other affected contractors
4) Subcontractors
5) Supplier or Fabricator

B. Distribute samples which carry the Engineer review stamp as directed by the Engineer.

1.10 ENGINEER DUTIES

A. Engineer will provide a timely review of shop drawings and samples in accordance with the schedule of submittals acceptable to the Engineer. Engineers review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation into the work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed project as a functioning whole as indicated by the Contract Documents.

B. Affix review stamp and initials or signature, and indicate requirements, if any, for resubmittal.

C. Return submittals to Contractor.

1.11 ENGINEER'S ACTION

A. Final unrestricted release. Work may proceed, provided it complies with contract documents, when submittal is returned with the following:

Marking: No exceptions taken

B. Final-But-Restricted Release. Work may proceed, provided it complies with notations and corrections on submittal and with contract documents, when submittal is returned with the following:

Marking: Revised as Noted.

C. Returned for Resubmittal. Do not proceed with work. Revise submittal in accordance with notations thereon, and resubmit without delay to obtain a different action marking. Do not allow submittals with the following marking (or unmarked submittals where a marking is required) to be used in connection with performance of the work:

Marking: Amend and Resubmit or

Rejected - See Remarks

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

LETTER OF TRANSMITTAL

Transmittal of	☐ New Transmittal ☐ Re-Submittal
Project: CROSS GATES WATER DISTRIBUTION – HERWIG BLUFF	
TO: St. Tammany Parish Government 620 N Tyler Street Covington, LA 70433 From:	Transmittal No. (If Any) Previous Transmittal No.

Item No.	Description of Item Submitted, i.e., Type, Size, Model No., Etc.'	Mfg. or Supplier	Mfg. or Contr. Cat., Curve, Drawing or Brochure No.	No. of Copies	Project Specification Section Number	Engineer's Use Only Action Code

Signature of Contractor:_____ Date:_____

(THIS SECTION TO BE USED ONLY BY THE ENGINEER TO DESIGNATE ACTION)

Action Codes. The following codes are given to the items submitted: A - No exceptions taken; B - Revise as noted; C - Amend and resubmit; D - Rejected. See remarks. Corrections and comments made on the shop drawings during this review do not relieve the contractor from compliance with requirements of the drawings and specifications.

Enclosure Returned
(List by Item No.)

By:_____ Date:_____
St. Tammany Parish Government – Tammany Utilities

Distribution Requested: Contractor_____ Engineer_____ Owner_____

SECTION 01380

CONSTRUCTION PHOTOGRAPHS AND VIDEOS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

Contractor shall employ a competent photographer to take construction record photographs and video DVDs prior to and periodically during course of the work.

1.02 PHOTOGRAPHY REQUIRED

A. Video Survey as specified herein (pre-construction).

B. Provide six (6) photographs each month of each major portion of the work taken at each major stage of construction.

C. Provide digital files of each photograph identified with contract number, description of view and date.

1.03 COSTS OF PHOTOGRAPHY

Contractor shall pay costs for specified video and photography, and prints. Parties requiring additional photography or prints will pay photographer directly.

PART 2 - PRODUCTS

2.01 PRINTS

A. Color:

1. Paper: 20lb Bond Paper.
2. Print Size: 3 ½ in. x 5 in.
3. Each picture will be date stamped.
3. Prints: 1 column and 2 rows of pictures per sheet.

B. Identify each print by caption below the picture, listing:

1. Project Subject / Item.
2. Location / Station.
3. Direction of view.

2.02 VIDEOS

A. Specifications for Audio-Video Survey

Prior to the start of construction of the contract, the Contractor shall furnish to the Engineer the Preconstruction video DVDs that will include the construction areas and other areas as designated by the Project Engineer.

If the project is near any structures, then additional preconstruction video maybe required as directed by the Project Engineer. This will include at a minimum: pavements, sidewalks, yards, driveways, walkways and fronts facades of residences/businesses along the project site. In addition, if properties are near the site, views shall include from behind the curb, the sidewalk and grass areas, driveways and the fronts of the residences. Side and rear views of the exterior of the residence, along with the interior of all structures adjacent to project, shall also be videoed. Interior videos shall run along the corners of each room of the subject structure. Views shall also clearly show any existing damage prior to the commencement of work. The Contractor shall also supply the Engineer with signatures of any resident not allowing the internal/external survey of existing residential structures on an appropriate form.

The Pre Construction DVDs shall be reviewed by the Engineer and either approved or additional coverage will be required to fully show the physical conditions of the work areas. The Contractor shall have the additional coverage videoed and shall not begin work, including moving equipment and/or material on the project site, until the audio-video survey has been approved by the Engineer. After approval, the Contractor shall supply two copies of the audio-video survey to the Engineer. One copy of the DVDs will remain available for viewing by the Contractor and may be reviewed by him for any assistance that the DVDs may provide in resolving disputes which arise with the property owners claiming improper restoration of their properties or Parish owned features and items. The copy of the DVDs 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 damages attributable to the Contractor's work. The remaining copy of the DVD will be delivered to the Owner.

B. Technical Requirements

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 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.

C. Video Recorder

The recorder shall be DVD format.

D. Camera

The color video camera shall have a horizontal resolution of at least 550 lines at center and 4 megapixels.

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. Consult with Engineer at each period of photography for instructions concerning views required.

B. Prior to construction, six photographs of pertinent features shall be taken at various locations at the site as selected by the Engineer 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 progress payment.

3.03 TECHNIQUE AND VIEWS REQUIRED FOR VIDEO TAPING

A. At the start of production, 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) DVD 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.

B. Coverage

The 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 500 feet of the work site and (2) areas directed by the Owner. The coverage shall be continuous (i.e., the camera shall not be turned off once photography has begun) to the

greatest extent practically possible. If the camera must be turned off then a verbal message shall be inserted stating that the camera will be turned off and the reason for discontinuing coverage.

C. Visibility

No recording shall be done during periods of significant precipitation, mist or fog. The recording shall only be done when sufficient sunlight is present to properly illuminate the subjects of recording. Zooming and panning shall be slow and deliberate.

D. Experience

The operator in charge must have had previous experience video documenting a minimum of fifty miles of pre-construction work. Any apprentice operators must be continuously supervised by an above-described experienced operator.

3.04 DELIVERY OF PHOTOGRAPHS AND PRINTS

A. Preconstruction photographs shall be delivered to the Engineer prior to the mobilization of any equipment or materials or 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. In addition, any and 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 Owner's Project Engineer at the completion of the project or as directed by the Owners Project Engineer or Representative.

C. Deliver progress prints to Engineer to accompany each Application for Payment.

3.05 DELIVERY OF DVDs

A. Recording Schedule

The 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.

B. DVD Indexing

All DVDs and their storage cases shall be properly identified by DVD index number, project title and general project location. Displayed on the storage case of each DVD shall be a log of that DVD's contents. That log shall describe (1) the various segments

contained on that DVD, (2) coverage start, direction and endpoints, with corresponding DVD player counter numbers. A cumulative index correlating the various segments of coverage to their corresponding DVDs shall be typed and supplied to the Owner.

C. After approval of videos, deliver two record copies to Engineer.

D. Unacceptable Documentation

The Owner shall have the authority to reject all or any portion of the DVD documentation not conforming to the specifications. Those rejected portions shall be re-taped at no additional cost to the Owner.

E. Specification Deviations

Any deviation from these specifications must have the written approval of the Owner/Engineer.

F. Payment

There will be no separate payment for construction photographs and videos. Payment for the work covered under this section shall be included within the pay item for mobilization and demobilization. Video documentation will be made in accordance with the project specifications.

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 01390

EXCAVATION PLAN

PART 1 - GENERAL

1.01 SUBMITTALS

Prior to beginning excavation operations on the project, the Contractor shall submit in writing to the Engineer his proposed plan to comply with the requirements of this section and other applicable sections of the contract documents. The excavation plan shall be stamped and certified by a Professional Engineer registered in the state of Louisiana. Any subsequent deviation from the approved plan or amendments thereto must have the prior approval of the Engineer.

1.02 SAFETY REQUIREMENTS

The methods and operation outlined in the excavation plan shall comply with all local codes and laws, and authorities having jurisdiction.

PART 2 - PRODUCTS

2.01 GEOTECHNICAL REPORTS

The contractor may request any available geotechnical reports, borings or data from the Engineer or Owner prior to bidding. This information shall be subject to the terms outlined in the Instructions to Bidders, Section 6. The Owner, Engineer or their representative shall not be held responsible for variances in supplied data and actual filed conditions.

Prior to bidding, the contractor may request for permission to conduct a soil boring at no cost to the Owner, Engineer or their representatives. This request shall be made in writing to the owner and directed to Project Engineer. The Owner or any Owner designated representative shall not be held responsible for any delays or cost in relation to contractor requested pre-bid soil borings.

PART 3 - EXECUTION

The Contractor shall submit his proposed method of construction which shall include the methods for excavating, protection of existing utilities, dewatering, sheeting, shoring and bracing, and backfilling which he plans on using to perform the work included in the contract documents. A plan is required for the launching and receiving pits for horizontal directional drilling. All braced excavations shall be designed by using the wet soil densities shown on the boring log unless the Contractor can reasonably prove that he can

supply an effective dewatering system which will dry and maintain the soil in a "moist" condition even during periods of wet weather. The plan shall include but not be limited to:

1. Type of major excavation equipment.
2. Sheeting, shoring and bracing plan per Section 02160.
3. Dewatering plan per Section 02140.
4. Hauling equipment, and proposed excavation quantities.
5. Proposed haul routes of excavation and material supply equipment
6. Handling and storage of materials on site.
7. Provisions for compliance with permits and regulations.

The Contractor shall include in his plan a section describing aspects of the project where a modification of the proposed plan will occur due to field conditions. This shall include a detailed explanation of the methods of construction which he plans to use in specific areas or as required by the Engineer. The Contractor shall have the excavation plan stamped and certified by a Professional Engineer registered in the state of Louisiana.

The Contractor shall submit to the Engineer a design of the sheet pile and dewatering systems to be used in the launching and receiving pits for horizontal directional drilling. The design shall also include a detailed plan for the sequence of dewatering operations as related to the progress of the excavation.

The Contractor shall revise his plan when the Contractor's construction operation being used on the project changes materially from the original submittal or as required by the Engineer.

END OF SECTION

SECTION 01410

TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

Contractor shall employ and pay for the services of an independent testing laboratory to perform specified testing upon recommendation of the Engineer at no direct pay.

A. The Contractor shall cooperate with the laboratory to facilitate the execution of its required services.

B. Employment of the laboratory shall in no way relieve the Contractor's obligations to perform the work of the contract.

1.02 RELATED REQUIREMENTS

A. Conditions of the contract: Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities.
B. Respective sections of Specifications: Certification of products.

1.03 LABORATORY DUTIES

A. Cooperate with the Engineer and Contractor to provide certified personnel after due notice.
B. Perform specified inspections, sampling and testing of materials and methods of construction:

1. Comply with specified standards.
2. Ascertain compliance of materials with requirements of Contract Documents.

C. Promptly notify the Engineer and Contractor of observed irregularities or deficiencies of work or products.

D. Promptly submit two (2) copies of written report of each test and inspection to the Engineer, four (4) copies to the owner and two (2) copies to the Contractor. Each report shall include:

1. Date issued.
2. Project title and number.
3. Testing laboratory name, address and telephone number.
4. Name and signature of laboratory inspector.
5. Date and time of sampling or inspection.
6. Record of temperature and weather conditions.

7. Date of test.
8. Identification of product and specification section.
9. Location of sample or test in the project.
10. Type of inspection or test.
11. Results of test and compliance with Contract Documents.
12. Interpretation of test results, when requested by the Engineer.

E. Perform additional tests as required by the Engineer or Owner.

1.04 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

Laboratory is not authorized to:

A. Release, revoke, alter or enlarge on requirements of Contract Documents.

B. Approve or accept any portion of the work.

C. Perform any duties of the Contractor.

1.05 CONTRACTOR'S RESPONSIBILITIES

A. Cooperate with laboratory personnel; provide access to work, and to manufacturer's operations.

B. Secure and deliver to the laboratory, when requested by the 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 products test reports as required.

E. Furnish incidental labor and facilities:

1. To provide access to work to be tested.
2. To obtain and handle samples at the project site or at the source of the product to be tested.
3. To facilitate inspections and tests.
4. For storage and curing of test samples.

F. 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 the Owner for laboratory personnel time and travel expenses incurred due to Contractor's negligence.

G. Make arrangements with the laboratory and pay for additional samples and tests required for Contractors convenience.

H. Contractor to pay for all retesting as a result of test failure.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 01505

MOBILIZATION

PART 1 - GENERAL

Under this item of work, the Contractor shall set up his necessary general plant including shops, 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. The Contractor shall provide all items of work covered in this section which shall include but not be limited to the following principal items:

A. Moving on the site of all Contractor's plant and equipment required for first month operations.

B. Installing temporary construction power, wiring, and lighting facilities.

C. Developing construction water supply.

D. Providing on-site sanitary facilities and potable water facilities as specified.

E. Arranging for and erection of Contractor's work and storage yard.

F. Procurement and submittal of all required subcontractor insurance certificates and bonds.

G. Obtaining all required permits.

H. Posting all OSHA required notices and other information as required by Federal, State and Local Agencies. Establishment of safety programs.

I. Have the contractor's superintendent at the job site full time.

J. Have provided a detailed construction schedule acceptable to the Owner for project use as specified.

K. Erection of project sign(s) as specified.

L. Excavation Plan.

M. Provide Pre-construction videos.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 01510

TEMPORARY UTILITIES

PART 1 - GENERAL

1.01 SCOPE OF WORK

It shall be the Contractor's responsibility to provide plant and equipment that is adequate for the performance of the work under this contract within the time specified. All plant and 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. In addition, all work shall conform with requirements of the National Electric Code and other requirements specified in the Electrical Specifications.

1.02 RELATED REQUIREMENTS

Section 01010: Summary of Work

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 POWER AND LIGHTING

A. Power. The Contractor shall provide, at his own expense, all necessary power required for the 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 insure 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 St. Tammany Parish Government and the power company representative, and shall be removed in like manner at the Contractor's expense prior to final acceptance of the work.

D. Separation of Circuits. Unless otherwise permitted by the Engineer, lighting circuits shall be separate from power circuits.

E. Construction Wiring. All wiring for temporary electric light and power shall be properly installed and maintained and shall be securely fastened in place. All electrical shall conform to the facilities requirements of Subpart K of the OSHA Safety and Health Standards for Construction and St. Tammany Parish Codes.

3.02 WATER SUPPLY

A. General. The Contractor shall provide, at his own expense, 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 be solely responsible for the adequate functioning of its 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 connection made, the Contractor shall first attach to the fire hydrant or pipeline a valve and a meter, if required by the said authority, of a size and type acceptable to said authority and agency. Only approved hydrant 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 gage shall be utilized to prevent back flow into the water main system. In addition, all such testing should be performed in the presence of Tammany Utilities personnel.

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 Engineer 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 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 a manner satisfactory to the Engineer and in accordance with all laws and regulations pertaining thereto. Disposal of all such wastes shall be at the Contractor's expense.

3.04 SAFETY

A. General. Appropriate first aid facilities and supplies shall be kept and maintained by the Contractor at the site of the work. In addition, all employees of the Contractor and his subcontractors shall be provided with, and required to use, personal protective and life saving equipment as set forth in Subpart E of the OSHA Safety and Health Standards for Construction (29 CFR 1926).

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

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 01530

PROTECTION OF EXISTING FACILITIES AND PROPERTY

PART 1 - GENERAL

1.01 DESCRIPTION

The Contractor shall protect all existing utilities, structures, and improvements not designated for removal and shall restore damaged or temporarily relocated utilities and improvements to a condition equal to or better than they were prior to such damage or temporary relocation, all in accordance with requirements specified herein, and in accordance with the requirements of the Contract Documents.

1.02 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 his expense, to a condition similar or equal to that existing before the damage immediately was done, or he shall make good the damage in another manner acceptable to the Engineer.

B. Along the location of this Work all fences, walks, brushes, trees, shrubbery, and other physical features shall be protected and restored in a thoroughly workmanlike manner. Fences and other features removed by the Contractor shall be replaced in the location indicated by the Engineer as soon as conditions permit. All grass areas beyond the limits of construction which have been damaged by the Contractor shall be regraded and sodded.

C. Trees close to the Work shall be boxed or otherwise protected against injury. The Contractor shall trim all branches that are liable to damage because of his operations, but in no case shall any tree be cut or removed without prior notification of the Engineer. All injuries to bark, trunk, limbs, and roots of trees shall be repaired by dressing, cutting, and painting according to approved methods, using only approved tools and materials.

D. The protection, removal, and replacement of existing physical features along the line of work shall be a part of the work under the Contract, and all costs in connection therewith shall be included in the unit and/or lump sum prices established under the items in the Proposal.

1.03 OPEN EXCAVATIONS

All open excavations shall be adequately safeguarded by providing temporary barricades, cautions signs, lights, and other means to prevent accidents to persons, and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen.

1.04 UTILITY EXPLORATION

A. Test pits for the purpose of locating underground pipelines or structures in advance of the construction shall be excavated and backfilled by the Contractor prior to commencement of construction. 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.

B. The Contractor shall determine the exact locations and depths of all utilities indicated on the drawings. In addition to those indicated, the Contractor shall make exploratory excavations of all utilities. All such exploratory excavations shall be performed as soon as practicable after award of contract and, in any event, a sufficient time in advance of construction to avoid possible delays to the Contractor's work. When such exploratory excavations show the utility location as indicated on the drawings to be in error, the Contractor shall so notify the Engineer. The number of exploratory excavations required shall be that number which is sufficient to determine the alignment of the utility.

C. The locations of underground and other nonvisible utilities shown have been determined from data either furnished by the agencies controlling such data and/or extracted from records made available by agencies controlling such records. Where found, the surface features of locations are shown. The actual nonvisible locations may vary from those shown. Each agency should be contacted relative to the precise location of its underground installation prior to any reliance upon the accuracy of such location shown. Prior to excavating, the Contractor shall call Louisiana One Call (1-800-272-3020) to mark the construction area.

1.05 RIGHTS-OF-WAY

A. The Contractor shall not do any work that would affect any oil, gas, sewer, or water pipeline; any telephone, telegraph, or electric transmission line; any fence; or any other structure, nor shall the Contractor enter upon the rights-of-way involved until the Contractor has secured authority therefore from the proper party. After authority has been obtained, the Contractor shall give said party due notice of his intention, and shall give said party convenient access to every facility for removing, shoring, supporting, or otherwise protecting such pipeline, transmission line, ditch, fence, or structure, and for replacing same. When 2 or more contracts are being executed at one time on the same or adjacent land in such manner that work on one contract may interfere with that on another, the Owner shall decide which Contractor shall progress at the same time, and in what manner. When the territory of one contract is the necessary or convenient means of access for the execution of another contract, such

privilege of access or any other reasonable privilege may be granted by the Owner to the Contractor so desiring, to the extent, amount, in the manner, and at the times permitted. No such decision as to the method or time of conducting the work or the use of territory shall be made the basis of any claim for delay or damage, except as provided for temporary suspension of the work in Article 15, of the General Conditions of the Contract.

B. The Contractor shall be aware that his work will be performed adjacent to private property. The Contractor shall notify all property owners adjacent to and along the route once at the award of the contract and once at least 48 hours in advance of construction by means of either a printed circular or form letter of the general details of the construction. The letter shall also include names and telephone numbers for key project personnel so that property owners can report problems. These contact telephone numbers shall be given so that appropriate personnel can be contacted 24 hours a day, seven days a week.

C. The Contractor shall not enter or occupy private land outside of easements, except by permission of the Owner.

1.06 PROTECTION OF STREET OR ROADWAY MARKERS AND TRAFFIC SIGNS

The Contractor shall not destroy, remove, or otherwise disturb any existing survey markers or other existing street or roadway markers without proper authorization. It shall be the Contractor's responsibility to notify the proper representatives of the Owner of the time and location that work will be done. Such notification shall be sufficiently in advance of construction so that there will be no delay due to waiting for survey points to be satisfactorily referenced for restoration. All survey markers or points disturbed, without proper authorization by the Engineer, will be accurately restored at the Contractors expense. All traffic signs shall be restored to the original condition and location at the Contractors expense.

1.07 NOTIFICATION BY THE CONTRACTOR

Prior to any excavation in the vicinity of any existing underground facilities, including all water, sewer, storm drain, gas, petroleum products, or other pipeline; all buried electric power, communications, or television cables; all traffic signal and street lighting facilities; and all roadway and state highway rights-of-way the Contractor shall notify the respective authorities representing the owners or agencies responsible for such facilities five (5) working days prior to excavation so that a representative of said owners or agencies can be present during such work if they so desire. The Contractor shall request that each utility Owner mark (or stakeout) in the field the location of existing facilities.

1.08 CONFLICTS WITH OTHER UTILITIES

A. At various locations along the project, the proposed pipeline may closely parallel or cross existing gas lines, buried telephone cables or ducts or other utilities.

B. It shall be the Contractors responsibility to give the appropriate utility company sufficient advance notice so that their representatives may verify the utility location on the job site when trenching operations begin. The Contractor shall coordinate and cooperate with these utilities to insure that no damages occur which would cause interruption of their services.

C. All temporary support, or minor adjustment which does not require replacement or direct by-pass connections to these existing services (such as all direct-buried telephone cables or two-inch and smaller gas lines) will be the responsibility of the Contractor.

D. The Owner will not be responsible for any delay or inconvenience to the Contractor resulting from the existence, removal or adjustment of any utility. Additional costs incurred as a result therefore shall be the expense of the Contractor, and considered as included in the contract bid.

E. Maintenance of Drainage. Contractor shall be responsible for maintenance of existing drainage patterns by temporary ditches, culverts, etc. All existing drainage facilities shall be returned to original condition prior to completion of contract.

1.09 RELATED WORK

Section 02901 Tree Protection (if required)

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 EXISTING UTILITIES AND IMPROVEMENTS

A. General: The Contractor shall protect all utilities and other improvements which may be impaired during construction operations. It shall be the Contractors responsibility to ascertain the actual location of all existing utilities and other improvements indicated on the drawings that will be encountered in his construction operations and to see that such utilities or other improvements are adequately protected from damage due to such operations. The Contractor shall take all possible precautions for the protection of unforeseen utility lines to provide for uninterrupted service and to provide such special protection as may be directed by the Engineer.

B. Owner's Right of Access: The right is reserved to the Owner and to the owners of public utilities and franchises to enter at any time upon any public street, alley, right-of-way, or easement for the purpose of making changes in their property made necessary by the work of this Contract.

C. Known Utilities: Existing utility lines that are shown on the drawings or the locations of which are made known to the Contractor prior to excavation and that are to be retained, and all utility lines that are constructed during excavation operations shall be protected from damage during excavation and backfilling and, if damaged, shall be immediately repaired by the Contractor at his expense.

D. Unknown Utilities: The Contractor is required to use care in preparing excavations and shall conduct Utility Explorations including utility excavations and field investigations to assess the layout of subsurface facilities at each excavation site prior to the commencement of work. The Contractor shall uncover subsurface obstructions in advance of construction so that existing subsurface facilities may be identified before the work reaches the obstruction. The Contractor shall proceed at all times with caution while excavating.

E. Should the Contractor encounter subsurface and/or latent conditions at the site substantially different from those shown on the Drawings or indicated in the Specifications, he shall immediately give notification to the Engineer of such conditions. The Engineer shall thereon promptly investigate the conditions and if he finds that they are substantially different from those shown on the Plans or Specifications, he shall make such changes in the Plans and/or Specifications as he may find necessary. Any increase or decrease in the cost resulting from these changes when appropriate shall be adjusted under the applicable provisions of the contract documents.

F. Utilities to be Removed: When utility lines that are to be removed are encountered within the area of operations, the Contractor shall notify the Utility Owner and the Engineer a sufficient time in advance for the necessary measures to be taken to prevent interruption of the service.

G. Approval of Repairs: All repairs to a damaged improvement shall be inspected and approved by an authorized representative of the improvement owner before being concealed by backfill or other work.

H. Relocation of Utilities: Where the proper completion of the work requires the temporary or permanent removal and/or relocation of an existing utility or other improvement which is shown on the drawings, the Contractor shall at his own expense and with prior approval from the Owner of the utility, remove and, without, unnecessary delay, temporarily replace or relocate such utility or improvement in a manner satisfactory to the Owner of the facility. In all cases of such temporary removal or relocation, restoration to former location shall be accomplished by the Contractor in a manner that will restore or replace the utility or improvement as nearly as possible to its former locations and to as good or better condition than found prior to removal. In the event that the Utility Owner prefers its personnel to perform the above described work, the Contractor shall fully reimburse said utility Owner for any costs associated with such work.

I. Maintaining in Service: All oil and gasoline pipelines, power, and telephone or other communication cable ducts, gas and water mains, irrigation lines, sewer lines, storm drain lines, poles, and overhead power and communication wires and cables encountered along the line of the work shall be maintained continuously in service during all the operations under the Contract, unless other arrangements are made satisfactory to the Owner of said pipelines, duct, main, irrigation line, sewer, storm drain, pole or wire or cable. The Contractor shall be responsible for and shall make good all damage due to its operations, and the provisions of this Section shall not be abated even in- the event such damage occurs after backfilling or is not discovered until after completion of the backfilling.

3.02 SUBSURFACE OBSTRUCTIONS

A. The Contractor shall, field determine before pipeline trench and associated excavations are begun the depth and location of existing utilities. Utility locations indicated on the plans were obtained from the records available, but have not been field verified, nor have depths been measured or observed. The Contractor shall submit descriptions, depths and locations of subsurface obstructions to the Engineer for review at the time it is determined that obstructions exist before or after excavation.

B. In excavation, backfilling, and in laying pipe, care shall be taken not to remove, disturb, or injure existing pipes, conduits or structures. If necessary, the Contractor at his own expense, shall sling, shore up, and maintain such structures in operation.

C. The Contractor shall obtain the permission of and give sufficient notice to the proper authorities of their intention to remove or disturb any pipe, conduit, etc., and shall abide by their regulations governing such work.

D. In the event that subsurface structures are broken or damaged in the prosecution of the Work, the Contractor shall immediately notify the proper authorities and the Engineer, and at the option of said authority, either repair the damage at once at his own expense, or pay the proper charges for repairing said damage. Repairs shall be made to the satisfaction of the Owner. The Contractor shall be responsible for any damage to, persons or property caused by such breaks, or due to his own neglect in reporting and/or repairing such damages.

3.03 TREES AND SHRUBS WITHIN RIGHTS-OF-WAY AND PROJECT LIMITS

A. General: The Contractor shall exercise all necessary precautions so as not to damage or destroy any trees or shrubs, including those lying within street rights-of-way and within or outside the project limits, and shall not trim, remove or relocate any trees unless such trees have been approved for trimming, removal or relocation by the Engineer and the jurisdictional agency or Owner. All existing trees and shrubs which are damaged during construction shall be trimmed, replaced, or relocated by a

certified tree company under permit from the jurisdictional Agency or Owner. Tree trimming, replacement, and relocation shall be accomplished in accordance with the following paragraphs. The cost of such work shall be considered incidental to the construction of the facilities proposed and no direct payment will be made.

B. Preserve: Contractor shall take extra measures to protect trees designated to be preserved, such as erecting barricades, trimming to prevent damage from construction equipment, and installing pipe and other Work by means of hand excavation or tunneling methods. Such trees shall not be endangered by stockpiling excavated material or storing equipment against trunk.

C. Trimming: Symmetry of the tree and shrubs shall be preserved; no stubs or splices or torn branches left; clean cuts shall be made close to trunk or large branch. Spikes shall not be used for climbing live trees. All cuts over 1-1/2 inches in diameter shall be coated with an asphaltic emulsion material. See Section 02901 for tree protection if required.

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 01550

SITE ACCESS

PART 1 - GENERAL

1.01 HIGHWAY LIMITATIONS

The Contractor shall make its own investigation of the condition of available public and private roads and of clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress to the site of the Work. It shall be the Contractor's responsibility to, construct and maintain, at its own expense, any haul roads required for his construction operations.

1.02 TEMPORARY CROSSINGS

A. General: Wherever necessary or required for the convenience of the public or individual residents at street or highway crossings, private driveways, or elsewhere, the Contractor shall provide suitable temporary bridges over unfilled excavations, except in such cases as the Contractor shall secure the written consent of the individuals or authorities concerned to omit such temporary bridges, which written consent shall be delivered to the Engineer prior to excavation. All such bridges shall be maintained in service until access is provided across the backfilled excavation. Temporary bridges for street and highway crossing shall conform to the requirements of the authority having jurisdiction in each case, and the Contractor shall adopt designs furnished by said authority for such bridges, or shall submit designs to said authority for approval, as may be required.

B. Street Use: Nothing herein shall be construed to entitle the Contractor to the exclusive use of any public street, alleyway, or parking area during the performance of the Work hereunder, and he shall so conduct his operations as not to interfere unnecessarily with the authorized work of utility companies or other agencies in such streets, alleyways, or parking areas. No street shall be closed in the public without first obtaining permission of the Owner and proper governmental authority. Where excavation is being performed in primary streets or highways, one lane in each direction shall be kept open to traffic at all times unless otherwise provided or shown. Toe boards shall be provided to retain excavated material if required by the Engineer or the agency having jurisdiction over the street or highway. Fire hydrants on or adjacent to the Work shall be kept accessible to fire-fighting equipment at all times. Temporary provisions shall be made by the Contractor to assure the use of sidewalks and the proper functioning of all gutters, sewer inlets, or other drainage facilities.

C. Street Closure: If closure of any street is required during construction, a formal application for a street closure shall be made to the authority having jurisdiction at least 30 days prior to the required street closure in order to review necessary signing and detour requirements.

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 01560

TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 - GENERAL

1.01 EXPLOSIVES AND BLASTING

The use of explosives on the work will not be permitted.

1.02 DUST ABATEMENT

The Contractor shall furnish all labor, equipment, and means required and shall carry out effective measures wherever and as often as necessary to prevent its operation from producing dust in amounts damaging to property, cultivated vegetation, or domestic animals, or causing a nuisance to persons living in or occupying buildings in the vicinity. The Contractor shall be responsible for any damage resulting from any dust originating from its operations. The dust abatement measures shall be continued until the Contractor is relieved of further responsibility by the Engineer.

1.03 RUBBISH CONTROL

During the progress of the work, the Contractor shall keep the site of the work and other areas used by it in a neat and clean condition, and free from any accumulation of rubbish. The Contractor shall dispose of all rubbish and waste materials of any nature occurring at the work site, and shall establish regular intervals of collection and disposal of such materials and waste. The Contractor shall also keep its haul roads free from dirt, rubbish, and unnecessary obstructions resulting from its operations. Equipment and material storage shall be confined to areas approved by the Engineer. Disposal of all rubbish and surplus materials shall be off the site of construction, at the Contractor's expense, all in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and to the particular requirements of Subpart H, Section 1926.252 of the OSHA Safety and Health Standards for Construction.

1.04 CHEMICALS

All chemicals used during project construction or furnished for project operation, whether defoliant, soil sterilant, herbicide, pesticide, disinfectant, polymer, reactant or of other classification, shall show approval of either the U.S. Environmental Protection Agency or the U.S. Department of Agriculture. Use of all such chemicals and disposal of residues shall be in strict accordance with the printed instructions of the manufacturer.

1.05 TEMPORARY DRAINAGE PROVISIONS

A. Contractor shall provide for the drainage of stormwater and such water as may be applied or discharged on the site in performance of the work. Drainage facilities shall be adequate to prevent damage to the work, the site, and adjacent property.

B. Existing drainage channels and conduits shall be cleaned, enlarged or supplemented as necessary to carry all increased runoff attributable to Contractor's operations. Dikes shall be constructed as necessary to divert increased runoff from entering adjacent property (except in natural channels), to protect owner's facilities and the work, and to direct water to prevent downstream flooding. The Contractor must obtain permission from the Owner before beginning any of the above mentioned work.

1.06 EROSION CONTROL

A. Contractor shall prevent erosion of soil on the site and adjacent property resulting from his construction activities. Effective measures shall be initiated prior to the commencement of clearing, grading, excavation, or other operation that will disturb the natural protection.

B. Work shall be scheduled to expose areas subject to erosion for the shortest possible time, and natural vegetation preserved to the greatest extent practicable. Temporary storage and construction buildings shall be located, and construction traffic routed, to minimize erosion. Temporary fast growing vegetation or other suitable ground cover shall be provided as necessary to control runoff.

1.07 POLLUTION CONTROL

Contractor shall prevent the pollution of drains and watercourses by sanitary wastes, sediment, debris and other substances resulting from construction activities. No sanitary wastes will be permitted to enter any drain or watercourse other than sanitary sewers. No sediment, debris or other substance will be permitted to enter sanitary sewers and reasonable measures will be taken to prevent such materials from entering any drain or watercourse.

1.08 NOISE ABATEMENT

It shall be the responsibility of the Contractor to be in compliance with St. Tammany Parish Municipal Code for noise. Contractor shall provide for noise abatement for all equipment and procedures that might be required for execution of the project. Noise levels are not to exceed 75 (dB(A)).

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01570

TRAFFIC REGULATION

PART 1 – GENERAL

1.01 DESCRIPTION

The CONTRACTOR shall be responsible for the development and implementation of a traffic control device plan (TCDP) which will provide for the safe and expeditious movement of traffic through construction zones and provide access to all residences and businesses at times in particular for mail deliveries, garbage pick-up, emergency vehicles and all other required services. A construction zone is defined as the immediate area of actual construction, which interferes with the driving or walking public. The TCDP shall comply with the requirements set forth in the Manual on Uniform Traffic Control Devices (MUTCD), as revised, and with the general requirements stipulated below.

1.02 CERTIFICATION

The TCDP shall be designed and stamped by a Professional Engineer registered in the State of Louisiana that is qualified by education and experience to perform this type of work.

1.03 SUBMITTALS

A. The TCDP for the site shall address the conditions for providing traffic flow within the zone during the influence of construction. The TCDP shall be schematically drawn on 8 ½" x 11" sheet(s) with adequate details and be easily readable and reproducible.

B. Where the TCDP involves a state highway, the CONTRACTOR shall submit seven (7) copies of the TCDP to the Louisiana Department of Transportation's Engineering Division's. Such approval is required prior to start of any work.

C. The TCDP shall be submitted to the Project Engineer for review and approval at least 30 days before the commencement of any work. The Contractor shall anticipate a minimum two (2) week review and approval period for a TCDP by the Engineer and all applicable St. Tammany Parish Government departments.

D. All road closure and detour requests must be submitted for approval by Tammany Utilities, Department of Engineering, and the Department of Public Information no less than three (3) weeks before the closure is required. The Road Closure request shall be accompanied by a copy of the previously approved Traffic Control Device Plan (TCDP) with the area requested for closure highlighted as well as a "Major Street Closure Check List" and a "Road Closure Notice". This request, upon approval of the Engineer, shall be routed through Tammany Utilities. The Contractor shall

anticipate a three (3) week Road Closure Request review, approval and dissemination period. St. Tammany Parish Government nor the Engineer shall not be held responsible for any delays or damages resulting from a deviation of the Traffic Control and Road Closure policy herein.

PART 2 – PRODUCTS

2.01 TRAFFIC CONTROL DEVICES

Warning signs, signals, lighting devices, markings, barricades and hand signaling devices used in the TCDP shall comply with the standard sizes and dimensions specified in the Manual of Uniform Traffic Control Devices.

PART 3 – EXECUTION

3.01 TRAFFIC CONTROL

A. The necessary precautions shall include, but not be limited to, such items as proper construction warning signs, signals, lighting devices, markings, barricades, channelization, and hand signaling devices (flagging operations) as prescribed and set forth in the Manual of Uniform Traffic Control Devices. The CONTRACTOR shall be responsible for installation and maintenance of all devices for the duration of the construction period.

B. All work shall be performed in accordance with LADOTD standard specifications, latest edition, except as noted. In addition to items shown on the plans, traffic control devices shall be in accordance with MUTCD.

C. The CONTRACTOR shall be responsible for removal, relocation, or replacement of any traffic control devices in the construction area, which exist as part of the normal pre-construction traffic control scheme of the OWNER. Any such actions shall be performed by the CONTRACTOR under the supervision of the OWNER.

D. The CONTRACTOR shall consult with the ENGINEER and OWNER immediately on any vehicular or pedestrian safety or efficiency problem incurred as a result of construction of the project. If warranted, the CONTRACTOR'S engineer shall make adjustments to the TCDP and the CONTRACTOR shall immediately implement the revised TCDP.

E. The CONTRACTOR is responsible for daily monitoring of traffic control devices and must make appropriate changes to correspond to actual conditions.

F. The CONTRACTOR is responsible for daily monitoring of traffic control devices and must make appropriate changes to correspond to actual conditions.

G. The CONTRACTOR shall make a daily inspection of all MUTC devices for adherence to the submitted plan. The CONTRACTOR shall have a local representative on call in order to remediate or correct any MUTC device deficiencies during non–work hours. The CONTRACTOR shall employ the best available industry practices to eliminate the movement or property damage resulting from the movement of MUTC devices during weather events.

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Material and equipment incorporated into the work:

1. Conform to applicable specifications and standards.
2. Comply with size, make, type and quality specified, or as specifically approved, in writing, by the Engineer.
3. Manufactured and Fabricated Products:

   a. Design, fabricate and assemble in accord with the best engineering and shop practices.
   b. Manufacture like parts of duplicate units to standard sizes and gages, to be interchangeable.
   c. Two or more items of the same kind shall be identical, by the same manufacturer.
   d. Products shall be suitable for service conditions.

4. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

1.02 RELATED REQUIREMENTS

A. Conditions of the Contract

B. Section 01010: Summary of Work

C. Section 01340: Shop Drawings, Product Data and Samples

D. Section 01710: Cleaning

E. Section 01730: Operating and Maintenance Data

1.03 REUSE OF EXISTING MATERIAL

Except as specifically indicated or specified, materials and equipment removed from the existing structure shall not be used in the completed work.

1.04 MANUFACTURER'S INSTRUCTIONS

A. When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, including two copies to the Engineer.

1. Maintain one set of complete instructions at the job site during installation and until completion.

B. Handle, install, connect, clean, condition and adjust products in strict accord with such instructions and in conformity with specified requirements.

1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Engineer for further instructions.
2. Do not proceed with work without clear instructions.

C. Perform work in accord with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.05 TRANSPORTATION AND HANDLING

A. Arrange deliveries of products in accord with construction schedules; coordinate to avoid conflict with work and conditions at the site.

1. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
2. Immediately upon delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals, and that products are properly protected and undamaged.

B. Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

1.06 STORAGE AND PROTECTION

A. Store products in accord with manufacturer's instructions, with seals and labels intact and legible.

1. Store products subject to damage by the elements in weather tight enclosure.
2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.

B. Exterior Storage

1. Store fabricated products above the ground, on blocking or skids, prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings, provide adequate ventilation to avoid condensation.

2. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter and entrance to drainage systems.

C. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration.

D. Protection after Installation

Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.

1.07 SUBSTITUTIONS AND PRODUCT OPTIONS

A. Products List

Within 30 days after contract date, submit to the Engineer a complete list of major products proposed to be used, with the name of the manufacturer, supplier, and the installing subcontractor.

B. Contractor's Options

1. For products specified only by reference standard, select any product meeting that standard.
2. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named, which complies with the specifications.
3. For products specified by naming one or more products or manufacturers and "or equal", Contractor must submit a request as for substitutions for any product or manufacturer not specifically named.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 01620

STORAGE AND PROTECTION

PART 1 – GENERAL

1.01 SCOPE OF WORK

Provide secure storage and protection for products to be incorporated before and after installation and until completion of the Work.

1.02 STORAGE

A. Store products immediately on delivery, and protect until installed in the Work.

1. Store in accordance with manufacturer's instruction, with seals and labels intact and legible.

B. Store Products subject to damage by elements in substantial weather tight enclosures.

1. Maintain temperatures within ranges required by manufacturer's instructions.

2. Provide humidity control for sensitive products, as required by manufacturer's instruction.

3. Store unpacked products on shelves, in bins or in neat piles, accessible for inspection.

C. Exterior Storage

1. Provide substantial platforms, blocking or skids to support fabricated products above ground, prevent soiling or staining.

a. Cover products, subject to discoloration or deterioration from exposure to the elements, with impervious sheet coverings. Provide adequate ventilation to avoid condensation.

2. Store loose granular materials on solid surfaces such as paved areas, or provide plywood or sheet materials to prevent mixing with foreign matter.

a. Provide surface drainage to prevent flow or ponding of rainwater.

b. Prevent mixing of refuse or chemically injurious materials or liquids.

D. Arrange storage in a manner to provide easy access for inspection.

END SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

Comply with requirements stated in Conditions of the Contract and in specifications for administrative procedures in closing out the work.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Conditions of the Contract. Fiscal provisions, legal submittals and additional administrative requirements.

B. Section 01710: Cleaning.

C. Section 01720: Project Record Documents.

D. Section 01730: Operating and Maintenance Data.

E. Section 01740: Warranties and Bonds.

1.03 SUBSTANTIAL COMPLETION

A. When the Contractor considers the work is substantially complete, he shall submit to the Engineer:

1. A written notice that the work, or designated portion thereof, is substantially complete.
2. A list of items to be completed or corrected.

B. Within a reasonable time after receipt of such notice, the Engineer will make an inspection to determine the status of completion.

C. Should the Engineer determine that the work is not substantially complete:

1. The Engineer will promptly notify the Contractor, in writing, giving the reasons therefore.
2. The Contractor shall remedy the deficiencies in the work, and send a second written notice of substantial completion to the Engineer.
3. The Engineer will re-inspect the work.

D. When the Engineer finds that the work is substantially complete, he will:

1. Prepare and deliver to the Owner a tentative Certificate of Substantial Completion on the appropriate parish form with - a tentative list of items to be completed or corrected before final payment.

2. After consideration of any objections made by the Owner as provided in Conditions of the Contract, and when the Engineer considers the work substantially complete, he will execute and deliver to the Owner and the contractor a definite Certificate of Substantial Completion with a revised tentative list of items to be completed or corrected.

1.04 FINAL INSPECTION

A. When Contractor considers the work is complete, he shall submit written certification that:

1. Contract Documents have been reviewed.
2. Work has been inspected for compliance with Contract Documents.
3. Work has been completed in accordance with Contract Documents.
4. Equipment and systems have been tested in the presence of the Owner's representative and are operational.
5. Work is completed and ready for final inspection.

B. Engineer will make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.

C. Should Engineer consider that the work is incomplete or defective:

1. Engineer will promptly notify the contractor, in writing, listing the incomplete or defective work.
2. Contractor shall take immediate steps to remedy the stated deficiencies and send a second written certification to Engineer that the work is complete.
3. Engineer will re-inspect the work.

D. When the Engineer finds that the work is acceptable under the Contract Documents, he shall request the Contractor to make closeout submittals.

1.05 REINSPECTION FEES

A. Should the Engineer perform re-inspections due to failure of the work to comply with the claims of status of completion made by the Contractor:

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.

1.06 FINAL ADJUSTMENT OF ACCOUNTS

A. Submit a final statement of accounting to the Engineer.

B. Statement shall reflect all adjustments to the Contract Sum:

1. The original Contract Sum.
2. Additions and deductions resulting from:

(a) Previous Change Orders
(b) Unit Prices
(c) Penalties and Bonuses
(d) Deductions for liquidated damages
(e) Deductions for re-inspection payments
(f) Other adjustments

3. Total Contract Sum, as adjusted.
4. Previous payments.
5. Sum remaining due.

C Engineer will prepare a final Change order, reflecting approved adjustments to the contract sum which are not previously made by change orders.

1.07 FINAL APPLICATION FOR PAYMENT

Contractor shall submit the final application for payment in accordance with procedures and requirements stated in the Conditions of the Contract.

1.08 CONTRACTOR'S CLOSEOUT SUBMITTALS TO ENGINEER

A. Project Record Documents.

B. Warranties and Bonds.

C. Evidence of Payment and Release of Liens: To requirements of General and Supplementary conditions.

D. Certificates of Insurance for Products and Completed operations.

E. As-Built Drawings.

F. Maintenance Manuals.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01710

CLEANING

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

Execute cleaning, during progress of the work, and at completion of the work, as required by General conditions.

1.02 RELATED REQUIREMENTS

A. Conditions of the Contract.

B. Each Specification Section: Cleaning for specific products or work.

1.03 DISPOSAL REQUIREMENTS

Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.

B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.

C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.01 DURING CONSTRUCTION

A. Execute periodic cleaning to keep the work, the site and adjacent properties free from accumulations of waste materials, rubbish and windblown debris, resulting from construction operations.

B. Provide on-site containers for the collection of waste materials, debris and rubbish.

C. Remove waste materials, debris and rubbish from the site periodically and dispose of at legal disposal areas away from the site.

3.02 FINAL CLEANING

A. Employ skilled, workmen for final cleaning.

B. Rake the surfaces of the grounds clean.

C. Prior to final completion, or Owner occupancy, Contractor shall conduct an inspection of sight-exposed exterior surfaces, and all work areas, to verify that the entire work is clean.

END OF SECTION

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

The Contractor shall maintain at the site for the Owner's permanent records one copy of:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other Modifications to the Contract.
5. Engineer Field Orders or Written Instructions.
6. Approved Shop Drawings, Product Data.
7. Field Test Records.
8. Construction Photographs.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01340: Shop Drawings, Product Data and Samples.

B. Section 01700: Contract Closeout.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. The Contractor shall store documents and samples in his office apart from documents used for construction.

B. The Contractor shall maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

C. The Contractor shall make documents and samples available at all times for inspection by the Engineer and Owner.

3.02 MARKING-UP RECORD DRAWINGS

The Contractor shall mark with red erasable pencil and, where necessary, use other pencil colors, as required.

3.03 RECORDING

A. Label each document (including record prints and shop drawings) "PROJECT RECORD" in neat large printed letters.

B. Record information concurrently with construction progress. Do not conceal any work until required information is recorded.

C. Drawings. Legibly mark field drawings to record actual construction:

1. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
2. Field changes of dimensions and details.
3. Changes made by change order.
4. Details not on original Contract Drawings.

D. Specifications and Addenda. The Contractor shall legibly mark each Section to record:

1. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.
2. Changes made by Field Order or by Change Order.

3.04 SUBMITTALS

A. At Contract close-out deliver record documents to the Engineer including marked-up drawings, as-built survey, specifications, addenda, change orders and other modifications to contract; Engineers field orders and written instructions, approved shop drawings, product data, field test records and any other documents which serve as a record of actual field installation and construction different from the original contract documents. Engineer will submit them to Owner.

B. Accompany submittals with transmittal letters in duplicates containing:

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

END OF SECTION

SECTION 01730

OPERATING AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Compile product data and related information appropriate for Owner's maintenance and operation of products furnished under contract. Prepare operating and maintenance data as specified in this section and as referenced in other pertinent sections of the specifications.

B. Instruct Owner's personnel in maintenance of products and in operation of equipment and systems.

1.02 RELATED REQUIREMENTS

A. Section 01340: Shop Drawings, Product Data and Samples.

B. Section 01700: Contract Closeout.

C. Section 01740: Warranties and Bonds.

1.03 FORM OF SUBMITTALS

A. Prepare data in form of an instructional manual for use by Owner's personnel.

B. Format:

1. Size: 8 1/2" X 11".
2. Paper: 20 pound minimum, white, for typed pages.
3. Text: Manufacturer's printed data, or neatly typewritten.
4. Drawings:

    a. Provide reinforced punched binder tab, bind in with text.
    b. Fold larger drawings to size of text pages.

5. Provide fly-leaf for each separate product or each piece of operating equipment.

    a. Provide typed description of product and major component parts of equipment.
    b. Provide indexed tabs

6. Cover: Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS".

7. List:

    a. Title of project.
    b. Identity of separate structure as applicable.
    c. Identity of general subject matter covered in the manual.

C. Binders:

1. Commercial quality 3-ring binders with durable and cleanable plastic covers.
2. Maximum ring size: 1"
3. When multiple binders are used, correlate the data into related consistent groupings.

1.04 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Submit five (5) copies of complete manual in final form.

B. Content, for each unit of equipment and system, as appropriate:

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.

    a. 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. Each contractor's coordination drawings.

    a. 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. 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. Submit two (2) copies of preliminary draft of proposed formats and outlines of contents. Engineer will review draft and return one copy with comments.

B. 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. Submit specified number of copies of approved data in final form ten (10) days after final inspection.

1.06 INSTRUCTION OF OWNER'S PERSONNEL

A. Prior to final inspection or acceptance, fully instruct Owner's designated operating and maintenance personnel in operation, adjustment and maintenance of products, equipment and systems.

B. Operating and maintenance manual shall constitute the basis of instruction. Review contents of manual with 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. Compile specified warranties and bonds.

B. Compile specified service and maintenance contracts.

C. Co-execute submittals when so specified.

D. Review submittals to verify compliance with Contract Documents.

E. Submit to Engineer for review and transmittal to owner.

1.02 RELATED REQUIREMENTS

A. Instructions to Bidders: Bid or Proposal Bonds.

B. Conditions of the Contract: Performance Bond and Labor and Material Payment Bond.

C. Conditions of the Contract: General Warranty of Construction.

D. Section 01700: Contract Closeout.

E. Section 01730: Operating and Maintenance Data.

1.03 SUBMITTAL REQUIREMENTS

A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.

B. Number of original signed copies required: Two (2) each.

C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.

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. Provide 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, name of responsible principal, address and telephone number.

1.04 FORM OF SUBMITTALS

A. Prepare in duplicate packets.

B. Format:

1. Size 8 ½" x 11", punch sheets for standard 3-ring binder. Fold larger sheets to fit into binders.
2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:

    a. Title of project.
    b. Name of Contractor.

C. Binders: Commercial quality, 3-ring, with durable and cleanable plastic covers.

1.05 TIME OF SUBMITTALS

A. 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, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

1.06 SUBMITTALS REQUIRED

Submit warranties, bonds, service and maintenance contracts as specified in respective sections of specifications.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

Section 02000

TEMPORARY SEWER BYPASS PUMPING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes
   1. Temporary bypass pumping for daily system shutdowns of sewer systems.
   2. Temporary bypass pumping for overnight or extended shutdowns of sewer systems.

B. Related Requirements
   1. CFPUA Material Specification Manual (MSM).

1.2 REFERENCES

A. Abbreviations and Acronyms
   1. ORC Operator in Responsible Charge (CFPUA)
   2. SSO Sanitary Sewer Overflow

B. Definitions
   1. Daily System Shutdowns: System gravity flows shall be restored daily before the end of regular work hours.
   2. Firm Capacity: The pumping capacity of a temporary bypass pumping system with the largest pump out of service.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination
   1. Coordinate temporary bypass pumping system testing with Engineer and ORC. Provide a minimum of three business days' notice prior to system testing. Engineer or ORC representative must observe testing for it to be accepted.
   2. Coordinate system shutdowns with Engineer and ORC.

B. Sequencing
   1. Operate temporary bypass pumping systems in accordance with the sequencing and phasing indicated on the Drawings.

C. Scheduling
   1. The Project Schedule shall include the sequencing and coordination of maintaining wastewater flow during all phases of construction including but not limited to:
      a. Sewer pump station upgrades and replacements
      b. Drainage, cleaning, and replacement of sewer mains, manholes, and force mains
      c. Trenchless rehabilitation of sewer and force mains
      d. Inspection and testing of new or rehabilitated sewers
      e. Connections to existing sewer mains and force mains

1.4 SUBMITTALS

A. Provide in accordance with Section 01 33 00 – Submittals.
   1. Temporary Bypass Pumping Plans designated by type and location.
      a. The Engineering Committee of the NC Board of Examiners for Engineers and Surveyors (NCBELS) ruled that providing design plans and calculations for temporary bypass pump systems is the practice of engineering and requires licensure with NCBELS per G.S. 89C-23 and -24, meaning the design work shall be done by Professional Engineers and companies licensed to practice engineering in North Carolina.
   2. System test results and operation logs.
   3. Obtain Engineer and ORC approval of submittals prior to mobilization of equipment included in the plans.

B. Temporary Bypass Pumping Plan – For Daily System Shutdowns
   1. Outline provisions and precautions to be taken to convey and maintain existing wastewater flows during construction.
   2. Ensure proper protection of existing facilities, the project area, and surrounding properties from damage due to the discharge of flows.
   3. Provide adequate standby equipment available and ready for immediate operation and use in the event of an emergency or breakdown. One standby pump for each size pump utilized shall be located at the mainline flow bypassing locations, ready for use in the event of primary pump failure. In this event, promptly repair or replace the failed equipment.
   4. Include the following as a minimum:
      a. Manufacturer's product data for bypass pumps including sizes, capacities, power requirements, and number of each size to be on site including primary, secondary, and spare pumps.
      b. Manufacturer's product data for bypass piping including make, material, material properties, diameter, thickness, pressure rating, and number to be on site.
      c. Calculations to demonstrate sufficient pump capacity for potential flows.
      d. Method of noise control for pumps, motors, and generators.
      e. Location and method of connection to the existing sewer on each side of the bypass if not provided in the Contract Documents.
      f. Number, size, material, and method of installation of suction and discharge piping, valves (isolation and air release), fittings, and other components for connection to the existing sewer system.
      g. Sewer isolation or plugging method and types of plugs or valves and fittings.
      h. Emergency plan for adverse weather and flooding for various phases of the Work.
      i. Incidental items required to ensure proper protection of the facilities.
      j. Traffic Control Plan where roads are impacted.
      k. Plan to divert pedestrian access where sidewalks are impacted.

C. Temporary Bypass Pumping Plan – For System Shutdowns Overnight or for Extended Periods
   1. Prepare and submit a project- and site-specific detailed temporary bypass pumping plan that provides detailed descriptions and layout drawings of the proposed temporary bypass pumping system(s). Outline provisions and

precautions to be taken by the Contractor to convey and maintain existing wastewater flows during construction.

2. Ensure proper protection of existing facilities, the project area, and surrounding properties from damage due to the discharge of flows.
3. Include the following as a minimum:
   a. Size of pipeline or conveyance system to be bypassed.
   b. Staging areas for pumps.
   c. Manufacturer's product data for temporary bypass pump sizes, capacities, power requirements, and number of each size to be on site including primary, secondary, and spare pumps. Provide method of operation and control, and redundancy sufficient to prevent SSOs.
   d. Provisions for standby power including generator size and location.
   e. Provisions for stand-by lighting.
   f. Method of noise control for pumps, motors, or generators.
   g. Location and method of connection to the existing sewer on each side of the bypass if not provided in the Contract Documents.
   h. Size and location of manholes or access points for suction and discharge hose or piping.
   i. Plan indicating location of temporary bypass pumping pipe locations.
   j. Number, size, material, location, and method of installation of suction and discharge piping, valves (isolation and air release), fittings, and connections to the existing sewer system.
   k. For buried piping, typical sections showing suction and discharge pipe depth, embedment, select fill and special backfill.
   l. Thrust and restraint block sizes and locations. Provide details necessary to demonstrate the integrity of restraint of suction and discharge piping including piping and fittings associated with primary and secondary pumping units.
   m. Sewer isolation or plugging method and types of plugs or valves and fittings.
   n. Discharge plan including method of protecting discharge manholes or structures from erosion and other damage.
   o. Access plans to temporary bypass pumping locations indicated on the drawings.
   p. Heavy equipment required for installation of pumps, piping, valves, fittings, and other materials.
   q. Temporary pipe supports and anchoring.
   r. Calculations of static lift, friction losses, and flow velocity (pump curves showing pump operating range shall be submitted).
   s. Calculations for selection of temporary bypass pumping pipe size.
   t. Schedule for installation, operation, maintenance, and removal of the temporary bypass pumping system(s).
   u. Emergency plan for adverse weather and flooding for various phases of the Work.
   v. Contractor's plan for providing continuous (24-hour) monitoring of the temporary bypass pumping operation as well as the monitoring persons' qualifications. Additionally, an auto-dialer alarm system shall be provided for loss of primary pump or high level at suction location.
   w. Plan for refueling pump sets on demand.
   x. Demonstration of compliance with the requirements and permit conditions specified in the Contract Documents.
   y. Incidental items necessary to insure proper protection of the facilities.

1.5 QUALITY ASSURANCE

A. Demonstrate, or employ the services of a subcontractor, who can demonstrate that they specialize in the design and operation of temporary sewer bypass pumping systems.

B. Comply with North Carolina OSHA Standards, Underwriter Laboratories, and other authorities having jurisdiction. The temporary bypass pumping system shall meet the requirements of codes and regulatory agencies having jurisdiction.

C. Materials and appurtenances shall be clearly, legibly, and appropriately marked for identification purposes. Marking shall include listing/approval stamp, label, or other marking indicating conformance with specified standards.

D. Perform temporary bypass pumping system testing in accordance with Part 3.

PART 2 PRODUCTS

2.1 TEMPORARY SEWER BYPASS PUMPING SYSTEMS FOR SYSTEM SHUTDOWNS EXTENDING OVERNIGHT

A. Pumps shall be fully automatic self-priming units that do not require the use of foot-valves or vacuum pumps in the priming system. Pumps may be electric, or diesel powered. Diesel powered pumps shall include critical grade silencing when used in residential settings or areas where excessive noise levels would create a disturbance. Critical grade silencing is not required on redundant bypass pumping.

Silencing Grade	Expected Attenuation (dBA)
Industrial	15 to 20
Residential	20 to 25
Critical	25 to 32
Super Critical	30 to 38
Hospital	35 to 42
Hospital Plus	35 to 50
Extreme	40 to 55
Super Extreme	45 to 60

B. Provide level detection equipment, alarms, drives, controls, fittings, valves, air release valves, fuel tanks, auxiliary fuel tanks, and other components for a reliable stand-alone system. Provide sufficient components for a redundant system.

C. Include 100 percent on-line pumping redundancy. Include a redundant bypass pump, intake and discharge conduit, and other equipment necessary to provide continuous wastewater flow and prevent the backing up of sewage in the event of primary system failure.

2.2 PERFORMANCE REQUIREMENTS

A. Design, install, operate, and maintain a temporary bypass pumping system to maintain continuous wastewater service to customers of CFPUA. The Contractor shall be responsible for bypass pumping of wastewater as required to prevent backing up of sewage (except as approved by CFPUA) and provide appropriate conditions for proper drainage, inspection, replacement, rehabilitation, testing or reconnections to existing sewers.

B. Temporary Bypass Pumping System Capacities

Location	Firm Capacity (GPM)

C. Operation
   1. Operators
      a. Provide on-site manual oversight by a responsible operator of temporary bypass pumping operations 24 hours per day, 7 days per week when the temporary bypass pumping systems are in operation.
      b. The 24-hour monitoring operator shall be properly trained, experienced, and mechanically qualified so that they can quickly and effectively address potential emergency and non-emergency situations associated with the pumps and temporary bypass pumping system.
   2. Controls
      a. Pumps shall operate on redundant control systems and be equipped with an auto-dialer, cellular, or SCADA monitoring and control. Controls shall be set so that the systems do not surcharge and create an SSO in upstream manholes or a backup of wastewater into residential or commercial facilities.
   3. Operation Sequences
      a. Comply with operating sequences provided by Engineer and ORC.

PART 3 EXECUTION

3.1 EXAMINATION

A. Inspect Work area and verify that existing conditions match the conditions depicted on the Drawings. Notify Engineer immediately of any discrepancies.

B. System Testing
   1. Perform leakage and pressure tests of the temporary bypass pumping discharge piping using clean water prior to operation. Pressure and leakage tests shall be conducted at 1.5 times the maximum working pressure, based on the approved Temporary Bypass Pumping Plan, for a period of two hours. No leakage is permitted during this test. Provide a leakage and pressure test report that documents start time and pressure, pressure at 15-minute intervals, stop time, end

of test pressure, and amount of leakage. Report shall be signed by the Contractor's on-site superintendent and project manager, and the Engineer or CFPUA representative.

2. Demonstrate that the temporary bypass pumping system is in good working order and is sufficiently sized to successfully convey wastewater flows by operating the system in automatic mode for a period of 24 hours prior to beginning Work.
3. Demonstrate alarms function as designed.
4. Demonstrate back-up pumps and systems operate as designed.

3.2 PREPARATION

A. Temporary bypass pumping operations shall not proceed until submittals have been approved.

B. Do not interrupt sewer service without prior approval of CFPUA.

C. Precautions
   1. Locate existing utilities in proximity to the temporary bypass pumping system. Install temporary bypass pumping system components to minimize disturbance to existing utilities and in accordance with the Temporary Bypass Pumping System Plan. Costs associated with relocating existing utilities and obtaining approvals shall be borne by the Contractor.
   2. During temporary bypass pumping system operation, protect the existing sanitary sewer facilities from damage inflicted by any equipment. The Contractor shall be responsible for physical damage to the existing sanitary sewer facilities caused by human or mechanical failure.

D. Protect existing facilities in accordance with Section 01 50 00 – Temporary Facilities and Controls.

3.3 INSTALLATION

A. General
   1. Prevent damage to existing structures. Discharge piping to gravity sewer systems shall be designed in such a manner as to prevent discharge from contacting manhole walls or benching. Full discharge shall go into the downstream pipe in a manner to minimize turbulence. It may be necessary to remove manhole cones to provide sufficient space for the bypass piping. Contractor is responsible for any damage to manholes. Repair damaged manholes to preconstruction condition.
   2. Make connections to the existing sewer and construct temporary bypass pumping structures only at the access locations indicated on the Drawings.
   3. The new sewer may be used by the Contractor to convey the sanitary flows after the new sewer has passed inspection and testing. CFPUA shall approve any temporary connections to the new sewer.
   4. Plugging or blocking of sewage flows shall incorporate a primary and secondary plugging device. When plugging or blocking is no longer needed for performance and acceptance of work, it is to be removed in a manner that permits the sewage flow to slowly return to normal without surge and that prevents surcharging or causing other major disturbances downstream.

5. When working inside a manhole or force main in the presence of sewer gases, combustible or oxygen-deficient atmospheres, and confined spaces, the Contractor shall exercise caution and comply with OSHA requirements.
6. Installation of bypass pipelines is prohibited in wetland areas unless specifically indicated or allowed in the Contract Documents. The pipeline must be located off streets (except where streets are shut down and detours or lane shifts are provided) and sidewalks and on shoulders of the roads or within easements. When the bypass pipeline crosses local streets and private driveways, install temporary road ramps.

B. Steel Pipe shall be installed in accordance with manufacturer recommendations. Locking pins shall be placed in couplings.

C. HDPE pipe shall be installed in accordance with AWWA M55 "PE Pipe – Design and Installation" and the "Handbook of Polyethylene Pipe" by the Plastics Pipe Institute. The pipe shall be joined by the butt fusion procedure outlined in ASTM F 2620 or PPI TR-33. Fusion joints shall be made in compliance with the pipe or fitting manufacturer's recommendations. Fusion joints shall be made by qualified fusion technicians per PPI TN-42.

3.4 OPERATION

A. Maintain flows in the existing upstream pumps stations, sewer interceptors, and tributary collector and lateral lines at all times and under all weather conditions except for brief periods when mains and services are disconnected and reconnected. Take actions and precautions necessary to prevent discharge of wastewater during disconnection and reconnection of mains including performing those tasks during off peak hours or providing additional temporary bypass measures. Interruption of flows that result in the discharge of wastewater will not be permitted.

B. Maintain sewer flow at the work area in a manner that will not cause surcharging of sewers or damage to sewers, and that will protect public and private property from damage and flooding.

C. Anticipate severe weather conditions and increases in peak flows during rain events and design and plan for these accordingly.

D. Immediately notify CFPUA should a sanitary sewer overflow (SSO) occur. Take necessary action to clean up and disinfect the spillage to the satisfaction of CFPUA and other governmental agencies with jurisdiction. If sewage is spilled onto public or private property, wash down, clean up, and disinfect the spillage to the satisfaction of the property owner, utility owner, and governmental regulatory agencies.

E. Overflows from temporary bypass operations shall not be permitted to enter streams or bodies of water. The Contractor shall be solely responsible for paying fines imposed and legal actions taken by state and federal regulatory agencies if overflows occur as a result of the temporary bypass pumping operations. Reimburse CFPUA for any damages, operational costs, fines, and other effects. Immediately remove and dispose of wastewater and waste material spilled during the temporary bypass pumping at his own expense.

F. Make every effort to avoid causing unplanned service outages. CFPUA will investigate service outages resulting from Contractor's operations. If the investigation determines that the Contractor could have avoided the service outage, then the outage shall result in disciplinary actions including but not limited to reimbursement to the CFPUA for any damages, operational costs, fines, and other effects.

G. Provide pipeline plugs, temporary suction piping, pumps of adequate size to handle peak flow, and temporary discharge piping to ensure that the total flow of the sewer main can be safely diverted around the section of sewer designated for rehabilitation. Do not stop or impede the main flows without prior approval by CFPUA.

H. Temporary bypass pumping systems for system shutdowns extending overnight shall be operated 24 hours per day.

I. Where portions of the Work require that tributary pump stations be taken out of service for prolonged periods, the Contractor shall construct a temporary bypass pumping system for those pump stations that discharge into either the existing piping downstream of the affected area, or to a neighboring gravity sewer (as identified by CFPUA) that flows to an unaffected pump station.

J. Temporary road ramps shall be used where necessary to maintain traffic flow in accordance with the Traffic Control Plan as required by Section 01 35 00, Special Procedures.

K. Cease bypass pumping operations and return flows to the new or existing sewer when directed by CFPUA.

L. Contractor shall repair, at his own expense, any damage to public or private property caused by his operations.

M. A copy of the CFPUA approved Temporary Bypass Pumping Plan shall be available onsite at all times during temporary bypass pumping operations.

3.5 MONITORING

A. Operators shall perform inspections of the temporary bypass pumping system and operation at a minimum of hourly intervals. Inspections shall include at a minimum:
   1. Observation of all components of the temporary bypass system, including all piping and appurtenances, to ensure the system is operating as specified and no leakage or damage is occurring.
   2. Observation of the suction and discharge locations of the temporary bypass pumping system, including upstream and downstream sewers, to ensure flow levels are as expected and no surcharging of the sewer or damage is occurring.
   3. Verification of adequate fuel supply.

B. Inspections shall be documented in the operation log at the time that the inspection is performed.

3.6 PROTECTION

A. Protect temporary bypass pumping systems from traffic in proximity to system components and vandalism. Repair or replace damaged components immediately.

3.7 MAINTENANCE

A. Ensure that the temporary bypass pumping system is properly maintained in accordance with the Temporary Bypass Pumping Plan and manufacturer recommendations. There shall be no leakage from the temporary bypass pumping system.

B. Sufficient spare parts for pumps and piping shall be kept on site to maintain operation of the redundant system. Immediately replace spare parts that are placed into service.

3.8 DISASSEMBLY AND REMOVAL

A. When bypass operations are complete, bypass piping shall be flushed with fresh water and drained into the wastewater system prior to disassembly. Piping shall be disassembled in a manner to prevent an SSO.

B. Upon completion of the bypass pumping operations, and after the receipt of written permission from CFPUA, the Contractor shall disassemble and remove piping and restore property to pre-construction condition.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 02100

SITE PREPARATION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. This section covers clearing, grubbing, and stripping along the construction sites.

B. The Contractor shall clear and grub all of the area within the limits of construction or as required, which includes, but is not limited to, utility easements (servitudes) The width of the area to be cleared shall be reviewed by the Engineer prior to the beginning of any clearing.

C. The Contractor's attention is directed to any Soil Erosion and Sediment Control Ordinances in force in the Parish. The contractor shall comply with all applicable sections of these ordinances.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02220: Excavation, Backfill, Fill and Grading for Structures

B. Section 02221: Earth Excavation and Backfill in Trenches

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 CLEARING

The surface of the ground, for the area to be cleared and grubbed, shall be completely cleared of all timber, brush, stumps, roots, grass, weeds, rubbish, and all other objectionable obstructions resting on or protruding through the surface of the ground. However, those trees which are designated by the Engineer shall be preserved as hereinafter specified. Clearing operations shall be conducted so as to prevent damage to existing structures and installations, and to those under construction, so as to provide for the safety of employees and others.

3.02 GRUBBING

Grubbing shall consist of the complete removal of all stumps, roots larger than 1-1/2 inches in diameter, matted roots, brush, timber, logs, and any other organic or metallic debris not suitable for foundation purposes, resting on, under or protruding through the surface of the ground to a depth of 18 inches below the subgrade. All depressions

excavated below the original ground surface for or by the removal of such objects, shall be refilled with suitable materials and compacted to a density conforming to the surrounding ground surface.

3.03 STRIPPING

In areas so designated, topsoil shall be stockpiled. Topsoil so stockpiled shall be protected until it is placed as specified. Any topsoil remaining after all work is in place shall be disposed of by the Contractor.

3.04 DISPOSAL OF CLEARED AND GRUBBED MATERIAL

The Contractor shall dispose of all material and debris from the clearing and grubbing operation by hauling such material and debris off site. The cost of disposal (including hauling) of cleared and grubbed material and debris shall be considered a subsidiary obligation of the Contractor; the cost of which shall be included in the contract prices for the various classes of work.

3.05 PRESERVATION OF TREES

Those trees which are designated for preservation by the Engineer shall be carefully protected from damage. The Contractor shall erect such barricades, guards, and enclosures as may be considered necessary for the protection of the trees during all construction operations.

3.06 PRESERVATION OF DEVELOPED PRIVATE PROPERTY

A. The Contractor shall exercise extreme care to avoid unnecessary disturbance of developed private property along the route of the construction. Trees, shrubbery, gardens, lawns, and other landscaping, which in the opinion of the Engineer must be removed, shall be replaced and replanted to restore the construction easement to the condition existing prior to construction.

B. Improvements to the land, such as fences, walls, outbuildings, and other structures which of necessity must be removed, shall be replaced with equal quality materials and workmanship.

C. The Contractor shall clean up the construction site across developed private property directly after construction is completed, upon approval of the Engineer.

3.07 PRESERVATION OF PUBLIC PROPERTY

The appropriate paragraphs of Articles 17.01, 17.02 and 17.03 of these specifications shall apply to the preservation and restoration of public lands, parks, rights-of-way, easements, servitudes, and all other damaged areas.

END OF SECTION

SECTION 02140

DEWATERING

PART 1 - GENERAL

1.01 SCOPE

This section shall include supplying materials, equipment, services, and labor necessary to prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area. The Contractor shall dewater and dispose of the water so as not to cause injury to public or private property, or to cause a nuisance or a menace to the public. It shall be the sole responsibility of the Contractor to have adequate equipment and personnel at the site at all times to comply with these requirements.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01390: Excavation Plan.

B. Section 02220: Excavation, Backfill, Fill and Grading

C. Section 02221: Earth Excavation and Backfill in Trenches

1.03 SUBMITTALS

Prior to beginning dewatering operations, and as a part of the excavation plan, the Contractor shall submit, in writing to the Engineer, his proposed plan to comply with the requirements of this section. Submittal shall contain proposed equipment, methods of conveyance, and discharge point for water removed from excavations.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 INSTALLATION

The Contractor shall install all equipment necessary for dewatering. He shall have on hand, at all times, sufficient pumping equipment and machinery in good working condition and shall have available, at all times, competent workmen for the operation of the pumping equipment. Adequate standby equipment shall be kept available at all times to insure efficient dewatering and maintenance of dewatering operation during power failures.

3.02 PERFORMANCE

The control of groundwater shall be such that softening of the bottom of excavations or formation of unstable conditions during excavation shall be prevented. Dewatering systems shall be designed and operated to prevent erosion of the natural soils. Care shall be taken to prevent disturbance, due to the method of dewatering, of pipe bedding already in place in the trench. The Contractor is fully responsible for maintaining the integrity of previously placed pipe and bedding during dewatering and the release of groundwater.

During excavation, construction of structures, installation of pipelines, placement of the structure and trench backfill, and the placing and setting of concrete, excavations shall be kept free of water. The Contractor shall control surface runoff to prevent entry or collection of water in excavations. The static water level shall be controlled in the vicinity of the excavation to maintain the undisturbed state of the foundation soils and allow the placement of any fill or backfill to the required density. The dewatering system shall be installed and operated so that the groundwater level outside the excavation is not altered to an extent that would damage or endanger adjacent structures or property.

3.03 RELEASE OF GROUNDWATER

The release of groundwater to its static level shall be performed in such a manner as to maintain the undisturbed state of the natural foundation soils, prevent disturbance of compacted backfill and prevent flotation or movement of structures, pipelines, and sewers.

3.04 PAYMENT

All work in this section shall be considered a subsidiary obligation of the Contractor and all costs in connection therewith shall be included in the price for the associated items bid.

END OF SECTION

SECTION 02160

SHEETING, SHORING, AND BRACING

PART 1 - GENERAL

1.01 SCOPE

This section shall include supplying materials, services, and labor necessary to provide sheeting, shoring, and bracing or supports as required to provide a safe working condition for Contractor's personnel and to provide for protection of utilities, buildings, and structures. It shall be the sole responsibility of the Contractor to comply with these requirements.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01390: Excavation Plan

B. Section 02140: Dewatering

C. Section 02220: Excavation, Backfill, Fill and Grading for Structures

D. Section 02221: Earth Excavation and Backfill in Trenches

1.03 SUBMITTALS

Prior to beginning sheeting and shoring operations, and as a part of the excavation plan, the Contractor shall submit, in writing to the Engineer, his proposed plan to comply with the requirements of this Section. The Contractor is solely responsible to design, provide, install and maintain support systems required to complete the work in a continuous safe manner. The submitted plan shall be designed and stamped by a Louisiana Registered Civil or Structural Engineer. The submittal shall also include but is not limited to information on driving method, driving equipment, leads and other equipment utilized directly during the sheeting, shoring and bracing operations. No excavation work shall be allowed to commence until the Contractor has fulfilled this requirement and received written approval to proceed from the Engineer. Refer to Section 01390 for terms of any soil or pre-bid data supplied by the owner or Engineer.

1.04 SAFETY REQUIREMENTS

All sheeting, shoring, and bracing of excavations shall conform to requirements necessary to comply with local codes and authorities having jurisdiction.

Sheet pile installations will cause vibrations that may affect existing residences or underground utilities in the vicinity of the proposed excavation. Peak particle velocities due to sheet pile installation shall be monitored at critical locations with a seismograph

during the installation of sheet piles. The record of peak particle velocities will provide information in assessing the need for changes in driving operations and the types of changes best suited for the project requirements. Monitoring will be performed by an independent testing lab retained by the Owner. No driving operations shall take place without vibration monitoring on site and in place.

PART 2 - PRODUCTS

2.01 WOOD SHEETING

Wood for shoring and sheeting shall be green, rough cut hardwood (i.e. oak or hickory) Planking for sheeting and foundation lumber shall have a minimum thickness of 2 inches.

2.02 STEEL SHEETING

Steel sheet piling shall be a continuous interlock design. The sheet piling must, be in good condition and shall provide a tight interlocking connection which will retard the infiltration of ground water. Steel sheeting is recommended at all deep lift station and force main installations.

PART 3 - EXECUTION

3.01 PERFORMANCE

The planning, installation and removal of all sheeting, shoring, bracing, and sheet piling shall be accomplished in such a manner as to maintain the required trench or excavated cross section and to maintain the undisturbed state of the soils adjacent to the trench and below the excavated bottom. All trenches and structural excavations shall be properly sheeted, shored and braced.

The use of horizontal strutting below the barrel of a pipe or structure or the use of a pipe as support for trench bracing will not be permitted.

Wood sheeting shall be left in place and the upper part of the sheeting shall be cut off 3 feet below the finished ground surface after backfilling. All bracing above this level shall also be removed. Lower bracing shall be left in place.

Steel Sheeting shall be driven and extracted by either the vibratory or push/pull methods only. Impact driving or jetting shall not be allowed unless approved by the Engineer.

Steel sheeting, when determined necessary by the Contractor or when directed by the Engineer, shall be left in place and the upper part of sheeting shall be cut off 3 feet below the finished ground surface after backfilling. All bracing above this level shall be removed. The right of the Engineer to order sheeting and bracing left in place shall not be

construed as creating any obligation on his part to issue such orders, and his failure to exercise his right to do so shall not relieve the Contractor from liability for damages to persons or property occurring from or upon the work occasioned by negligence or otherwise, growing out of a failure on the part of the contractor to leave in place in the trench sufficient sheeting and bracing to prevent any caving or moving of the ground adjacent to the sides of the trench.

Steel sheeting or piling which are withdrawn shall be extracted in a manner so as to prevent subsequent settlement of the pipe or produce additional loadings to the structure and to maintain the undisturbed state of the soil adjacent to the trench or in the immediate area.

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.01 STATUTORY REQUIREMENTS

All excavation, trenching, sheeting, bracing, etc. shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926.650 Subpart P).

1.02 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required and perform all excavation work and grading; place and compact backfill and fill; and dispose of unsuitable waste and surplus materials as shown oil the Drawings and as specified herein.

B. Provide the services of a licensed professional engineer, registered in the State in which the work is located, to prepare temporary excavation support system designs and submittals.

C. Furnish and install temporary excavation support systems, including sheeting, shoring and bracing, to insure the safety of personnel and protect adjacent structures, piping, etc, in accordance with Federal, State and local laws, regulations and requirements.

1.03 RELATED WORK

A. Dewatering and Drainage is included in Section 02140.

B. Sheeting, Shoring and Bracing Section 02160.

C. Roadway and Street Restoration is included in Section 02500.

1.04 SUBMITTALS

Excavation support system designs shall be prepared by a licensed professional engineer registered in the State in which the work is located, having a minimum of 5 years of professional experience in the design and construction of excavation support systems. Submit an original and three copies of the licensed professional engineer's certification, stating that the excavation support systems designs have been prepared by the professional engineer and that the professional engineer will be responsible for their execution. Do not submit excavation support system designs unless requested in writing.

1.05 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM D698 - Test Method for Laboratory Compaction Characteristics of Soils Using Standard Efforts.
2. ASTM D1557 - Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.

B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.06 QUALITY ASSURANCE

A. At all structures, prior to the placement of bedding material, concrete work mats, structural fill or structural concrete, coordinate with the soils testing laboratory to verify the suitability of the existing subgrade soil and to perform in-place soil density tests as required to verify that the bearing capacity of the subgrade is sufficient.

B. Prior to and during the placement of backfill and fill coordinate with the soils testing laboratory to perform in-place soil density tests to verify that the backfill/fill material has been compacted in accordance with the compaction requirements specified elsewhere. The Engineer may designate areas to be tested.

1.07 DEFINITIONS

A. Where the phrase "in-the-dry" is used in this Section, it shall be defined to mean a soil condition such that the in-place moisture content of the soil at that time is no more than two percentage points above the optimum moisture content of that soil as determined by the laboratory test of the moisture-density relation appropriate to the specified level of compaction.

B. Where used in this Section "structures" refers to all buildings, wet wells, manholes and below grade vaults. Storm water structures and duct banks are not considered structures in this context.

PART 2 - PRODUCTS

2.01 GENERAL

Timber used for excavation support systems shall comply with the requirements of Section 02160.

PART 3 – EXECUTION

3.01 PREPARATION

A. Test Pits

1. Perform exploratory excavation work (test pits) for the purpose of verifying the location of underground utilities and structures and to check for unknown utilities and structures, prior to commencing excavation work.
2. Test pits shall be backfilled as soon as the desired information has been obtained. Backfilled surfaces shall be stabilized in accordance with approved erosion and sedimentation control plans.

B. Dewatering and Drainage Systems

Temporary dewatering and drainage systems shall be in place and operational prior to beginning excavation work.

3.02 EXCAVATION SUPPORT

A. Furnish, install, monitor and maintain excavation support (e.g., shoring, sheeting, bracing, trench boxes, etc) as required by Federal, State or local laws, ordinances, regulations and safety requirements. Support the sides of excavation, to prevent any movement which could in any way reduce the width of the excavation below that necessary for proper construction and protect adjacent structures from undermining, settlement or other damage. Take care to prevent the formation of voids outside of sheeting. If voids occur behind sheeting, immediately backfill and compact the voids with common fill material. Voids in locations that cannot be properly compacted upon backfilling shall be filled with lean concrete.

B. Install excavation supports outside the neat lines of foundations. Supports shall be plumb and securely braced and tied in position. Excavation support shall be adequate to withstand all pressures to which the supports will be subjected. Any movement or bulging of supports shall be corrected to provide the necessary clearances, dimensions and structural integrity.

C. Excavation supports shall be carefully removed in such manner so as not to endanger the Work or other adjacent structures, utilities, or property. All voids left or caused by withdrawal of supports shall be immediately filled with sand and compacted.

3.03 STRUCTURAL EXCAVATION PROCEDURES

A. Excavations for structures shall be suitably wide for construction of the structures, including excavation supports, dewatering and drainage systems and working clearances.

B. Excavation shall be performed in-the-dry and shall be accomplished by methods which preserve the undisturbed state of subgrade soils. Drainage and dewatering systems shall be in place and operational prior to beginning excavation work. In no

case shall the earth be plowed, scraped or excavated by any means so near to the finished subgrade that would disturb the finished subgrade. Hand excavation of the final 3 to 6-in may be required to obtain a satisfactory, undisturbed subgrade. Subgrade soils which become soft, loose, "quick", or otherwise unsatisfactory for support of structures as a result of inadequate excavation, dewatering, or other construction methods shall be removed and replaced with lean concrete, compacted structural fill or suitable crushed rock, subject to prior approval by the Engineer, at no additional cost to the Owner.

C. Subgrade Preparation

1. All structures unless otherwise shown on the Drawings or otherwise specified herein: Compact the top 12-in of subgrade to a minimum of 95 percent modified proctor (ASTM D1557).
2. Where existing subgrade contains a significant amount of clay or cohesive soils, over-excavate sufficiently below the bottom of structure for placement of a lean concrete working mat. Prior to placing the lean concrete working mat, compact the top 12-in of existing subgrade to a minimum of 95 percent modified proctor (ASTM D1557).

D. When excavations have reached the required subgrade, including any allowances for working mats or base materials, prior to the placement of working mats or base materials, notify the soils testing laboratory to verify the suitability of the existing subgrade soils for the anticipated foundation and structural loadings. If the existing subgrade soils are determined to be unsuitable, direction will be provided by the Engineer regarding removal and replacement with suitable materials. If Contractor believes that such direction would increase Contractor's cost and would thereby entitle Contractor to a change in Contract cost. Contractor shall notify the Engineer in accordance with the applicable article(s) in the General Conditions pertaining to changes in the work.

E. Over-excavation beyond the limits and depths required by the Contract Documents shall be replaced at no additional cost to the Owner by lean concrete or structural fill or other approved material subject to the prior approval of the Engineer.

3.04 GENERAL FILLING AND BACKFILLING PROCEDURES

A. Fill and backfill materials shall be placed in lifts to suit the specified compaction requirements to the lines and grades required, making allowances for settlement and placement of cover materials (i.e. topsoil, sod, etc). Soft spots or uncompacted areas shall be corrected.

B. Compaction in open areas may be accomplished by any of the following methods: compaction equipment, fully loaded ten-wheel trucks, tractor dozers weighing at least 30,000 lbs and operated at full speed, or heavy vibratory rollers. Compaction in confined areas (including areas within a 45 degree angle extending upward and outward from the base of a wall) and in areas where the use of large equipment is

impractical, shall be accomplished by hand operated vibratory equipment or mechanical tampers. Lift thickness shall not exceed 6-in (measured before compaction) when hand operated equipment is used.

C. Fill and backfill shall not be placed and compacted when the materials are too wet to properly compact (i.e. the in-place moisture content of the soil at that time is no more than three percentage points above the optimum moisture content of that soil as determined by the laboratory test of the moisture-density relation appropriate to the specified level of compaction).

3.05 FILL AND BACKFILL PROCEDURES

A. Fill and backfill material placed immediately adjacent to and within 10-ft of all structures shall be select fill. All structure water-tightness tests and damp proofing /waterproofing shall be completed prior to placing fill or backfill around structures. Place and compact select fill in even lifts of 6-in (compacted thickness) uniformly around the structure.

B. Common fill maybe used in areas beyond those designated for select fill unless, shown or specified otherwise. Common fill shall be placed in even lifts having a maximum thickness (measured before compaction) of 12-in.

C. Fill required beneath building slabs or slabs on grade (except sidewalks) shall be structural fill. Place and compact structural fill in even lifts of 6-in (compacted thickness).

3.06 COMPACTION REQUIREMENTS

A. 10-ft around structures: Compact the top 12-in of existing subgrade and each layer of fill or backfill to a minimum of 92 percent modified proctor (ASTM D1557) at or near its optimum moisture content (minus 2 to plus 3 percent).

B. Embankments (except under roadways), lawn or unimproved areas: Compact the top 6-in of existing subgrade and each layer of fill or backfill to a minimum of 92 percent standard proctor (ASTM D698) at or near its optimum moisture content (minus 1 to plus 4 percent).

C. Beneath building slabs and slabs on grade (except sidewalks): Compact the top 12-in of existing subgrade (and each layer of fill if applicable) to a minimum of 95 percent modified proctor (ASTM D1557) at or near its optimum moisture content (minus 2 to plus 3 percent).

D. Sidewalks: Compact the top 6-in of existing subgrade (and each 6-in layer of fill if applicable) to a minimum of 95 percent modified proctor (ASTM D1557) at or near its optimum moisture content (minus 2 to plus 3 percent).

E. Roads, paved areas and roadway embankments: Compact the top 12-in of existing subgrade and each layer of fill or backfill to a minimum of 95 percent modified proctor (ASTM D1557) at or near its optimum moisture content (minus 2 to plus 3 percent).

3.07 DISPOSAL OF UNSUITABLE, WASTE AND/OR SURPLUS EXCAVATED MATERIAL.

Unsuitable, waste and surplus excavated material shall be removed and disposed of off-site. Materials may be temporarily stockpiled in an area within the limits of construction that does not disrupt construction activities, create any nuisances or safety hazards, or otherwise restrict access to the work site.

END OF SECTION

SECTION 02220

EXCAVATION, BACKFILL, FILL AND GRADING FOR STRUCTURES

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Structural excavation shall consist of the removal of material for the construction of foundations for launching and receiving pits for horizontal directional drilling, and other excavation designated on the plans or in these specifications.

B. Structural excavation and backfill shall consist of furnishing material, if necessary, and placing and compacting backfill material around structures to the lines and elevations designated on the plans or specified or directed by the Engineer.

C. Structural excavation and backfill shall include the furnishing of all materials, equipment and incidentals which may be necessary to perform the excavations, place and compact the backfill, sheeting, bracing, and dewatering necessary. It shall also include the wasting or disposal of surplus excavated material in a manner and in locations approved by the Engineer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01390: Excavation Plan

B. Section 01410: Testing Laboratory Services

C. Section 02221: Earth Excavation and Backfill in Trenches

D. Section 03100: Concrete Formwork

1.03 QUALITY

A. Testing Agency:

In-place soil compaction tests to be performed by testing laboratory employed by Owner.

B. Reference Standards:

1. American Society for Testing and Materials (ASTM):

a. ASTM C 127, Density, Relative Density, and Absorbtion of Coarse Aggregate.

b. ASTM D 1557, Moisture-Density Relations of Soils Using 10-lb (4.5-kg) Hammer and 18-in (457-mm) Drop.
c. ASTM D 2487, Classification of Soils for Engineering Purpose.
d. ASTM D 4253, Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
e. ASTM D 4254, Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.

1.04 JOB CONDITIONS

A. Time of construction should be kept to a minimum.

B. Sheeting, shoring and dewatering during construction should be properly designed to keep a stable excavation at all times to prevent disturbance of the in-place soils.

C. As specified in Section 02221, the Contractor shall provide, operate and maintain all necessary pumps, discharge lines, well points, etc., in sufficient number and capacity to keep all excavation, bases, pits, etc., in conformance with the indicated foundation construction condition at each structure at all times throughout the period of construction.

D. As specified in Section 02221, the Contractor shall assume all responsibility for security of the excavation required, employing bracing, lining or other accepted means necessary to accomplish same.

E. Excavated areas shall be cleared of all debris, water, slush, muck, and soft or loose earth and shall be conditioned to the entire satisfaction of the Engineer.

F. All excavated material unsuitable for use or which will not be used shall be removed from the site of the work by the Contractor. The Contractor shall remove and dispose of excess backfill material, at his expense.

G. All excavations encountering stumps, roots, logs, etc., at the grade of the pit shall be removed of such designated bottom items by the Contractor and refilled with proper material.

PART 2 - PRODUCTS

2.01 SELECT FILL

Select fill shall be used as backfill material for trenches in unpaved areas. When a water or sewer structure will be or is located in a non-paved area, select fill placed around the top of a water or sewer structure shall have a maximum thickness of six inches (6"). Select fill materials shall be a good quality silty or clayey sand, free of roots, shells, or any other foreign matter, and shall have and AASHTO Group Classification of A-2-4. In-

situ materials removed during excavation maybe used as select fill if the in-situ materials meet the requirements stated above.

2.02 CLEAN SAND

Clean sand shall be used for pipe bedding, pipe backfill and backfill around subsurface structures. Additionally, clean sand shall be used as backfill material under streets, state highways and driveways. Clean sand materials shall be a good quality "River Sand", free of roots, shells, or any other foreign matter, and shall have and AASHTO Group Classification of A-3.

2.03 CRUSHED LIMESTONE

A. Pipe Foundations: When soft and/or saturated soils are present in the trench bottom, a crushed limestone pipe foundation shall be used to stabilize the trench bottom. Crushed limestone used as pipe foundation material shall be from a source approved by the LA DOTD. Materials shall conform to the LA DOTD gradation for #57 crushed aggregates. Relative densities of 75% to 90%, in accordance with ASTM D 4253 and D4254, shall be required for pipe foundation.

B. Structural Bedding: Manholes, wet wells, and valve vaults shall be bedded on a crushed limestone base. Crushed limestone used as bedding material shall be from a source approved by the LA DOTD. Materials shall conform to the LA DOTD gradation for #57 crushed aggregates. Relative densities of 75% to 90%, in accordance with ASTM D 4253 and D4254, shall be required.

2.04 GEOTEXTILE FABRIC

The contractor shall furnish geo-textile fabric that conforms with Section 1019 of the Louisiana Standard Specifications for Roads and Bridges, placed in accordance with the details shown on the plans.

2.05 GEO-GRID

The contractor shall furnish a bi-axial geo-grid to be used along the trench bottom and as shown on the Standard Details. Geo-grid shall be a Tensar BX1200 or Syntec SBX12. The contractor shall submit product data other geo-grid materials to the Engineer for review and approval prior to the start of construction.

PART 3 - EXECUTION

3.01 INSPECTION

A. The Contractor shall verify that preceding work affecting work of this Section has been satisfactorily completed.

B. Correct conditions adversely affecting work of this section.

3.02 REMOVAL OF UNSUITABLE MATERIALS

A. The Contractor shall remove unsuitable material from within the limits of the work specified in this section.

B. Materials meeting requirements for approved fill for pipe installations shall be stockpiled as necessary and in such a manner satisfactory to the Engineer. Excavated material will not be allowed as backfill material around structures.

C. All material excavated shall be placed so as to minimize interference with public travel and to permit proper access for inspection of the work.

END OF SECTION

SECTION 02221

EARTH EXCAVATION AND BACKFILL IN TRENCHES

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. This section includes, except as elsewhere provided, trenching for installation of pipelines and appurtenances, including drainage, filling, 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, Contractor shall confine his 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 sheeting, bracing, and supports and shall remove from the excavation all materials which are unsuitable for backfill or which the Engineer may deem unsuitable for backfilling. The bottom of the excavation shall be firm, dry, and in all respects, acceptable. The Contractor shall deposit limestone for pipe bedding, or limestone refill for excavation below grade, directly on 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.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01390: Excavation Plan

B. Section 02160: Sheeting, Shoring, and Bracing

C. Section 02220: Excavation, Backfill, Fill and Grading for Strucutures

PART 2 - PRODUCTS

2.01 SELECT FILL

Select fill shall be used as backfill material for trenches in unpaved and un-improved areas. Select fill materials shall be a good quality silty or clayey sand, free of roots, shells, or any other foreign matter, and shall have and AASHTO Group Classification of A-2-4. In-situ materials removed during excavation maybe used as select fill if the in-situ materials meet the requirements stated above.

2.02 CLEAN SAND

Clean sand shall be used for pipe bedding and pipe backfill. Additionally, clean sand shall be used as backfill material under streets, state highways and driveways. Clean sand materials shall be a good quality "River Sand", free of roots, shells, or any other foreign matter, and shall have and AASHTO Group Classification of A-3.

2.03 CRUSHED LIMESTONE PIPE FOUNDATION

When soft and/or saturated soils are present in the trench bottom, a crushed limestone pipe foundation shall be used to stabilize the trench bottom. Crushed limestone used as pipe foundation material shall be from a source approved by the LA DOTD. Materials shall conform to the LA DOTD gradation for #57 crushed aggregates. Relative densities of 75% to 90%, in accordance with ASTM D 4253 and D4254, shall be required for pipe foundation.

2.04 GEOTEXTILE FABRIC

The contractor shall furnish geo-textile fabric that conforms with Section 1019 of the Louisiana Standard Specifications for Roads and Bridges, placed in accordance with the details shown on the plans.

2.05 GEO-GRID

The contractor shall furnish a bi-axial geo-grid to be used along the trench bottom and as shown on the Standard Details. Geo-grid shall be a Tensar BX1200 or Syntec SBX12.

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. In case the excavation for any pipeline, is ordered by the Engineer to be carried below the required depth, the Contractor shall fill the bottom of the excavation up to grade with bedding material, in a manner acceptable to the Engineer.

C. If the Contractor excavates below grade through error or for his own convenience, or through failure to properly dewater the trench, or disturbs the subgrade before dewatering is sufficiently complete, he may be directed by the Engineer 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 the Contractor's expense.

D. 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 or 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 which will not be used for backfill in the same location (i.e., streets) shall be removed from the site of the work by the Contractor. The Contractor shall remove and dispose of excess backfill material, at his expense.

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 re-handled and used in backfilling the trench or hauled to the owner's storage site.

3.03 EXCAVATION TO REMOVE STUMPS, ROOTS, 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. The Contractor shall fill this excavated space with bedding material.

B. When so required by the Engineer, the Contractor shall probe one foot (1') below the established bottom of the trench. If any stump, roots, logs, etc., are discovered by this probing, the Contractor shall cut them out just as if they had been visible in the trench.

C. Blasting will not be allowed for the removal of stumps.

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. No additional compensation will be made for any test pits or restoration and shall be considered incidental to the appropriate bid item.

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 must be accurately shaped, and the bedding material must be closely packed under and around the pipe.

B. The bedding and pipe shall be enclosed in a geotextile fabric meeting the requirements of section 2.05 of this specification. 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 the pipes are laid in developed areas, the trench shall be filled with approved backfill material to an elevation six inches (6") below the existing grade. The remainder of the trench shall be filled with top soil.

C. Where the pipes are laid in streets, the remainder of the trench above the bedding and up to the bottom of the specified paving shall be backfilled as shown on the drawings in layers not to exceed 2 feet, and shall be compacted to minimum 97% of maximum dry density at optimum water content in accordance with ASTM D-1557.

D. Backfill around manholes shall be compacted by flooding. All backfill shall be compacted, especially under and over pipes connected to the manholes.

E. Paving shall not be placed in backfill.

F. All road surfaces adjacent to back-filling operations shall be broomed and hose-cleaned immediately after backfilling. Dust control measures, as specified under Section 01560, shall be employed at all times.

3.07 RESTORING TRENCH SURFACE

A. Where the trench occurs adjacent to paved streets, in shoulders, sidewalks, or in cross-country areas, the Contractor shall thoroughly consolidate the backfill and shall maintain the surface as the work progresses. If settlement takes place, he shall immediately deposit additional fill to restore the level of the ground.

B. The surface of any driveway or any other area which is disturbed by the trench excavation, and which is not a part of the paved street, 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 grassed areas, the Contractor shall re-grade 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

THIS PAGE IS INTENTIONALLY BLANK

SECTION 02222

MODIFICATIONS TO EXISTING STRUCTURES, PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment, and incidentals to modify, alter and/or convert existing structures as shown or specified and as required for the installation of new mechanical equipment, piping, structures, and appurtenances.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

A. The Contractor shall cut, repair, excavate, demolish, or otherwise remove parts of the existing structures or appurtenances, as indicated on the Contract Drawings, herein specified, or necessary to permit completion of the work under this Contract. He shall dispose of surplus materials resulting from the above work in an approved manner. The work shall include all necessary cutting and bending of reinforcing steel, structural steel, or miscellaneous metal work found embedded in the existing structures.

B. The Contractor shall dismantle and remove all existing equipment, piping, and other appurtenances required for the completion of the work. Where called for or required, the Contractor shall cut existing pipelines for the purpose of making connections thereto. Anchor bolts for equipment and structural steel removed shall be cut off one inch below the concrete surface. Surface shall be finished as specified in Division 3.

C. At the time that a new connection is made to an existing pipeline, additional new piping, extending to and including a new valve, shall be installed.

D. No existing structure, equipment, or appurtenances shall be shifted, cut, removed, or otherwise altered except with the express approval of and to the extend approved by the Engineer.

E. When removing materials or portions of existing structures and when making openings in walls and portions, the Contractor shall take all precautions and use all necessary barriers and other protective devices so as not to damage the structures beyond the limits necessary for the new work and not to damage the structures or contents by falling or flying debris. Unless otherwise permitted, line drilling will be required in cutting existing concrete.

F. Materials and equipment removed in the course of making alterations and additions shall remain the property of the Owner, except that items not salvageable, as determined by the Engineer and the Owner shall become the property of the Contractor to be disposed of by

him off the work site at his own place of disposal. Operating equipment shall be thoroughly cleaned, lubricated, and greased for protection during prolonged storage.

G. All alterations to existing structures shall be done at such time and in such manner as will comply with the approved time schedule. So far as possible before any part of the work is started all tools, equipment, and materials shall be assembled and made ready so that the work can be completed without delay.

H. All workmanship and new materials involved in constructing the alterations shall conform to the General Specifications for the classes of work insofar as such specifications are applicable.

I. All cutting of existing concrete or other materials to provide suitable bonding to new work shall be done in a manner to meet the requirements of the respective section of these Specifications covering the new work. When not covered, the work shall be carried on in the manner and to the extent directed by the Engineer.

J. Surface of seals visible in the completed work shall be made to match as nearly as possible the adjacent surfaces.

K. Non-shrink grout shall be used for setting wall castings, sleeves, leveling pump bases, doweling anchors into existing concrete and elsewhere as shown.

L. Where necessary or required for the purpose of making connections, the Contractor shall cut existing pipelines in a manner to provide an approved joint. Where required, he shall weld beads, flanges, or provide Dresser Couplings, all as required.

M. The Contractor shall provide flumes, hoses, piping, and other related items to divert or provide suitable plugs, bulkheads, or other means to hold back the flow of wastewater, water, or other liquids, all as required in the performance of the work under this Contract.

N. Blasting will not be permitted.

3.02 CLEANING EXISTING STRUCTURES

A. After dewatering by Contractor and before commencing work on any structures, the Contractor shall remove and dispose of the debris and other solids remaining in such structures.

3.03 CONNECTING TO EXISTING PIPING AND EQUIPMENT

A. The Contractor shall verify exact location, material, alignment, joint, etc. of existing piping and equipment prior to making the connections called out in the Drawings. The verifications shall be performed with adequate time to correct any potential alignment or other problems prior to the actual time of connection.

B. The Contractor shall dismantle and remove all existing equipment, piping and other appurtenances required for the completion of the work. Were called for or required, Contractor shall cut existing pipelines for the purpose of making connections thereto. Anchor

bolts for equipment and structural steel removed shall be cut off one inch below the concrete surface. Surface shall be finished as specified in Division 3.

C. At the time that a new connection is made to an existing pipeline, additional new piping, extending to and including the most convenient new valve, shall be installed.

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 02272

GEOTEXTILE FABRIC

PART 1 - GENERAL

1.01 SCOPE

This work consists of furnishing all labor, materials, equipment and incidentals required to furnish and install the geotextile fabric at the locations shown on the plans, or as directed, in conformance with manufacturer's directions and these specifications.

1.02 SUBMITTALS

The characteristics and properties of the geotextile fabric to be installed shall be submitted to the Engineer prior to the installation of the fabric in accordance with Section 01340.

PART 2 - PRODUCTS

2.01 ACCEPTABLE PRODUCTS

The geotextile fabric should meet or exceed the material requirements for Class C geotextile fabric as presented in Section 1019.01 of the Louisiana Standard Specifications for Roads and Bridges, 2000 Edition.

2.02 MATERIALS

A. The geotextile fabric shall be a woven high strength fabric with high burst and puncture strength. It shall be a woven fabric composed of at least 85% by weight polyester, polyolefins or polyamides. Geotextile fabric shall meet the requirements as shown in the table below:

AOS US Sieve Min. (ASTM D4751)	50
Grab Tensile, lb., Min. (ASTM D4632-86)	130
Elongation, Min. (ASTM D4632-86)	50%
Burst Strength, psi., Min. (ASTM D3787)	210
Trapezoidal Tear, lb., Min. (ASTM D4533)	40
Puncture Resistance, lb., Min. (ASTM D4833)	40
Permittivity Sec min. (ASTM D4491)	1.0
Strength Retained at 150 hr. weatherometer, % min. (ASTM D4632; DOTD TR)	70

B. The manufacturer of the geotextile fabric shall have been normally engaged in the manufacture of the fabrication of this geotextile fabric for at least five continuous years.

2.03 FABRICATION

The geotextile fabric shall be furnished to the Contractor by the manufacturer as a continuous sheet in the widths required for installation in the trench. The length of each sheet shall be such that the total numbers of sheets to be joined in the field are minimized.

PART 3 - EXECUTION

3.01 HANDLING

A. The Contractor shall handle and store the sheets in accordance with the recommendations of the manufacturer to avoid any damage. Geotextile fabric shall be stored such that it is not exposed to sunlight.

B. Damaged geotextile fabric will not be acceptable for installation until and unless it has been replaced to the satisfaction of the Engineer.

3.02 INSTALLATION

A. The geotextile fabric shall be placed without folds or wrinkles and in accordance with manufacturer's recommendations. Laps shall be as recommended by the manufacturer but in no case shall be less than 24".

B. The recommendations of the manufacturer shall be followed during the installation of the fabric. Care shall be taken during pipe laying, embedment and backfilling operations to avoid damage to the geotextile fabric. Any portion of the fabric damaged during installation shall be removed and replaced or repaired to the satisfaction of the Engineer prior to continuing the installation of the geotextile fabric.

C. Field Joints. The number of field joints shall be minimized. Lap joints shall be used to join sections in the field.

END OF SECTION

SECTION 02350

STONE BASE COURSE

PART 1 - GENERAL

This material shall meet the requirements of Sections 1003.02, 1003.01 and 1003.03(d) (stone or crushed stone) of the latest edition of the Louisiana Department of Transportation and Development Standard Specifications for Roads and Bridges. It shall be compacted to 95% of ASTM D-698. This material shall be used as base course and as temporary street and drainage maintenance.

PART 2 - PRODUCT (NOT USED)

PART 3 - EXECUTION

Contractor is to compact the subgrade to the appropriate density of adjacent ground. He is to install a layer of compacted stone/crushed stone to the thickness, lines and grades shown on the drawings or as directed by the Engineer.

END OF SECTION

SECTION 02350

STONE BASE COURSE

PART 1 - GENERAL

This material shall meet the requirements of Sections 1003.02, 1003.01 and 1003.03(d) (stone or crushed stone) of the latest edition of the Louisiana Department of Transportation and Development Standard Specifications for Roads and Bridges. It shall be compacted to 95% of ASTM D-698. This material shall be used as base course and as temporary street and drainage maintenance.

PART 2 - PRODUCT (NOT USED)

PART 3 - EXECUTION

Contractor is to compact the subgrade to the appropriate density of adjacent ground. He is to install a layer of compacted stone/crushed stone to the thickness, lines and grades shown on the drawings or as directed by the Engineer.

END OF SECTION

SECTION 02500

ROADWAY AND STREET RESTORATION

PART 1 - GENERAL

1.01 DESCRIPTION

This section shall include the construction or reconstruction of all paved and unpaved roadway and walkway areas encountered on the project. This work will include replacement of pavements, shell surfaces, base courses, curbs, gutters and other improvements removed or damaged by the Contractor during the course of his contract.

All construction materials and procedures shall conform to the Louisiana Standard Specifications for Roads and Bridges (DOTD), 2000 Edition and revisions to date, unless otherwise specified.

Also, drawings included in these contract documents reflect "typical roadway restoration details".

Concrete roadway directly affected during construction or damaged as the result of the Contractor's operation shall be removed and replaced from joint to joint unless otherwise directed by the Engineer's approval in consultation with the Department of Public Works.

Bituminous pavement sections replaced shall be saw cut at the limits for removal.

All pavements or other surfacing of roadways, sidewalks, and driveways, which are damaged by the construction activities, shall be replaced to its preconstruction conditions or better.

NOTICE: The Contractor is responsible for notifying the Department of Engineering at St. Tammany Parish Government, at least 24 hours in advance, of any placement of concrete or asphalt.

1.02 SUBMITTALS

The Contractor shall make submittals, for approval by the Engineer, on the following items:

1. Base course material.
2. Asphalt mix design.
3. Concrete mix design.
4. Load transfer devices.
5. Joint material.

PART 2 - MATERIALS

2.01 BASE COURSE

This work consists of furnishing and placing granular material for the roadway base as per plan details and paving schedules, and in accordance with Section 723 and 301 of the Louisiana Standard Specifications for Roads and Bridges, 2000 Edition, unless otherwise specified.

The placement of the road base material shall be confined to the limits of the trench line. If, due to the construction operation, the adjacent base material is disturbed adversely, the Contractor shall remove and replace the material as directed by the Engineer in consultation with St. Tammany Parish Government

Density tests will be taken on the roadway base materials as directed in the general notes on the plans. The Contractor shall not be allowed to restore the roadway until backfill material in the trench area meets or exceeds the following:

Density Requirements (Standard Proctor)

a. Base Course (sand) - 97%
b. Base Course (sand) - 97%
c. Base Course (stone) - 95%
d. Subbase (sand) - 97%

It will be the Contractor's responsibility to fill void areas in the existing road base material with compacted sand to establish a level uniform surface. This cost shall be included in the unit price for pavement work.

2.02 ASPHALT CONCRETE PAVING

All materials and construction under this section shall conform to Section 501 of the Louisiana Specifications for Roads and Bridges, 2000 Edition, unless otherwise specified. The gradation of the mix shall be Type 3, AC-30 for the Wearing Course and Binder Course, Type 5A, AC-30 for the Base Course as specified in Table 1 of the referenced section. The thickness of each course is as shown in the paving schedule. Saw cutting will be required along the entire limits of the removed asphalt areas.

2.03 CONCRETE PAVEMENT

All materials and construction under this section shall conform to Section 601 of the Louisiana Standard Specifications for Roads and Bridges, 2000 Edition, unless otherwise specified.

All existing concrete curb, walks, and driveways shall be replaced with concrete to the line and grade as directed by the Engineer and to a thickness as indicated on the typical details as shown on the plans. Prior to construction in an area, the Contractor shall adequately

reference the existing curb and other pavement elevations to establish the preconstruction elevation. These pavement elevations shall be submitted to the Engineer for review and possible modification to improve drainage. Portland cement concrete pavement for patching shall be 10" minimum thickness with a base course 8" thick. All concrete used for patching shall be high early strength (3800 psi) concrete (24 hr curing).

The restored paving elevations shall correspond to the elevations established prior to construction in the area, or as modified by the Engineer, to allow for drainage of the area.

Curbs and sidewalks shall be saw cut and removed to the nearest joint scorings. All concrete streets and driveways shall be removed from joint to joint.

Portland Cement Concrete Requirements for roadway pavements and curbs:

a. Seven (7) sacks of cement per cubic yard
b. 2" to 4" slump range
c. The use of Fly Ash in the mix will not be permissible.

The pavement shall not be opened to traffic until a compressive strength of 4,000 psi is attained and in no case shall the pavement be opened to traffic within a three (3) day period after the concrete has been placed.

The final roadway surface finish shall be a "Drag Finish" as defined in the Louisiana Standard Specifications for Roads and Bridges, 2000 Edition, or as otherwise directed by the Department of Public Works.

PART 3 - EXECUTION

3.01 GENERAL

Unless otherwise approved by the Engineer, the kind of pavement to be constructed in replacement work shall correspond with the kind removed from the area. The respective kind of concrete (asphalt or portland cement) shall be placed, shaped, compacted, and finished to establish grade and cross section by practicable means which will result in a dense, uniform-textured pavement. Abutting edges of old pavement shall be trimmed of all loose fragments and shall be painted with asphalt or thoroughly moistened with water, as appropriate, to provide good bond between the old and new pavement.

All manholes within the pavement area shall be isolated (boxed out) by means of an approved circular ring (joint) around them, square or rectangular sections using flexible joint material.

Transverse (expansion or contraction), longitudinal and construction joints shall all be installed in accordance with the standard details included in the contract documents.

In cases where a section of roadway to be restored abuts an existing roadway, all transverse or longitudinal joints shall line up and be of the same type as the existing (expansion, contractions, etc.).

3.02 SPECIAL PAVING REQUIREMENTS

To provide for the comfort and safety of the traveling public, it is the Contractor's responsibility to backfill, with sand/shell material, up to the top of the adjacent pavement and maintain it at that elevation until the roadway is closed to traffic during the street restoration work.

Maintenance shall consist of re-grading a temporary sand/shell surface material and of restoring said surface to proper grade and cross section daily or more frequently, as directed by the Engineer, together with wetting as required for dust abatement.

At the time of placing the pavement, excess foundation material shall be removed and shall be disposed of in a satisfactory manner. Paving of any area shall be completed on the day it is started, and the area shall be placed in service at the earliest practicable time. The Contractor is responsible for maintaining access to the residents of the area and shall inconvenience the affected property owners as little as possible.

At no time shall pavement material be placed in water or on saturated base material.

All work to be performed under this section shall be conducted with regard for public safety and maintaining traffic flow.

3.03 CUTTING OF PAVEMENT FOR TRENCH PATCHES

Concrete pavement sections shall be removed joint to joint for trench work. Asphalt pavement structures shall be cut with a concrete saw along each edge of the area to be removed with the area being limited in width as shown in the plans.

Cuts shall be clean, vertical cuts made true to lines parallel to or at right angles of any existing curb line. Depths of the cuts shall be full-depth to permit the removal of pavement between or alongside them without damage to pavement or structures to be left in place. Any pavement damaged by the Contractor's operation shall be replaced at the Contractor's expense.

3.04 CURBS, GUTTERS, AND MISCELLANEOUS

Replacement of curbs, gutters, walks, and other like structures shall consist of similar and matching construction to that of adjoining undisturbed structures, which construction shall be at least equal in all respects to that of the structures or parts of structures removed in the work and as shown on the plans.

3.05 TESTING REQUIREMENTS

A. Asphalt Roadways

1. One base thickness verification per 600 square yards or fraction thereof.
2. One density test on the subbase (if applicable) and base material per 600 square yards or fraction thereof.
3. One pavement core for thickness verification per 600 square yards of pavement or fraction thereof.

B. Concrete Roadways

1. One slump test minimum per 100 cubic yards of concrete or fraction thereof.
2. Four (4) cylinders minimum per 100 cubic yards of concrete or fraction thereof.
3. Independent densities, slumps, cylinders, cores, etc., will be required for isolated areas.
4. All requirements of 3.05A above shall also apply to concrete roadways.

C. All initial testing shall be performed by the Parish's testing laboratory and at the Parish's expense. All costs for testing to determine compliance after the initial tests shall be borne by the Contractor and credit made to the Owner under change order to the contract.

D. There shall be no adjustment in bid prices for pavement thickness deficiencies. If the concrete core is less than specified, two additional cores on the same slab within a 5' radius must be taken. If one of these cores is less than specified, then the entire panel (joint to joint) must be removed and additional cores on other adjacent panels within the core range (600 square yards) must be taken and the same procedure followed.

E. Joint Sealer: All joints in roadway surface shall be cleaned and sealed with approved joint sealant.

3.06 CLEANING FOR ACCEPTANCE OF STREET

Prior to acceptance, the Contractor shall be required to clean up any street that is dirtied as a result of construction activity, as directed by the Project Engineer.

END OF SECTION

THIS PAGE IS INTENTIONALLY LEFT BLANK

SECTION 02505

HORIZONTAL DIRECTIONAL DRILL

PART 1 GENERAL

1.01 SCOPE OF WORK

The work specified in this section consists of furnishing and installing underground utilities using the horizontal directional drilling (HDD) method of installation for pipes of various sizes, also commonly referred to as directional boring or guided horizontal boring. This work shall include all services, equipment, materials, and labor for the complete and proper installation, testing, restoration of underground utilities and environmental protection and restoration.

1.02 CONTRACTOR QUALIFICATIONS

A. Contractor (or Sub-Contractor) shall provide documented evidence of successful installation of pipe through the horizontal directional drill method for work comparable in nature to the scope of work required by this project for a minimum of two years.

B. Contractor (or Sub-Contractor) to have successfully self-performed at least (5) horizontal directional drilling projects to install product pipe of a similar nominal diameter and length to the proposed project within the past two years. Owner and Engineer shall have the sole authority to determine the adequacy of the representative projects.

C. Contractor's (or Sub-Contractor's) project manager, superintendent, drill operator and guidance system operator assigned to horizontal directional drilling shall be experienced in work of this nature and shall have successfully completed projects similar in nature and shall have successfully completed similar projects using horizontal directional drilling. Contractor (or Sub-Contractor) shall submit substantiating evidence of qualifications with the bid submittal documents.

D. All drilling, drill guidance and pipe joining equipment operators shall be experienced in comparable horizontal directional drilling work, and shall have been fully trained in the use of the proposed equipment by an authorized representative of the equipment manufacturer(s) or their authorized training agents.

E. All high density polyethylene (HDPE) fusion equipment operators shall be qualified to perform pipe joining using the means, methods and equipment employed by the Contractor. Fusion equipment operators must possess and be able to provide written validation (card or certificate) of current, formal training on all fusion equipment employed on the project, including training and proper use of the

data logging device on the equipment. Training received more than two years prior to operation of the fusion equipment shall not be considered current.

1.03 REFERENCED STANDARDS

A. American Water Works Association (AWWA) latest edition:

1. AWWA C651 – Disinfecting Water Mains
2. AWWA C901 – Polyethylene Pressure Pipe and Tubing, ½ Inch Through 3 Inch for Water Service
3. AWWA C906 – Polyethylene Pressure Pipe and Fittings, 4 Inch Through 63 Inch for Water Distribution and Transmission

C. American Society of Civil Engineers (ASCE) – Manual of Practice 108 for Pipeline Design for Installation by Directional Drilling

B. American Society for Testing and Materials (ASTM) latest edition:

1. ASTM D638 – Tensile Method for Tensile Properties of Plastics
2. ASTM D790 – Test Materials for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
3. ASTM D2122 – Standard Method of Determining Dimensions of Thermoplastics Pipe and Fittings
4. ASTM D2239 – Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter
5. ASTM D2657 – Practice for Heat-Joining of Polyolefin Pipe and Fittings
6. ASTM D2683 – Standard Specification for Socket Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing
7. ASTM D2774 – Standard Practice for Underground Installation of Thermoplastic Pressure Piping
8. ASTM D2837 – Standard Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products
9. ASTM D3035 – Polyethylene (PE) Plastic Pipe (DR-PE) Based on Controlled Outside Diameter
10. ASTM D3261 – Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
11. ASTM D3350 – Polyethylene Plastic Pipe and Fittings Material
12. ASTM F412 – Standard Terminology Relating to Plastic Piping Systems
13. ASTM F714 – Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
14. ASTM F905 – Standard Practice for Qualification of Polyethylene Saddle-Fused Joints
15. ASTM F1055 – Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing

16. ASTM F1056 – Standard Specification for Socket Fusion Tools for Use in Socket Fusion Joining Polyethylene Pipe or Tubing and Fittings
17. ASTM F1290 – Standard Practice for Electrofusion Joining Polyolefin Pipe and Fittings
18. ASTM F1962-11 – Standard Guide for Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit Under Obstacles, Including River Crossings
19. ASTM F2164 – Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure
20. ASTM F2206 – Fabricated Fittings for Butt-Fused Polyethylene Plastic Pipe
21. ASTM F2620 – Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings
22. ASTM F2786 – Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Gaseous Testing Media Under Pressure (Pneumatic Leak Testing)
23. ASTM F3124 – Standard Practice for Data Recording the Procedure used to Produce Heat Butt Fusion Joints
24. ASTM F3190 – Standard Practice for Heat Fusion Equipment (HFE) Operator Qualifications on Polyethylene (PE) and Polyamide (PA) Pipe and Fittings

D. North American Society for Trenchless Technology (NASTT) latest edition:

1. NASTT's Horizontal Direction Drilling (HDD) Good Practices Guidelines – 4th Edition

E. Plastics Pipe Institute (PPI) latest edition:

1. The Plastics Pipe Institute Handbook of Polyethylene Pipe – Chapter 12 Horizontal Directional Drilling
2. PPI – TN-36 – General Guidelines for Connecting HDPE Potable Water Pressure Pipes to DI and PVC Piping Systems
3. PPI – TN-38 – Bolt Torque for Polyethylene Flanged Joints
4. PPI – TN-44 – Long Term Resistance of AWWA C906 Polyethylene (PE) Pipe to Potable Water Disinfectants
5. PPI – TN-45 – Mechanical Couplings for Joining Polyethylene Pipe
6. PPI – TN-46 – Guidance for Field Hydrostatic Testing of High Density Polyethylene Pressure Pipelines: Owner's Considerations, Planning, Procedures, and Checklists
7. PPI – TN-49 – Recommendations for AWWA C901 Service Tubes in Potable Water Applications
8. PPI – TN-54 – General Guidelines for Squeezing Off Polyethylene Pipe in Water, Oil and Gas Applications
9. PPI – TR-46 – Guidelines for Use of Mini-Horizontal Directional Drilling for Placement of High Density Polyethylene Pipe

F. Plastics Pipe Institute Municipal Advisory Board (MAB)
   1. MAB Generic Electrofusion Procedure for Field Joining of 12 Inch and Smaller Polyethylene (PE) Pipe
   2. MAB Generic Electrofusion Procedure for Field Joining of 14 Inch to 30 Inch Polyethylene (PE) Pipe
   3. MAB Model Specifications for PE 4710 Buried Potable Water Service, Distribution and Transmission Pipes and Fittings

1.04 SUBMITTALS

A. Contractor shall submit personnel information detailing the names and resumes, including specific project experience, for the proposed project manager, superintendent, guidance operator and drill operator proving that the experience meets the requirements detailed in this specification.

B. Contractor shall submit personnel information, including specific project experience, for all proposed drilling, drill guidance, and pipe joining equipment operators, including evidence of training in the use of the proposed equipment by an authorized representative of the equipment manufacturer or their qualified agent.

C. Provide technical data for the equipment to be used on the project, including make, model and technical specifications for each of the following:

   1. Horizontal directional drill rig
   2. Drilling system components
   3. Downhole drilling assembly and reaming equipment
   4. Downhole pressure sub
   5. Guidance and control system
   6. Pulling head
   7. Swivels
   8. Rollers
   9. Solids separation and drill fluid recirculation systems
   10. Pipe fusion equipment
   11. Pipe fusion data logger
   12. Pipe handling equipment
   13. Pigs and pigging equipment
   14. Calibration certification for the pilot bore guidance and control system
   15. Calibration certification for the heat fusion datalogger

D. Submit pipe catalog information confirming that pipe, fittings, joints, and other materials conform to the requirements of the specifications.

E. Submit pipe manufacturer's most current calculations regarding tensile load limitations for trenchless installations.

F. Provide information showing staging and pipe fusion areas, site access during work activities, pipe storage and handling and procedure for pipe joining.

G. Submit a proposed bore path layout in both plan and profile. The proposed bore path shall conform to the drilling equipment and pipe material constraints.

H. Provide a work plan detailing the procedure and schedule to be used to execute the project. Horizontal directional drilling shall not commence until the contractor has received written approval of all work plan submittals. The Contractor shall provide complete descriptions of proposed plans, procedures and personnel, as well as supporting calculations for the following:

1. Drilling operations, addressing procedures for pilot hole drilling and reaming, tracking and controlling the drilling head locations and the preparation of as-built documentation
2. Drilling fluid management
3. Spoils handling and disposal
4. Pipe pullback and pullback monitoring.
5. Prevention of inadvertent fluid losses and spills, including contingencies for rapid containment and cleanup, including procedures for monitoring and controlling drilling fluid flows and pressures, equipment, resources and procedures for identifying, containing and cleaning up fluid losses and spills
6. Quality control and testing procedures
7. Safety plan

I. Provide a supplemental work plan in advance of performing the horizontal directional drill work. Horizontal directional drilling shall not commence until the contractor has received written approval of all supplemental work plan submittals. The work plan shall specifically address the following potential problems:

1. Obstructions along bore path during reaming or pull back
2. Drill pipe or product pipe cannot be advanced
3. Deviations from design line and grade exceed allowable tolerances
4. Drill pipe or product pipe broken off in borehole
5. Collapse of product pipe or excessive deformation
6. Damage to existing utilities
7. Excessive subsidence or heave

J. Design Requirements

1. Horizontal alignment shall be as shown on the project documents. The maximum depth shall be determined based on a minimum clearance from existing or proposed utilities to be crossed or the minimum clearances shown on the Drawings, whichever is greater. Bending radius shall not be less than the manufacturer's recommended minimum bending radius of the pipe. Compound curvatures may be used, but shall not exceed the

maximum deflections as set forth by the manufacturer or AWWA standards, whichever is more strict.

2. In accordance with ASTM F1962-11, Bore Entry (Pipe exit) angle shall be between 8 and 20 degrees and Bore Exit (Pipe Entry) angle shall be relatively shallow, preferably less than 10 degrees. Any deviation from these angles should be submitted to the Owner for approval.

K. Provide detailed design calculations in accordance with ASTM F1962. The calculations shall support the Contractor's specific proposed means, methods and products. The Contractor's final design calculations shall be prepared and sealed by a Licensed Professional Engineer registered in the State as to which the Project is located. Horizontal directional drilling shall not commence until the contractor has received written approval of all design calculation submittals. Design calculations shall demonstrate that the proposed pipe, equipment and means and methods comply with the requirements of this specification and have been designed based on the design borepath, installation means and methods, for anticipated installation and handling, hydrostatic, earth and live loads, installation temperature and site conditions. Contactor shall provide the following calculations:

1. Maximum allowable pipe loading limits
2. Design radius of the proposed bore path, including minimum radii for all curves
3. Pullback load calculation based on proposed drill path plan and profile including pipe stress calculations
4. Confirmation that the design parameters do not result in installation stress that exceeds allowable pipe stresses
5. Bouyancy effect calculations (if applicable)
6. Effects of ballasting plan on pipe pullback forces (if applicable)
7. Hydrofracture analysis

L. Contractor shall provide a plan to locate and protect all adjacent utilities and infrastructure.

M. Submit traffic control plan for all entrance and exit pits.

N. Submit bore logs that clearly indicate the pipe diameter, location (by station), and depth below grade of the installed pipeline, recorded every 10 feet maximum along the pipeline. Submit within 7 days of the completion of each bore.

O. Provide as-built documentation. Contractor shall plot as-built conditions on the field drawings, including the location in plan and elevation of the drill string, reaming head, and installed pipe, at the completion of each production shift. Include on the drawings pipeline horizontal and vertical data recorded every 10 feet along the pipeline or once per joint of drill pipe.

P. Contractor to maintain all testing and quality control documentation and assurance procedures. Contractor to provide the following documents to the Owner:

1. Quality control test reports
2. Fusion reports for each weld as reported by the datalogger

1.05 UTILITY LOCATING

A. The Contractor shall be responsible for following the procedures in this specification to identify, locate and verify the presence of existing utilities along the route of the proposed pipeline or work areas.

B. Utility locating will be performed in three parts: identification, designating and verification.

1. Utility Identification – Identify the presence of underground utilities through Florida One Call service and visual observation of surface markers or other indicators such as manholes, valve boxes, fire hydrants, etc.
2. Utility Designation – Marking the location of underground utilities with paint or flags based on utility owner information or third party locating equipment.
3. Utility Verification – Verification of Utility Identification and Designation by excavation or other methods to determine the horizontal and vertical location of the underground utility. This also provides the size and material of the underground utility. Approved methods to accomplish this task include vaccum excavation, potholing, and test holes with traditional equipment (backhoes, etc.)

C. The Contractor shall record the location (horizontal and vertical) of all known utilities, as defined within this specification, on the project documents. At a minimum, utilities shall be located by station and offset from the project baseline or with state plan coordinates. Vertical location can be based on depth from existing grade or elevation using the project vertical datum.

D. The project documents showing all known existing utilities shall be submitted to the Owner's Representative for review and to document, prior to construction, the known utilities within the project limits. The Owner's Representative will have a five (5) working day period to review and approve or comment on the utility locations.

E. The approved project documents showing the existing utilities shall be the basis for changes to the contract as addressed within these specifications.

F. Utilities located and documented as described above then subsequently damaged by the Contractor under this contract will have no basis for claims against the Owner for costs associated with repairs, delays, etc.

G. Damage to existing underground utilities that were not identified by the procedures noted above will be the utility owner's responsibility to repair or replace.

PART 2 PRODUCTS

2.01 POLYETHYLENE PIPE, FITTINGS AND ACCESSORIES

A. Polyethylene pipe and fittings 4-30 inch diameter shall be in accordance with AWWA C906, material designation code of PE4710 and all applicable ASTM standards.

B. Polyethylene pipe ½ -3 inch diameter for main line piping shall be polyethylene pipe (not tubing) in accordance with AWWA C901, material designation code of PE4710 and all applicable ASTM standards.

C. Butt fusion fittings shall be made of HDPE material with a minimum material designation code of PE4710 and all applicable ASTM standards. Molded and fabricated fittings shall have a pressure rating equal to the pipe unless otherwise specified on the project documents. All fittings shall meet the requirements of AWWA C901, C906 and all applicable ASTM standards. Markings for molded fittings shall comply with the requirements of ASTM D3261. Fabricated fitting shall be marked in accordance with ASTM F2206. Socket fittings shall meet ASTM D2683. Fabricated fittings shall be manufactured using a McElroy DataLogger to record fusion time, pressure and temperature, and shall be marked with a unique joint identifier that corresponds to the joint report. A graphic representation of the time and pressure data for all fusion joints made producing fittings shall be maintained for a minimum of five years as part of quality control and will be available upon request of owner.

D. Electrofusion fittings shall be made of HDPE material with a minimum material designation code of PE4710 and meet ASTM F1055. Electrofusion fittings shall have a pressure rating equal to the pipe unless otherwise specified on the project documents. All electrofusion fittings shall be suitable for use as pressure conduits and have nominal burst values of four times the working pressure rating of the fitting. Marking of electrofusion fittings shall comply with the requirements of ASTM F1055. All electrofusion fittings shall be properly stored in compliance with the manufacturers recommendation.

E. Saddle fusion could be used to fuse branch saddles, tapping tees and other HDPE fittings onto the wall of the main pipe. Saddle fusion shall be done in accordance with ASTM F2620 or PPI TR-41 or the fitting manufacturer's recommendations. Saddle fusion joints shall be made by qualified fusion technicians. Qualification of the fusion technician shall be demonstrated by evidence of fusion training within the past two years on the equipment to be utilized on this project in accordance with ASTM F3190.

F. Socket fusion could be used to fuse branch saddles, tapping tees and other HDPE fittings onto the wall of the main pipe. Socket fusion shall be done in accordance with ASTM D2683 or the fitting manufacturer's recommendations. Socket fusion joints shall be made by qualified fusion technicians. Qualification of the fusion technician shall be demonstrated by evidence of fusion training within the past two years on the equipment to be utilized on this project in accordance with ASTM F3190. All equipment used for socket fusion should comply with ASTM F1056 and manufacturer's recommendations.

G. Flanges and Mechanical Joint Adapters (MJ) shall have a minimum material designation code of PE4710 and meet all applicable AWWA and ASTM standards. Flanged and MJ adapters can be made to ASTM D3261 or machined in compliance with ASTM F2206. Flanges and MJ adapters shall have a pressure rating equal to the pipe unless otherwise specified on the project documents. Markings for molded or machined flange adapters or MJ adapters shall be per ASTM D3261. Fabricated (including machined) flange adapters shall be marked per ASTM F2206. Installation of all Flanged adapters shall follow the guidelines of the Plastics Pipe Institute TN-38.

H. Glands, bolts, and gaskets shall be manufactured in accordance with AWWA C153. Bolts and nuts shall be grade 2 or higher.

2.02 PIPELINE IDENTIFICATION

A. All polyethylene pipe shall be marked in accordance with the standards to which it is manufactured.

B. All polyethylene pipe shall be black, and shall contain a continuous colored stripe, 2 inches wide, located at no greater than 90 degree intervals around the pipe. Stripes shall be impregnated or molded into the pipe by the manufacturer. Application of the stripes after manufacture is not acceptable. Stripe color shall be:

1. Potable Water Mains - blue stripes
2. Reclaimed Water Mains - purple stripes
3. Force Mains - brown stripes
4. Sanitary Sewer - green stripes
5. Storm Sewer - no stripes required

2.03 TRACER WIRE

A. Installation of Tracer Wire. The Contractor shall be required to install tracer wire during the horizontal directional drilling operations including along all pits for connections. The tracer wire shall be installed simultaneously with the PE piping system. Tracer wire shall be properly spliced at each end connection and each service connection. Care should be taken to adequately wrap and protect wire at

all splice locations. No bare tracer wire shall be accepted. Provide Magnesium alloy anode for cathodic protection that conforms to the requirements of ASTM B843. Install tracer wire per local and manufacturer's requirements. A minimum of three separate tracer wires shall be installed with the Directional Bore. Contractor shall be required to provide as many wires as necessary to maintain continuity throughout the length of the directional bore. Failure of continuous continuity in the locating wire shall result in abandonment and reinstallation of the directional drill, at the discretion of the Owner.

1. Tracer wire shall be three (3) 3/16-inch, 7 x 7 (or stronger) Stranded Copper Clad Steel Extreme Strength with 4,700 lb. break load, or braided stainless steel (A304 or A316), with minimum 50 mil HDPE insulation thickness.

2.04 DRILLING FLUIDS

A. All drilling fluids should be a bentonite slurry mixture with any applicable amendments as determined by the drill operators.

2.05 DELIVERY, STORAGE AND HANDLING OF MATERIALS

A. Contractor is required to inspect materials delivered to the site for damage. All materials found during inspection or during the progress of work to have cracks, flaws, or other defects shall be rejected and removed from the job site without delay.

B. Contractor is responsible for obtaining, transporting and sorting any fluids, including water, to the work site.

C. Contractor is responsible for disposal of fluids on the project site. The disposal of fluids shall be done in compliance with all permits and applicable federal, state or local environmental regulations. The bentonite drilling slurry may be recycled for reuse in the hole opening operation, or shall be hauled by the Contractor to an approved location or landfill for proper disposal. Contractor shall thoroughly clean the project area or any fluid residue upon completion of installation and replace any and all plants and sod damaged, discolored or stained by drilling fluids.

PART 3 EQUIPMENT

3.01 GENERAL

A. The directional drilling equipment shall consist of a directional drilling rig of sufficient capacity to perform the bore and pullback the pipe, a drilling fluid mixing, delivery and recovery system of sufficient capacity to successfully complete the drill, a drilling fluid recycling system to remove solids from the drilling fluid so that the fluid can be re-used, a guidance system to accurately guide boring operations, a vacuum truck of sufficient capacity to handle the drilling fluid volume

and trained and competent personnel to operate the system. All equipment shall be in good, safe operating condition with sufficient supplies, materials and spare parts on hand to maintain the system in good working order for the duration of the project.

3.02 DRILLING SYSTEM

A. Drilling Rig – the directional drilling machine shall consist of a power system to rotate, push and pull hollow drill pipe into the ground at a variable angle while delivering a pressurized fluid mixture to a guidable drill (bore) head. The power system shall be self contained with sufficient pressure and volume to power drilling operations. Hydraulic system shall be free of leaks. Rig shall have a system to monitor and record maximum pull-back pressure during pull-back operations. The rig shall be grounded during drilling and pull-back operations. There shall be a system to detect electrical current from the drilling string and an audible alarm which automatically sounds when an electrical current is detected.

B. Drill Head – the drill head shall be steerable by changing its rotation and shall provide the necessary cutting surfaces and drilling fluid jets.

3.03 GUIDANCE SYSTEM

The guidance system used shall provide real time electronic data to the inspector on request. All daily data and project data shall be displayed on the As-built documentation. The guidance system shall be capable of tracking a depth of 40 feet or 20 feet below design bore path, whichever is greater, and in any soil condition, including hard rock. It shall enable the driller to guide the drill head by providing immediate information on the tool face, azimuth (horizontal direction,) and inclination (vertical direction.) The guidance system shall be accurate to +/- 2% of the vertical depth of the borehole at sensing position at depths up to one hundred feet and accurate within 2 feet horizontally.

The Guidance System shall be of a proven type and shall be operated by personnel trained and experienced with this system. The equipment operator shall be aware of any magnetic anomalies on the surface of the drill path and shall consider such influences in the operation of the guidance system if using a magnetic system.

A. Bore Tracking and Monitoring – at all times during the pilot bore, the Contractor shall provide and maintain a bore tracking system that is capable of accurately locating the position of the drill head in the x, y, and z axes. The Contractor shall record these data at least once per drill pipe length or every twenty-five (25) feet, whichever is more frequent.

B. Downhole and Surface Grid Tracking System – the Contractor shall monitor and record x, y, and z coordinates relative to an established surface survey bench mark.

The data shall be continuously monitored and recorded at least once per drill pipe length or at twenty-five (25) feet, whichever is more frequent.

C. Deviations between the recorded and design bore path shall be calculated and reported on the daily log. If the deviations exceed the allowable tolerances from the design path, such occurrences shall be reported to the Owner. The Contractor shall undertake all necessary measures to correct deviations and return to design line and grade.

D. Drilling Fluid Pressures and Flow Rates – Drilling fluid pressures and flow rates shall be continuously monitored and recorded by the Contractor. The pressures shall be monitored at the pump. These measurements shall be made during pilot bore drilling, reaming and pullback operations.

3.04 DRILLING FLUID (MUD) SYSTEM

A. Mixing System – a self contained, closed, drilling fluid mixing system shall be of sufficient size to mix and deliver drilling fluid. Mixing system shall continually agitate the drilling fluid during operations.

B. Drilling Fluids – drilling fluid shall be composed of clean water, appropriate additives and clay. Water for mixing the drilling fluid shall be potable water, procured by the Contractor. The water and additives shall be mixed thoroughly and be absent of any clumps or clods. Vary the fluid viscosity to best fit the soil conditions encountered. Do not use any other chemicals or polymer surfactants in the drilling fluid without written consent from the Engineer. Certify to the Engineer in writing that any chemicals to be added are environmentally safe and not harmful or corrosive to the facility.

C. Delivery System – the delivery system shall have filters in-line to prevent solids from being pumped into the drill pipe. Connections between the pump and drill pipe shall be relatively leak-free. Used drilling fluid and drilling fluid spilled during drilling operations shall be contained and conveyed to the drilling fluid recycling system. A berm, minimum of 12" high, shall be maintained around drill rigs, drilling fluid mixing system, entry and exit pits and drilling fluid cycling systems to prevent spills into the surrounding environment. Pumps and or vacuum truck(s) of sufficient size shall be in place to convey excess drilling fluid fromcontainment areas to storage and recycling facilities.

D. Drilling Fluid Viscosity – in the event that inadvertent returns or returns loss of drilling fluid occurs during pilot hole drilling operations, the Contractor shall cease drilling, wait at least 30 minutes, inject a quantity of drilling fluid with an appropriate viscosity and then wait another 30 minutes. If mud fracture or returns loss continues, the Contractor shall cease operations and notify the Owner.

E. Drilling Fluid Recycling System – the drilling fluid recycling system shall separate sand, dirt and other solids from the drilling fluid to render the drilling fluid re-usable. Spoils are separated from the drilling fluid will be stockpiled for later use or disposed.

F. Control of Drilling Fluids – the Contractor shall follow all requirements of the proposed work plan and supplemental work plan as submitted and approved and shall control operations pressures, drilling mud weights, drilling speeds and any other operational factors to avoid hydrofracture fluid losses to formations, and control drilling fluid spillage. This includes any spillages or returns at entry and exit pit locations or at any intermediate point. All inadvertent returns or spills shall be promptly contained and cleaned up. The Contractor shall maintain on-site mobile spoil removal equipment during all drilling, pre-reaming and pullback operations and shall be capable of quickly removing spoils. The Contractor shall immediately notify the Owner of any inadvertent returns or spills and immediately contain and clean up the return or spill.

3.05 OTHER EQUIPMENT

A. Pipe Rollers – pipe rollers, if used, shall be of sufficient size to fully support the weight of the pipe while being hydro-tested and during pull back operations. Sufficient number of rollers shall be used to prevent excess sagging of pipe.

3.06 DATA LOGGER

A. A data logger shall be used to record and document all butt fusion process. The data logger must be compatible and outfitted with an electronic data recording device. A digital report or printout for all fusion joints made that complies with, but is not limited to, ASTM F3124 must be delivered to the OWNER upon request and at the completion of the project. All hydraulic fusion must be recorded and able to produce a graphic representation of the time and pressure data. All manual fusion must be recorded with, but not limited to, Joint ID, Operator Name and ID, Pipe information, and Heater Plate Temperature. The recording unit shall be a DataLogger 6 as manufactured by McElroy Manufacturing, Inc, or newer model or approved equivalent.

PART 4 EXECUTION

4.01 GENERAL

A. Locate positions of entry and exit pits, establish elevation and horizontal datum for bore head control, and lay out pipe assembly area. Lay out and assemble pipe in a manner that does not obstruct adjacent roads, and commercial or residential activities adjacent to construction areas.

B. Proposed deviations from the bore path due to underground obstructions shall be approved by the Engineer prior to construction.

C. Horizontal and vertical tolerance of the installed bore path from approved bore path shall be within ± 6 inches in the vertical plane and within ± 2 feet in the horizontal plane.

D. The maximum allowable pull load determined during the design calculations for the installed Polyethylene pipe system should not be exceeded. If the maximum observed pull load exceeds the maximum allowable pull load, the Owner may request the drill be re-installed with new Polyethylene pipe at the Contractor's expense.

E. Final acceptance including final payment of directional bored pipelines will not be made until directional bore logs have been submitted and the information on the bore logs documents the depth of the installed pipeline is in accordance with these specifications.

4.02 DIRECTIONAL DRILLING

A. The installation of pipeline by directional drilling shall be within the limits indicated on the drawings, unless otherwise approved by the Owner or Engineer.

B. Install erosion control measures and dewater as required.

C. Steering of the bore must be performed with a method approved by the boring equipment manufacturer. Such methods include walkover, wire line, wire line with surface grid and other accepted methods. Use a locating and tracking system capable of ensuring that the proposed installation is installed as intended. The locating and tracking system must provide information on:

1. Clock and pitch information
2. Depth
3. Transmitter temperature
4. Battery status
5. Position (x,y)
6. Azimuth, where direct overhead readings (walkover) are not possible (i.e. subaqueous or limited access transportation facility)

D. Ensure proper calibration of all equipment before commencing drilling operation. Take and record alignment readings or plot points such that elevations on top of and offset dimensions from the center of the product to a permanent fixed feature are provided. Such permanent fixed feature must have prior approval of the Owner or Engineer. Provide elevations and dimensions at all bore alignment corrections (vertical and horizontal) with a minimum distance between points of 20 feet. Provide a sufficient number of elevations and offset distances to accurately plot the

vertical and horizontal alignment of the installed product. A minimum of three elevation and plot points are required.

E. The depth of the directional drilling shall be the minimum necessary to prevent surface heave, unless the drawings require the installation to be at deeper depths. Any proposed changes to the depth of the directional bore from what is shown on the drawings must be approved by the Engineer in writing, prior to commencement of drilling. Where utilities cross under department of transportation (DOT) roads, the depth of cover shall comply with any applicable DOT permits.

F. Borings shall be conducted using a mechanical boring head, assisted by and cooled by drilling fluid of low pressure and volume. Material Safety Data Sheets must be provided and approved by the Engineer for all drilling slurry compounds.

G. Back reaming shall be conducted to enlarge and prepare the bore hole for pipe installation. Minimize potential damage from soil displacement or settlement by limiting the ratio of the bore hole to the product size. The size of the back reamer bit or pilot bit, if no back reaming is required, shall be limited relative to the product diameter.

H. Ensure adequate removal of soil cuttings and stability of the bore hole by monitoring the drilling fluids such as the pumping rate, pressures, viscosity and density during the pilot bore, back reaming and pipe installation. Obtain the Engineer's approval of the location and all conditions necessary to construct relief holes to relieve excess pressure and ensure the proper disposition of drilling fluids is maintained.

I. Minimize heaving during pull back. The pull back rate used shall maximize the removal of soil cuttings without building excess down hole pressure. Contain excess drilling fluids at entry and exit points until they are recycled or removed from the site or vacuumed during drilling operations. Entry and exit pits are to be of sufficient size to contain the expected return of drilling fluids and soil cuttings.

J. Ensure that all drilling fluids are disposed of or recycled in a manner acceptable to the appropriate local, state, or federal regulatory agencies. If in the drilling process it becomes evident that the soil is contaminated, contact the Engineer immediately. Do not continue drilling without the Engineer's approval.

K. Install the carrier in the bore hole within the same day that the pre-bore is completed to ensure stability.

4.03 PIPE JOINING

A. High density polyethylene pipe shall be heat fused and pressure tested as per manufacturer's guidelines before installation in the bore hole. During assembly and

prior to pullback, pipe must be laid out in such a way as to minimize interference to pedestrian and vehicular traffic.

B. Cuts or gouges that reduce the wall thickness by more than 10% are not acceptable and must be cut out, discarded and the pipe rejoined.

C. Each butt fusion shall be recorded and logged by a datalogger affixed to the fusion machine. Joint data shall be submitted as part of the As-built documentation.

D. Mechanical joining – Polyethylene pipe and fittings may be joined together or to other materials by means of flanged connections or mechanical couplings designed for joining polyethylene pipe or for joining polyethylene pipe to another pipe material. Mechanical couplings shall be fully pressure rated and fully thrust restrained and installed in accordance with manufacturer's recommendations.

E. Install required locator wire along polyethylene pipe prior to pulling through bore hole as per these specifications.

F. After pulling pipe, clean exposed ends for installation of fittings, test locator wire for continuity.

4.04 BORING FAILURE

A. If an obstruction is encountered during boring which prevents completion of the installation in accordance with the drawings and specifications, either remove the pipe or abandon the pipe in place at the discretion of the Engineer.

B. If the pipe cannot be withdrawn and Engineer approves abandoning the pipe in place, cut pipe off at least 3 feet below ground surface, fill annular space and pipe with excavatable flowable fill and cap ends of pipe with blind flange.

C. In the event of failure to install pipe, retain possession of pipe and remove it from the site.

D. Upon approval of the Engineer, fill the abandoned bore hole with excavatable flowable fill.

E. Submit a new installation procedure and revised plans to the Engineer for approval before resuming work at another location.

F. If, during construction, damage is observed to the facility, cease all work until resolution to minimize further damage and a plan of action for restoration is obtained and approved by the Engineer.

G. If the submitted boring logs indicate the installed alignment does not meet vertical or horizontal alignment requirements, the boring is considered a failure, and the

directional bored pipeline shall be either re-bored or otherwise remedied at the discretion of the Owner.

4.05 SWABBING

A. The purpose of swabbing a new pipeline is to conserve water while thoroughly cleaning the pipeline of all foreign material, sand, gravel, construction debris and other items not found in a properly cleaned system. Prior to pressure testing of a new pipeline swabbing shall be utilized as specified on the project documents for each project.

B. New water, sewer force and reclaimed mains greater than 12" ID (unless determined otherwise by the Owner) shall be hydraulically cleaned with a polypropylene swabbing device to remove dirt, sand and debris from main.

C. If swabbing access and egress points are not provided in the design drawings, it will be the responsibility of the Contractor to provide temporary access and egress points for the cleaning, as required.

D. Cleaning of the system shall be done in conjunction with, and prior to, the initial filling of the system for its hydrostatic test.

E. The line to be cleaned shall only be connected to the existing distribution system at a single connection point.

F. At the receiver or exit point for the poly swab, the Contractor is responsible for creating a safe environment for collection of debris, water and the swab. Considerations shall be made for protecting surrounding personnel and property and safe retrieval of the swab.

4.06 TESTING

A. Disinfection tests

1. All water pipe and fittings shall be thoroughly disinfected prior to being placed in service. Disinfection shall follow the applicable provisions of the procedure established for the disinfection of water mains as set forth in AWWA C651. Bacteriological testing on the water main shall be scheduled, completed and sent for water analysis (lab testing.) The results of the lab testing shall be sent to the Owner. No pipeline shall be placed into service until it is properly disinfected and water analysis proves it is disinfected.

2. Temporary blow-offs shall be installed for the purpose of cleaning the water main. Temporary blow-offs shall be removed and plugged after the main is cleared. The main shall be flushed prior to disinfection.

3. The new water main shall be connected to the existing water main at one point only for flushing purposes. The new main MUST have a blow off on the end as required. After the new main is thoroughly flushed, the open end shall be sealed and restrained and the main shall be thoroughly disinfected.

B. Pressure and Leakage tests

1. Conduct hydrostatic pressure testing of installed polyethylene pipe in accordance with ASTM F2164.

2. For HDPE mains, fill the main slowly ensuring fill rate does not exceed capacity of air release devices. Once air has been expelled from the system, gradually raise the pressure to 160 psi. Add makeup water as necessary to maintain this pressure as necessary for 4 hours. After the 4 hour period, reduce main pressure to the 150 psi test pressure and monitor for 1 hour. Do not increase pressure or add makeup water during this one hour period. The test is passed and considered acceptable if the main pressure does not drop more than 5% (7.5 psi) during the one hour period.

3. If any defects or leaks are revealed, they should be corrected and the pipeline retested after a minimum 24 hour recuperation period between tests. Total testing conducted on a section of pipeline shall not exceed 8 hours within a 24 hour period.

4.07 DISPOSAL OF SURPLUS FLUIDS

A. All drill fluid excess shall be contained in entry and/or exit pits and pumped as needed into additional on-site storage tanks, tanker trucks, vacuum trucks, etc. Dispose of excess drill fluid offsite as allowed by local rules and regulations.

B. Dispose of all material not needed or not suitable for backfilling over or around the entry and receiving pits. The disposal shall be subject to local codes and regulations.

4.08 RESTORATION

After extraction, drill fluids, pits, work areas, staging and storage areas are to be restored to equal or better condition than pre-construction condition.

END OF SECTION

SECTION 02515

HIGH DENSITY POLYETHYLENE PIPE AND FITTINGS

PART 1 GENERAL

1.01 SCOPE OF WORK

The Contractor shall provide solid wall high density polyethylene pipe (HDPE) and fittings which conform to AWWA, ASTM and other referenced documents listed in this specification with flanged and thermal butt fusion joints complete in place.

1.02 MANUFACTURER QUALIFICATIONS

A. Manufacturer shall have a minimum of 5 years recent experience producing HDPE pressure pipe and fittings for at least the specified sizes and lengths, and shall be able to submit documentation of at least 5 installations in satisfactory operation for at least 5 years.

B. HDPE pipe and fittings manufacturers and distributors shall be listed as current members of the Alliance for PE Pipe.

C. Contractor shall have a minimum of 5 years recent experience installing HDPE pressure pipe and fittings for at least the specified pipe and fittings sizes and lengths and shall be able to submit documentation of at least 5 installations in satisfactory operation for at least 5 years.

D. All pipe and fittings of each material type shall be furnished by the same manufacturer.

E. The HDPE utility pipe and fittings manufacturer shall review and approve or prepare all Shop Drawings and other submittals for all components furnished under this Section.

F. Pipe and fittings, including linings and coatings, that will convey potable water or water that will be treated to become potable, shall be certified by an accredited organization in accordance with NSF 61 as being suitable for contact with potable water, and shall comply with requirements of authorities having jurisdiction at Site.

1.03 REFERENCED STANDARDS

A. American Water Works Association (AWWA) latest edition:

1. AWWA C901 - Polyethylene Pressure Pipe and Tubing, ½ Inch Through 3 Inch for Water Service

2. AWWA C906 - Polyethylene Pressure Pipe and Fittings, 4 Inch Through 65 Inch for Water Distribution and Transmission

B. American Society for Testing and Materials (ASTM) latest edition:

1. ASTM D638 – Tensile Method for Tensile Properties of Plastics
2. ASTM D790 – Test Materials for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
3. ASTM D2122 – Standard Method of Determining Dimensions of Thermoplastics Pipe and Fittings
4. ASTM D2239 – Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter
5. ASTM D2657 – Practice for Heat-Joining of Polyolefin Pipe and Fittings
6. ASTM D2683 – Standard Specification for Socket Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing
7. ASTM D2774 – Standard Practice for Underground Installation of Thermoplastic Pressure Piping
8. ASTM D2837 – Standard Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products
9. ASTM D3035 – Polyethylene (PE) Plastic Pipe (DR-PE) Based on Controlled Outside Diameter
10. ASTM D3261 – Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
11. ASTM D3350 – Polyethylene Plastic Pipe and Fittings Material
12. ASTM F412 – Standard Terminology Relating to Plastic Piping Systems
13. ASTM F714 – Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
14. ASTM F905 – Standard Practice for Qualification of Polyethylene Saddle-Fused Joints
15. ASTM F1055 – Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing
16. ASTM F1056 – Standard Specification for Socket Fusion Tools for Use in Socket Fusion Joining Polyethylene Pipe or Tubing and Fittings
17. ASTM F1290 – Standard Practice for Electrofusion Joining Polyolefin Pipe and Fittings
18. ASTM F2164 – Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure
19. ASTM F2206 – Fabricated Fittings for Butt-Fused Polyethylene Plastic Pipe
20. ASTM F2620 – Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings
21. ASTM F2786 – Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Gaseous Testing Media Under Pressure (Pneumatic Leak Testing)
22. ASTM F3124 – Standard Practice for Data Recording the Procedure used to Produce Heat Butt Fusion Joints

23. ASTM F3190 – Standard Practice for Heat Fusion Equipment (HFE) Operator Qualifications on Polyethylene (PE) and Polyamide (PA) Pipe and Fittings

C. Plastics Pipe Institute (PPI) latest edition:
1. The Plastics Pipe Institute Handbook of Polyethylene Pipe
2. PPI – TN-36 – General Guidelines for Connecting HDPE Potable Water Pressure Pipes to DI and PVC Piping Systems
3. PPI – TN-38 – Bolt Torque for Polyethylene Flanged Joints
4. PPI – TN-44 – Long Term Resistance of AWWA C906 Polyethylene (PE) Pipe to Potable Water Disinfectants
5. PPI – TN-45 – Mechanical Couplings for Joining Polyethylene Pipe
6. PPI – TN-46 – Guidance for Field Hydrostatic Testing of High Density Polyethylene Pressure Pipelines: Owner's Considerations, Planning, Procedures, and Checklists
7. PPI – TN-49 – Recommendations for AWWA C901 Service Tubes in Potable Water Applications
8. PPI – TN-54 – General Guidelines for Squeezing Off Polyethylene Pipe in Water, Oil and Gas Applications

D. Plastics Pipe Institute Municipal Advisory Board (MAB)
1. MAB Generic Electrofusion Procedure for Field Joining of 12 Inch and Smaller Polyethylene Pipe
2. MAB Generic Electrofusion Procedure for Field Joining of 14 Inch to 30 Inch Polyethylene Pipe
3. MAB Model Specifications for PE 4710 Buried Potable Water Service, Distribution and Transmission Pipes and Fittings

1.04 SYSTEM DESIGN PARAMETERS

A. The HDPE system working pressure rating accommodates the normal operating pressure and the repetitive surges. The pressure rating applies at 80° F or less. Piping installed that may experience operating temperatures up to 95° F shall be de-rated in accordance with manufacturer's recommendation.

B. Per AWWA 901 and C906, the repetitive surge pressure allowance is one half the pressure class of the pipe, and the occasional surge over pressure allowance is equal to the pressure class of the pipe. Allowable Total Pressure during Recurring Surge conditions equals 1.5 times the pipe's pressure class. Allowable Total Pressure during Occasional Surge conditions equals 2.0 times the pipe's pressure class.

Table 1 gives the Pressure Class per AWWA C906, Pressure Rating and Allowable Total Pressure during Recurring and Occasional Surge for PE4710 pipe at 80°F or less.

Table 1				
Pressure Class per AWWA C906 for PE 4710 at 80° F or Less				
Pipe Dimension Ratio (DR)	**Pressure Class (psi)**	**Pressure Rating (psi)**	**Allowable Total Pressure During Recurring Surge (psi)**	**Allowable Total Pressure During Occasional Surge (psi)**
DR 9	250	250	375	500
DR 11	200	200	300	400
DR 13.5	160	160	240	320
DR 17	125	125	187.5	250
DR 21	100	100	150	200
DR 26	80	80	120	160

1.05 SUBMITTALS

A. Contractor shall submit information detailing the manufacturer's experience requirements to satisfy the requirements of this specification.

B. Submit pipe catalog information confirming that pipe, fittings, joints, and other materials conform to the requirements of the specifications.

C. Affirmation that product shipped meets or exceeds the standards set forth in this specification. This shall be in the form of a written document from the manufacturer attesting to the manufacturing process meeting the standards.

D. Submit manufacturers recommended fusion procedures for the products.

PART 2 PRODUCTS

2.01 POLYETHYLENE PIPE, FITTINGS AND ACCESSORIES

A. Polyethylene pipe and fittings 4 - 30 inch diameter shall be in accordance with AWWA C906, material designation code of PE4710 and all applicable ASTM standards.

B. Polyethylene pipe ½ - 3 inch diameter for main line piping shall be polyethylene pipe (not tubing) in accordance with AWWA C901, material designation code of PE4710 and all applicable ASTM standards.

C. Butt fusion fittings shall be made of HDPE material with a minimum material designation code of PE4710 and all applicable ASTM standards. Molded and fabricated fittings shall have a pressure rating equal to the pipe unless otherwise specified on the project documents. All fittings shall meet the requirements of AWWA C901, C906 and all applicable ASTM standards. Markings for molded

fittings shall comply with the requirements of ASTM D3261. Fabricated fittings shall be marked in accordance with ASTM F2206. Socket fittings shall meet ASTM D2683. Fabricated fittings shall be manufactured using a McElroy DataLogger to record fusion time, pressure and temperature, and shall be marked with a unique joint identifier that corresponds to the joint report. A graphic representation of the time and pressure data for all fusion joints made producing fittings shall be maintained for a minimum of five years as part of quality control and will be available upon request of owner.

D. Electrofusion fittings shall be made of HDPE material with a minimum material designation code of PE4710 and meet ASTM F1055. Electrofusion fittings shall have a pressure rating equal to the pipe unless otherwise specified on the project documents. All electrofusion fittings shall be suitable for use as pressure conduits and have nominal burst values of four times the working pressure rating of the fitting. Marking of electrofusion fittings shall comply with the requirements of ASTM F1055. All electrofusion fittings shall be properly stored in compliance with the manufacturer's recommendation.

E. If saddle fusion is used to fuse branch saddles, tapping tees and other HDPE fittings onto the wall of the main pipe, it shall be done in accordance with ASTM F2620 or PPI TR-41 or the fitting manufacturer's recommendations. Saddle fusion joints shall be made by qualified fusion technicians. Qualification of the fusion technician shall be demonstrated by evidence of fusion training within the past two years on the equipment to be utilized on this project in accordance with ASTM F3190.

F. If socket fusion is used to fuse branch saddles, tapping tees and other HDPE fittings onto the wall of the main pipe, it shall be done in accordance with ASTM D2683 or the fitting manufacturer's recommendations. Socket fusion joints shall be made by qualified fusion technicians. Qualification of the fusion technician shall be demonstrated by evidence of fusion training within the past two years on the equipment to be utilized on this project in accordance with ASTM F3190. All equipment used for socket fusion should comply with ASTM F1056 and manufacturer's recommendations.

G. Flanges and Mechanical Joint Adapters (MJ) shall have a minimum material designation code of PE4710 and meet all applicable AWWA and ASTM standards. Flanged and MJ adapters can be made to ASTM D3261 or machined in compliance with ASTM F2206. Flanges and MJ adapters shall have a pressure rating equal to the pipe unless otherwise specified on the plans. Markings for molded or machined flange adapters or MJ adapters shall be per ASTM D3261. Fabricated (including machined) flange adapters shall be marked per ASTM F2206. Installation of all Flanged adapters shall follow the guidelines of the Plastics Pipe Institute TN-38.

H. Glands, bolts, and gaskets shall be manufactured in accordance with AWWA C153. Bolts and nuts shall be grade 2 or higher.

2.02 PIPELINE IDENTIFICATION

A. All polyethylene pipe shall be marked in accordance with the standards to which it is manufactured.

B. All polyethylene pipe shall be black, and shall contain a continuous colored stripe, 2 inches wide, located at no greater than 90 degree intervals around the pipe. Stripes shall be impregnated or molded into the pipe by the manufacturer. Application of the stripes after manufacture is not acceptable. Stripe color shall be:

1. Potable Water Mains - blue stripes
2. Reclaimed Water Mains - purple stripes
3. Force Mains - brown stripes
4. Sanitary Sewer - green stripes
5. Storm Sewer - no stripes required

PART 3 EQUIPMENT

3.01 DATA LOGGER

A. A data logger shall be used to record and document all butt fusion process. The data logger must be compatible and outfitted with an electronic data recording device. A digital report or printout for all fusion joints made that complies with, but is not limited to, ASTM F3124 must be delivered to the Owner upon request and at the completion of the project. All hydraulic fusion must be recorded and able to produce a graphic representation of the time and pressure data. All manual fusion must be recorded with, but not limited to, Joint ID, Operator Name and ID, Pipe information, and Heater Plate Temperature. The recording unit shall be a DataLogger 6 as manufactured by McElroy Manufacturing, Inc, or newer model or approved equivalent.

PART 4 EXECUTION

4.01 PIPE JOINING

A. High density polyethylene pipe shall be heat fused and pressure tested as per manufacturer's guidelines before installation. During assembly and prior to installation, pipe must be laid out in such a way as to minimize interference to pedestrian and vehicular traffic.

B. Cuts or gouges that reduce the wall thickness by more than 10% are not acceptable and must be cut out, discarded and the pipe rejoined.

C. Each butt fusion shall be recorded and logged by a datalogger affixed to the fusion machine. Joint data shall be submitted as part of the as-built documentation.

D. Mechanical joining – Polyethylene pipe and fittings may be joined together or to other materials by means of flanged connections or mechanical couplings designed for joining polyethylene pipe or for joining polyethylene pipe to another pipe material. Mechanical couplings shall be fully pressure rated and fully thrust restrained and installed in accordance with manufacturer's recommendations.

4.02 TESTING

A. Pressure and Leakage tests

1. Conduct hydrostatic pressure testing of installed polyethylene pipe in accordance with ASTM F2164.
2. For HDPE mains, fill the main slowly ensuring fill rate does not exceed capacity of air release devices. Once air has been expelled from the system, gradually raise the pressure to 160 psi. Add makeup water as necessary to maintain this pressure as necessary for four hours. After the four hour period, reduce main pressure to the 150 psi test pressure and monitor for one hour. Do not increase pressure or add makeup water during this one hour period. The test is passed and considered acceptable if the main pressure does not drop more than 5% (7.5 psi) during the one hour period.
3. If any defects or leaks are revealed, they should be corrected and the pipeline retested after a minimum 24 hour recuperation period between tests. Total testing conducted on a section of pipeline shall not exceed eight hours within a 24 hour period.

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 02530

SANITARY SEWERAGE SYSTEMS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, equipment, materials, and incidentals, and shall construct gravity sewers, complete, as shown on the Drawings and as herein specified.

B. The work shall include furnishing, laying, and testing gravity sewer pipe.

1.02 SUBMITTALS DURING CONSTRUCTION

A. Submittals during construction shall be made in compliance with Section 01340, Shop Drawings, Project Data, and Samples.

B. The Contractor shall submit within thirty (30) days after the date of the Notice to Proceed, a list of materials to be furnished, the names of suppliers and an expected schedule of delivery of materials to the site.

C. Furnish in duplicate to the Engineer sworn certificates that all tests and inspections required by the Specifications under which the pipe is manufactured have been satisfied.

D. The Pipe manufacturer shall inspect all pipe joints for out-of-roundness and pipe ends for squareness. The manufacturer shall furnish to the Engineer a notarized affidavit stating all pipe meets the requirements of ASTM ASCE, ANSI, etc., these Specifications, and the joint design with respect to square ends and out-of-round joint surfaces.

1.03 INSPECTION AND TESTS

A. All pipe and accessories to be installed under this Contract shall be inspected and tested at the place of manufacture by the manufacturer as required by the Standard Specifications to which the material is manufactured.

B. Each length of pipe shall be subject to inspection and approval at the factory, point of delivery, and site of work. Sample of pipe to be tested shall be selected at random by the Engineer or the testing laboratory and shall be delivered by the Contractor to the testing laboratory approved by the Engineer.

C. When the specimens tested conform to applicable standards, all pipe represented by such specimens shall be considered acceptable based on the test parameters measured. Copies of test reports shall be submitted to the Engineer be fore the pipe is installed in the project. Acceptable pipe will be stamped with an appropriate monogram under the supervision of the testing laboratory.

D. In the event that any of the test specimens fail to meet the applicable standards, all pipe

represented by such tests shall be subject to rejection. The Contractor may furnish two additional test specimens from the same shipment or delivery for each specimen that failed and the pipe will be considered acceptable if all of these additional specimens meet the requirements of the applicable standards.

E. Pipe which has been rejected by the Engineer shall be removed from the site of the work by the Contractor and replaced with pipe which meets these specifications.

F. Other testing requirements specific to the type of pipe are included under the appropriate paragraph in Part 2, below.

PART 2 - MATERIALS

2.01 GENERAL

A. Sizes and strength classification of gravity sewer pipe to be used in all locations are indicated on the Drawings.

B. Each length of pipe shall bear the name or trademark of the manufacturer, the location of the manufacturing plant, and the class or strength classification of the pipe. The markings shall be plainly visible on the pipe barrel.

C. Polyvinyl chlorinate pipe for sewer systems shall be green in color.

2.02 POLYVINYL CHLORIDE (PVC) GRAVITY SEWER PIPE

A. Smooth wall pipe and fittings in sizes 4" through 15" shall be manufactured in accordance with the requirements of ASTM D3034 SDR 35 and 18" and larger shall be manufactured in accordance with ASTM F679, T-l wall Type 1, SDR 35. P.V.C. pipe shall be manufactured from PVC compound having a minimum cell classification of 12454C as described in ASTM D1784. The pipe shall be joined with an integral bell, bell and spigot, type rubber gasket joint. Each integral bell joint shall be of the push-on type meeting the requirements of ASTM D3212 and shall consist of a formed bell complete with a single rubber gasket. The rubber gasket shall conform to the requirements of ASTM F477 and shall be held in place in the bell by mechanical means.

B. If pipe type is not indicated on the drawings, profile wall PVC pipe shall only be used with special permission from the Engineer. This specification includes materials, test methods and installation requirements for 4 to 36-inch diameter polyvinyl chloride (PVC) corrugated pipe with a smooth interior. The requirements of this specification are intended to provide pipe and fittings suitable for underground use in non-pressure applications for sanitary sewers.

PVC corrugated pipe with a smooth interior shall conform to the requirements of ASTM Designation F949-99 (or latest revision). Pipe and fittings shall be homogenous throughout and free from visible cracks, holes, foreign inclusions or other injurious defects. The pipe shall be made of PVC compound having a minimum cell classification of 12454B as defined in ASTM Specification D1784.

All fittings for PVC corrugated sewer pipe with a smooth interior shall conform to ASTM F9494-99 Section 5.23.3. To insure compatibility, the pipe manufacturer shall provide all fittings.

All joints shall be made with integrally-formed bell and spigot gasketed connections. The manufacturer shall provide documentation showing no leakage when gasketed pipe joints are tested in accordance with ASTM Test Method D3212. Elastomeric seals (gaskets) shall meet the requirements of ASTM Designation F477.

C. Main Gravity Sewer PVC Pipe for Jacking and Boring shall be Non-Metallic Restrained Joint PVC:

a) Pipe shall be manufactured from pressure pipe and couplings conforming to AWWA C900 (8-inch through 12-inch) and AWWA C905 (14-inch through 48-inch). The restrained pipe joint system shall meet all short and long-term pressure test requirements of AWWA C900 and AWWA C905, respectively.

b) The compound shall qualify for Hydrostatic Design Basis (HDB) of 4000 psi for water at 73.4 degrees F., in accordance with the requirements of ASTM D2837.

c) Nominal outside diameters and wall thicknesses of thrust-restrained pipe shall conform to the requirements of AWWA C900 and AWWA C905. Pipe shall be furnished in standard lengths of 20 feet/

d) PVC pipe shall be C900 DR 18 for sizes 8" to 12" and C905 DR 25 for sizes 14" to 36".

e) Green or white pipe shall be supplied, unless otherwise agreed upon at time of purchase.

f) Pipe and couplings shall be made from unplasticized PVC compounds having minimum cell classification of 12454, as defined in ASTM D1784.

g) Pipes shall be joined using non-metallic couplings which have been designed as an integral system for maximum reliability and interchangeability. High-strength flexible thermoplastic splines shall be inserted into mating precision-machined grooves in the pipe and coupling to provide full 360-degree restraint with evenly distributed loading. No external pipe-to-pipe restraining devices, which clamp onto or otherwise damage the pipe surface as a result of point-loading, shall be permitted.

h) Couplings shall be designed for use at the rated pressures of the pipe with which they are utilized, and shall incorporate twin elastomeric sealing gaskets meeting the requirements of ASTM F477. Joints shall be designed to meet the leakage requirements of ASTM D3139.

i) Every pipe and machined coupling shall pass AWWA C900/C905 hydrostatic proof test requirements.

j) Pipe shall be legibly and permanently marked in ink with the following

information:

1) Manufacturer and Trade Name
2) Nominal Size and DR Rating/Pressure Class
3) Hydrostatic Proof Test Pressure
4) (NSF-61)
5) Manufacturing Date Code

2.03 PVC PIPE JOINTS

A. The P.V.C. joints shall be of the push-on type so that the pipe and fittings may be connected on the job without the use of solvent cement or any special equipment. The joint seal shall be effected by a single rubber joint gasket designed to be assembled by the positioning of the continuous, molded rubber ring gasket in an annular recess and the forcing of the spigot end of the joining pipe into the socket, shall compress the gasket radially. The gasket and annular recess shall be designed and shaped so that the gasket is locked in place against displacement by mechanical means. Systems in which the gasket is held in place only by means of an adhesive agent shall not be considered equal to the mechanical anchorage and shall not be allowed. The rubber ring joint shall be designed for thermal expansion or contraction with a total temperature change of at least 75° F and shall meet the requirements of ASTM D3212. Lubricant furnished for lubricating joints shall be nontoxic, shall not support the growth of bacteria, shall have no deteriorating effects on the gasket or pipe material.

2.04 JOINTS FOR DISSIMILAR PIPE

A. Joints between pipes of different materials shall be made with a flexible mechanical compression coupling with No. 305 stainless steel bands as manufactured by Joints, Inc. of Gardena, California; Fernco Sealer Co., Ferndale, Michigan, or equal, or a concrete closure collar as directed by the Engineer.

2.05 PIPE BEDDING AND PIPE COVER MATERIALS

A. Pipe bedding material and trench backfill material shall be as specified in Section 02200.

PART 3 - EXECUTION

3.01 PIPE DISTRIBUTION

A. Distribute material on the job no faster than it can be used to good advantage. Unload pipe which cannot be physically lifted by workers from the trucks, by a forklift, or other approved means. Do not drop pipe of any size from the bed of the truck to the ground. Do not distribute more than one week's supply of material in advance of laying, unless otherwise approved by the Engineer.

3.02 PIPE PREPARATION AND HANDLING

A. Inspect all pipe and fittings prior to lowering into trench to insure no cracked, broken, or otherwise defective materials are being used. Clean ends of pipe thoroughly. Remove foreign matter and dirt from inside of pipe and keep clean during and after laying.

B. Use proper implements, tools, and facilities for the safe and proper protection of the work. Lower pipe into the trench in such a manner as to avoid any physical damage to the pipe. Remove all damaged pipe from the jobsite. Do not drop or dump pipe into trenches under any circumstances.

3.03 LINE AND GRADE

A. Do not deviate from line and grade, as established by the Engineer, more than 1/2-inch for line and 1/4-inch for grade, provided that such variation does not result in a level or reverse sloping invert. To account for permissible variation in the pipe wall thickness, the measurement for grade shall be at the pipe invert, not at the top of the pipe. The Contractor shall furnish and set the line and grade boards at maximum intervals of 25 feet. If grade boards prove impractical because of trench or other conditions, other methods of controlling line and grade (including laser beam) may be submitted to the Engineer for approval.

B. A substantial stake shall be driven on each side of the trench on a line at right angles to each stake of the primary line. A straight and even-edged 2-inch by 6-inch board shall be nailed or clamped to the stakes in a level position and at some even foot height above the grade line of the proposed sewer. The centerline of the proposed sewer shall be located by measurement from the primary line stake and marked upon the board. Not less than three such line and grade boards shall be set and immediately checked visually for errors in line and grade. As each additional board is placed, it shall be checked visually for error in line and grade. At least three boards shall be maintained at all times. During the laying of the pipe, a stout twill line shall be fastened to the boards at the center of alignment marks and pulled sufficiently tight to remove any noticeable or measurable sag. The line and grade of each pipe shall be obtained by measuring down from the string line by means of a plumbed grade pole.

C. The Contractor may use the laser beam method of maintaining line and grade upon approval of the Engineer. Prior to approval, the Contractor shall submit evidence to the Engineer that a qualified operator will handle the equipment during the course of construction. A "Caution-Laser Light" placard shall be mounted in a conspicuous place. When "in the pipe" method is used, grade boards will be required to install the first 50 feet of pipe, and the Contractor shall check the line and grade at any additional points at which offset stakes have been placed wherever so requested by the Engineer. If bending of the beam due to air temperature variations becomes apparent with "in the pipe" units, a fan shall be provided to circulate the air. However, air velocity shall not be so excessive as to cause pulsating or vibrating of the beam. If, in the opinion of the Engineer, the beam cannot be accurately controlled, this method of setting line and grade shall be discontinued. When the above ground method is used, the set-up shall be checked with three grade boards including one set at the upstream manhole. If the laser has a gradient indicator, two boards may be used to check the set-up. The grade board at the upstream

manhole shall be retained to be used as a check as pipe laying progresses.

3.04 PREPARATION OF TRENCH

A. Provide pipe bedding in accordance with Section 02200.

B. Excavate bell holes at each joint to permit proper assembly and inspection of the entire joint.

3.05 DEWATERING

A. Prevent water from entering the trench during excavation and pipe laying operations to the extent required to properly grade the bottom of the trench and allow for proper compaction of the backfill. Pipe shall be laid in the dry.

3.06 LAYING AND JOINTING CONCRETE PIPE AND FITTINGS

A. Pipe laying shall proceed upgrade with spigot ends pointing in direction of flow. After a section of pipe has been lowered into the prepared trench, clean the end of the pipe to be joined, the inside of the joint, and, if applicable, the rubber ring immediately before joining the pipe. Make assembly of the joint in accordance with the recommendations of the manufacturer of the type of joint used. Provide all special tools and appliances required for the joint assembly.

B. All pipe shall be laid uniformly to line and grade so that the finished sewer will present a uniform bore. Variations from line and grade in excess of the tolerances specified under LINE AND GRADE will be considered sufficient cause for rejection of the work.

C. Check pipe for alignment and grade after the joint has been made. The pipe bedding shall form a continuous and uniform bearing and support for the pipe barrel between joints. Apply sufficient pressure in making the joint to assure that the joint is "home" as defined in the standard installation instructions provided by the pipe manufacturer. Place sufficient pipe cover material to secure the pipe from movement before the next joint is installed to assure proper pipe alignment and joint makeup.

D. Pipe 21-inches and smaller intended to be in straight alignment shall be laid so the inside joint space does not exceed 3/8 inch in width. If interior joints on 24 inch and larger pipe laid either in straight alignment or on a curve are greater than 3/8 inch, thoroughly clean the joint surfaces, and fill and seal the entire joint with premixed mortar conforming to ASTM C-387 only after the trench has been backfilled, unless otherwise approved by the Engineer. Trowel smooth on the inside surface. Water shall not be allowed to rise in or around, or pass over any joint before it has substantially set.

E. When pipe is laid within a movable trench box, take all necessary precautions to prevent pipe joints from pulling apart when moving the box ahead.

F. Prevent excavated or other foreign material from getting into the pipe during the laying operation. Close and block the open end of the last laid section of pipe to prevent entry of foreign material or creep of the gasketed joints when laying operations are not in progress, at the close of the day's work, or whenever the workers are absent from the job.

G. Plug or close off pipes which are stubbed off for manhole construction or for connection by others with temporary plugs as specified in Section 01040 - Project Coordination.

H. Take all necessary precautions to prevent the "uplift" or floating of the line prior to the completion of the backfilling operation.

I. Make connections of non-reinforced pipe to manholes or concrete structures, so that a standard pipe joint is located not more than two feet from the outside edge of the structure.

J. When field cutting and/or machining the pipe is necessary, use only tools and methods recommended by the pipe manufacturer and approved by the Engineer.

K. After the pipe has been laid and sufficient backfill placed to prevent movement of the pipe, welding of the PVC liner at the joints of the concrete pipe may begin. All PVC liner shall be welded and tested in accord with the requirements stated herein prior to performing any leakage testing.

3.07 LAYING PLASTIC PIPE

A. Plastic (PVC) piping shall be installed in accordance with the details shown on the Drawings and applicable requirements of ASTM D-2321, "Standard Practice for Underground Installation of Flexible Thermoplastic Pipe" and the manufacturer's recommendations. Pipe Bedding as specified in Section 02200 will be used for PVC pipe unless directed otherwise by the Engineer. The pipe shall be backfilled with granular material and thoroughly compacted to 12-inches above the top of the pipe and thereafter backfilled as specified in Section 02200.

B. The Contractor shall use care in handling, storage, and installation of pipe. Storage of pipe on the job site shall be done in accordance with the pipe manufacturer's recommendation. Under no circumstances shall pipe be dropped into the trench.

3.08 EXCESS TRENCH WIDTH

A. Normal trench width shall be as defined on the Drawings. Where the normal trench width below the top of the pipe is exceeded for any reason, the Contractor shall, unless the Engineer determines that the pipe being used is strong enough for the actual trench width, furnish an adequate support for the pipe. This may be accomplished by furnishing a stronger pipe or a concrete cradle only when approved in writing by the Engineer and as described below.

B. The thickness of concrete under the pipe shall be one-third of the nominal diameter of the pipe, but not less than four inches. Concrete block or brick may be used for adjusting and maintaining proper grade and elevation of pipe. After the pipe is laid to line and

grade, place 3,000 psi concrete under the pipe and for the full width of the trench to form a cradle of the required length and thickness with the concrete brought up to a level equal to 1/4 of the inside pipe diameter below the springline of the pipe. Start and terminate the concrete cradle at the face of a pipe bell or collar. Do not encase pipe joints at the ends of the concrete cradle.

C. After the concrete has taken initial set, cover material shall be placed and compacted over the concrete cradle and up to a level 12 inches above the pipe barrel and for the full width of the trench. Cover material shall be placed by hand or by equally careful means.

3.09 CONNECTING DISSIMILAR PIPE MATERIALS

A. Connect dissimilar pipe materials by means of a flexible coupling or a concrete closure collar as directed by the Engineer. Install couplings in strict accordance with the manufacturer's recommendations.

B. Use concrete closure collars only when approved by the Engineer, and then only to make connections between dissimilar pipe when standard rubber gasketed joints or flexible couplings are impractical. Before the closure collars are poured, wash the pipe to remove all loose material and soil from the surface on which the concrete will be placed. Prepare PVC pipe by painting a minimum four inch wide band that will be in contact with the concrete with a thin coat of solvent cement and embed a layer of concrete or masonry sand in the cement before it sets to create a bonding surface. Wet nonmetallic, except PVC, pipe thoroughly prior to pouring the collars. Wrap and securely fasten a light gauge of sheet metal or building-felt around the pipe to insure that no concrete shall enter the line. Place reinforcement as shown on the Plans. Make entire collar in one pour using 3,000 psi concrete and extend a minimum of 12 inches on each side of the joint. The minimum thickness around the outside diameter of the pipe shall be six inches. No collar shall be poured in water. After the collars are poured and have taken their initial set, cure by covering with well-moistened earth.

3.10 PIPE BULKHEADS

Connections for future sewers shall be bulkheaded in the following manner:

A. All tees, wyes, sockets, and bell-and-spigot pipe sewers 18 inches in diameter or smaller shall be bulkheaded with caps or disc stoppers with factory-fabricated resilient joints. The disk or cap shall be banded or otherwise secured to withstand all test pressures without leakage.

B. Connections 21 inches and 24 inches in diameter shall be bulkheaded with a four-inch brick wall, using clay brick or concrete brick. The wall shall be capable of withstanding all test pressures without leakage.

C. Connections 27 inches in diameter and larger shall be bulkheaded with an eight-inch wall, using clay brick or concrete brick. The wall shall be capable of withstanding all test pressures without leakage.

3.11 LEAKAGE TESTS FOR GRAVITY SEWERS - GENERAL

A. Gravity sewers shall be required to pass a leakage test before acceptance. Leakage tests may be by the infiltration test or exfiltration test, depending on the level of the groundwater table or by the low-pressure air test all as described below. All testing shall be conducted in the presence of the Engineer or his designated representative.

B. Water infiltration or exfiltration or air loss rates will be measured with equipment supplied by the Contractor and shall be observed by the Engineer. The tests shall be performed by the Contractor under the observation of the Engineer.

C. The groundwater height for all test methods above the installed pipe shall be determined by attaching a transparent plastic tube to a pipe nipple in the manhole and using the plastic tube as a manometer.

D. The ends of branches, laterals, tees, wyes, and stubs to be included in a test section shall be plugged to prevent water or air leakage. All plugs shall be secured to prevent blowout due to internal pressure. A test section is defined as the length of sewer between manholes.

E. The Contractor shall repair all visible leaks in manholes and pipe, even though the leakage test requirements are met.

3.12 LEAKAGE TEST – INFILTRATION METHOD

A. The water infiltration test shall not be considered a valid leakage test unless the top surface of the groundwater level is at least seven feet (7') above the pipe crown during the test measurement. The rate of infiltration of water into the sewers, including manholes and appurtenances, shall not exceed 125 gallons per day per inch diameter per mile of sewer. In the event groundwater does not submerge the pipe as specified, the Contractor shall conduct an exfiltration test described hereinafter.

B. A visual inspection and an infiltration test will be conducted on all completed sewers 30 inches in diameter or larger when they are submerged by groundwater as specified above. The Contractor shall provide facilities to stop inflow from adjacent sections of sewer and to provide pondage to permit measurement of infiltration. Visible leaks, defective joints, and defective pipe shall be satisfactorily repaired or replaced.

3.13 LEAKAGE TEST – EXFILTRATION METHOD

A. Sewers not submerged by groundwater shall be tested for exfiltration or, if approved, by low-pressure air method. The Engineer reserves the right to waive the exfiltration test on any section of sewer based on his evaluation of the results of previous tests.

B. The hydrostatic head for test purposes shall be seven feet (7') above the sewer crown at the upstream end. The water level in the sewer shall be adjusted so that the hydrostatic head is seven feet minimum above the ground water level when the ground water level is higher than the pipe crown. Any arrangement of testing equipment which will provide observable and accurate measurement of water leakage under the specified conditions

will be permitted. The rate of exfiltration of water out of the sewers, including manholes and appurtenances, shall not exceed 125 gallons per day per inch diameter per mile of sewer. Visible leaks, defective joints, and defective pipe shall be satisfactorily repaired or replaced.

C. The sewer test section may be filled 24 hours prior to time of exfiltration testing, if desired, to permit normal absorption into the sewer pipe walls to take place.

3.14 LEAKAGE TEST – LOW-PRESSURE AIR METHOD

A. Test Procedure. The following test procedures shall be used in making each test:

1. The section of sewer line to be tested shall be flushed and cleaned prior to conducting the low-pressure air test to clean out any debris, wet the pipe, and produce more consistent results.

2. Isolate the section of sewer line to be tested by means of inflatable stoppers or other suitable test plugs. Each plug shall have an inlet/outlet tap, or other provision for connecting a hose to a portable air source at one plug and bleeding the air pressure off at the other plug.

3. If the test section is below the groundwater level, determine the height of the groundwater above the springline of the pipe at each end of the test section and compute the average. For every foot of groundwater above the pipe springline, increase the gauge test pressure by 0.43 pounds per square inch.

4. Connect the air hose to the inlet tap and a portable air source. The air equipment shall consist of necessary valves and pressure gauges to control the rate at which air flows into the test section and to enable monitoring of the air pressure within the test section. The testing apparatus shall be equipped with a pressure relief device to prevent the possibility of loading the test section with the full capacity of the compressor.

5. Add air slowly to the test section until the pressure inside the pipe is raised to 4.0 psig greater than the average back pressure of any groundwater that may be over the pipe.

6. After a pressure of 4.0 psig above the groundwater back-pressure is obtained, regulate the air supply so that the pressure is maintained between 3.5 and 4.0 psig (above the average groundwater Sack pressure) for a period of two minutes to allow the air temperature to stabilize in equilibrium with the temperature of the pipe walls.

7. Determine the rate of air loss by the time pressure-drop method. After the two-minute air stabilization period, disconnect the air supply and adjust the pressure to 3.5 psig above the average groundwater back pressure. The time required for the test pressure to drop from 3.5 psig to 2.5 psig shall be determined by means of a stopwatch and this time interval will be compared to the required time in the table below to determine if the rate of air loss is within the allowable time limit. If the time is equal to or greater than the times indicated in the table,

the pipeline shall be deemed acceptable.

8. The pressure shall be monitored by a recording type pressure gauge and a copy of the strip chart shall be given to the Engineer upon completion of the test. The chart shall show the initial pressurization of the sewer, the two minute stabilization time, the test period, and the bleed-off of the pressure at the completion of the test.

9. Upon completion of the test, the air pressure in the sewer shall be bled off slowly and from the end of the test section opposite to the location of the test pressure gauge. The reduction in air pressure shall be shown on the recording of the pressure test as described above.

B. For sewer diameter between 4 inches and 24 inches inclusive, the Pipe shall be tested between adjacent manholes. The test time for the air pressure to drop the specified one pound shall be as required by the following table.

1.0 PSIG AIR TEST PRESSURE DROP

Pipe Diameter	Minimum Time Lapse (min:sec)							
Inch	100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
4	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24
8	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24
10	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48
12	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38
15	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04
18	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
21	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31
24	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33

3.15 LAMP TESTING

A. Prior to final acceptance all sewers laid on a straight alignment shall be lamp tested. The test shall be performed by placing a bright source of light at one end of a manhole run and observing the light at the other end. The image of light projected through the sewer shall be a full or nearly full circular section. Pipe segments not passing this test shall be relayed to the correct alignment.

3.16 MANDREL TEST

A. The Contractor shall run a "Go-No-Go" rigid mandrel deflection test on PVC sewer mains. The mandrel shall be 95% of the pipe inside diameter. The Contractor shall furnish an approved mandrel suitable for accurately measure the maximum deflection of the main. The deflection shall be five (5) percent maximum at job acceptance. Any main which has deflection in excess of maximum shall be rejected and removed and replaced

by the Contractor with sufficient bedding to meet the deflection requirements at no cost to the Owner.

3.17 MANHOLE AND VACUUM TEST

A. All manholes installed in gravity flow sanitary sewerage systems shall be tested using an inflatable compression band, vacuum pump and appurtenances specifically designed for vacuum testing manholes. Test procedures shall be in accordance with the test equipment manufacturer's recommendations. Test equipment to be manufactured by Peter A. Glazier & Associates, Worchester, MA, or approved equal.

B. Manholes may be tested by vacuum test immediately after assembly of the manhole and connecting pipes and before any backfill is placed around the manholes. However, the final test and acceptance shall be based only upon a test after the manhole is backfilled and the cover frame castings are grouted in place.

C. All pipes entering the manhole shall be plugged, taking care to securely brace the plugs and pipe.

D. After the testing equipment is in place, a vacuum of ten inches (10") of Hg shall be drawn on the manhole. The manhole will be considered to have passed the test if the vacuum does not drop more than one inch (1") of Hg in one minute.

E. If the manhole fails the initial test, the Contractor shall locate the point(s) of leakage and make proper repairs, and retest until a satisfactory test result is obtained.

F. After the manholes have been backfilled, the cover frame casting sealed in place, vacuum tested, and prior to final acceptance of the project, any signs of leaks or weeping visible from the inside of the manhole shall be repaired and the manhole made watertight and retested in accordance with this specification.

G. The vacuum test shall be monitored by a recording type pressure/vacuum gauge and a copy of the strip chart shall be given to the Engineer upon completion of the test. The chart shall show the initial vacuum draw down, the test period, and a slow, controlled release of the vacuum.

3.20 FINAL ACCEPTANCE

A. Prior to final acceptance and final manhole-to-manhole inspection of the sewer system by the Engineer, flush and clean all parts of the system. Remove all accumulated construction debris, rocks, gravel, sand, silt, and other foreign material from the sewer system at or near the closest downstream manhole. If necessary, use mechanical rodding or bucketing equipment.

B. Upon the Engineer's final manhole-to-manhole inspection of the sewer system, if any foreign matter is still present in the system, reflush and clean the section and portions of the lines as required.

END OF SECTION

SECTION 02550
NATURAL GAS SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION

A This section of the specifications details requirements for work and materials to be used in connection with installing, constructing, laying, placing, etc., gas lines, gas valves, tracer wire/tape, valve boxes, test boxes and other gas system appurtenances detailed on the plans and in the other sections of these specifications. The CONTRACTOR'S attention is directed to the Proposal Form, Specifications and Plans to determine which type of material is to be used on this particular project. The CONTRACTOR shall provide all labor, materials, tools and equipment necessary to install all gas lines, tracer wire/tape valve boxes and appurtenances as shown on the Plans. The Work shall include excavation, sheeting and bracing, bedding, backfill, etc.

B. All work performed under this Contract shall comply to the requirements of the United States Department of Transportation, Office of Pipeline Safety, Part 192 of Title 49, Code of Federal Regulations "Transportation of Natural and Other Gas by Pipeline, Minimum Safety Standards, Part 199 "Drug Testing Pipeline Safety", and Part 40 "Procedures for Transporting Workplace Drug Testing Programs."

C. Any part, portion, or section of this Specification found to be in conflict with any part, portion, or section of Part 192, shall be considered null and void and the applicable part, portion or section of Part 192 shall be substituted therefor.

D. The Prime Contractor shall have the required licenses and shall perform all boring operations. No subcontractors may be utilized for this primary item of work in this Contract. Contractor shall be Certified in accordance with Pipeline Safety and Contractor shall furnish the Engineer with copies of the welder certifications and PE Fusion Certification prior to any work being done. Contractor shall be Certified in accordance with the Owner's Certification Requirement and for working on the Owner's Specific System.

PART 2 - PRODUCTS

2.01 STEEL GAS PIPE

A. All pipe installed in the transmission main shall be plain A.P.I. line pipe conforming to A.P.I. Std. 5L (latest edition with latest supplements) for Seamless or Electric-welded Grade B, Electric-furnace or open-hearth Bessemer.

B. All pipe installed in the distribution system shall be plain A.P.I. line pipe conforming to A.P.I. Std. 5L (latest edition with latest supplements) for Seamless or Electric-welded Grade B, Electric-furnace or open-hearth Bessemer or Butt-welded Bessemer.

C. All steel pipe shall be beveled for welding. All steel pipe smaller than 2.375" O.D. shall be furnished in at least twenty (20') foot lengths. All steel pipe 2.375" O.D. and larger shall be

furnished in double random lengths.

D. All steel pipe shall be marked in accordance with the above A.P.I. Specification. Said markings shall include the A.P.I. monogram. The Contractor shall provide the Engineers with mill test certificates indicating results of physical and chemical tests as required by the above A.P.I. Specification.

E. In the event that pipe for use in this project is manufactured by a mill which is not authorized to use the A.P.I. monogram, the Contractor shall provide the Engineers with certificates from an independent testing laboratory approved by the Engineers. These certificates shall indicate results of all chemical and physical tests as required by A.P.I. Standard 5L (latest edition with latest supplements). The cost of such testing shall be included in other items. No additional compensation shall be allowed.

F. Cathodic protection shall be provided for at locations where directed by the Engineer. Criteria for Cathodic protection shall be in accordance with the requirements set forth in the Federal Register, "Transportation of Natural and other Gas by Pipeline: Minimum Federal Safety Standards", Part 192; Department of Transportation, Office of Pipeline Safety.

G. The minimum wall thickness and weight of the various sizes of steel pipe installed in the transmission line and distribution system will be as follows:

Size Nominal (Inches)	Size O.D. (Inches)	Wall Thickness Minimum (Inches)	Weight Minimum (Lbs. per Ft.)
3/4	1.050	0.113	1.13
1	1.315	0.133	1.68
1 1/2	1.900	0.145	2.72
2	2.375	0.154	3.65
3	3.500	0.216	7.58
4	4.500	0.237	10.79
6	6.625	0.250	17.02
8	8.625	0.250	22.36

2.02 HIGH DENSITY POLYETHYLENE GAS MAIN (HDPE)

A. Gas lines, including pipe and fittings shall be made of polyethylene compound to ASTM D-1248 for Type III, Grade P34, Category 5 (ASTM Material Designation PE 4710). Pipe and fittings shall be rated for a minimum working pressure of 100 psi at 73.4 degrees Fahrenheit and shall conform to the latest edition of ASTM D-2513 "Standard Specifications for Thermoplastic Gas Pressure Piping", ASTM D-3261 "Standard Specifications for Butt Heat Fusion Polyethylene Plastic Pipe and Tubing" and ASTM D-2683 "Standard Specifications for Socket-Type Polyethylene Fitting for Outside Diameter Controlled Polyethylene Pipe and Tubing." Pipe and fittings shall be installed in accordance with manufacturer's recommendations. All connections shall be visually inspected by the ENGINEER prior to the CONTRACTOR installing or backfilling any of the pipe. All polyethylene pipe shall be visually inspected by the ENGINEER prior to the CONTRACTOR performing any backfilling.

B. All polyethylene pipe at the construction site shall be marked with Manufacturer's Batch Number. Markings shall consist of at least the following: manufacturer, product name or trade name, nominal diameter, material type, SDR value, applicable standards, and class rating.

C. Gas mains shall have a minimum SDR rating of 11, unless otherwise indicated on drawings.

D. Required Pipe Manufacturer Certifications shall be submitted to the Engineer. Pipe Manufacturer shall be submitted to the Engineer for review and concurrence with Owner's approved list of materials.

2.03 MEDIUM DENSITY POLYETHYLENE GAS PIPE (MDPE)

A. Gas lines, including pipe and fittings shall be made of polyethylene compound to ASTM D-1248 (ASTM Material Designation PE 2406). Pipe and fittings shall be rated for a minimum working pressure of 100 psi at 73.4 degrees Fahrenheit and shall conform to the latest edition of ASTM D-2513 "Standard Specifications for Thermoplastic Gas Pressure Piping", ASTM D-3261 "Standard Specifications for Butt Heat Fusion Polyethylene Plastic Fittings for Polyethylene Plastic Pipe and Tubing" and ASTM D-2683 "Standard Specifications for Socket-Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing." Pipe and fittings shall be installed in accordance with manufacturer's recommendations. All connections shall be visually inspected by the ENGINEER prior to the CONTRACTOR performing any backfilling. All polyethylene pipe shall be visually inspected by the ENGINEER prior to the CONTRACTOR installing or backfilling any of the pipe.

B. All polyethylene pipe at the construction site shall be marked with Manufacturer's Batch Number. Markings shall consist of at least the following: manufacturer, product name or trade name, nominal diameter, material type, SDR value, applicable standards, and class rating.

C. Gas main shall have a minimum SDR value of 11, unless otherwise indicated on drawings.

D. Required Pipe Manufacturer Certifications shall be submitted to the Engineer. Pipe Manufacturer shall be submitted to the Engineer for review and concurrence with Owner's approved list of materials.

2.04 COATING AND WRAPPING STEEL PIPE

A. Coating Steel Pipe shall be standard X-TRU-COAT, or approved equal, as applied by PLEXCO of Harvey, Louisiana, or any other approved X-TRU-COAT applicator.

B. The coating shall be applied as follows:

1. Steel Pipe shall be pre-heated.
2. Steel Pipe shall be steel shot cleaned to produce a slightly stippled surface.

3. The Modified Rubber Blend Adhesive shall be applied to the minimum thickness recommended by the manufacturer.
4. The High Density Polyethylene is extruded to the pipe surface in accordance with the recommendation of the manufacturer.
5. Water bath for quenching to shrink and cure the polyethylene coating.
6. Identification - Apply trade name X-TRU-COAT or other coating used.
7. Electrical inspection at 10,000 volts to detect coating flaws.

2.05 STEEL VALVES

A. The following are standard valve specifications and shall apply only in sizes required for completion of the project:

1. All valves used in the gas transmission line and distribution system, except service cocks, shall be wrench operated, lubricated type plug valves. These valves shall be as manufactured by the Rockwell-Nordstrom Valve Company, or approved equal.

2. Companion flanges shall be furnished and welded to the pipe at valve locations in the transmission line and distribution system. The cost of this work shall be included in the price bid for valves.

3. Valves on H.P. transmission lines, 2" and larger will be as specified in the Special Conditions of the Specifications.

4. Valves on H.P. transmission lines, 3/4", 1" and 1-1/2" size shall be 500 pound., Rockwell-Nordstrom Semi-Steel valves, flanged and wrench operated, Figure No. 525, or approved equal. However, when valves of these sizes are used in service lines, etc., a Mueller H-17656 Valve Tee may be used. Valves on distribution system lines in size 6" to 8" diameter shall be 200 pound Rockwell-Nordstrom Semi-Steel valves, flanged and wrench operated, Figure No. 143, or approved equal.

5. All 2", 3" and 4" valves on distribution system lines shall be 175 pound, Rockwell-Nordstrom Semi-Steel valves, style 38 Dresser end and wrench operated, Figure 23141 with conducting gasket, or approved equal.

6. All 3/4" through 2" service cocks shall be Mueller No. H-11175 Lub-O-Seal Gas Meter Stops, or approved equal.

7. All valves on transmission and distribution mains, not service cocks, shall be equipped with 2" square shank adaptor operating nuts. Adaptors shall be installed on the valves and set screws tightened before valves are installed in the system.

8. The Contractor shall also furnish one each heavy duty valve handle for each size valve in each installed regulator station, manufactured by valve manufacturer.

9. All service cocks shall be provided with a Mueller Type H-10090 Sealing Device, or approved equal.

10. All valves and cocks shall be adjusted and serviced according to the manufacturer's specifications before being installed in the system and shall be installed in an open

position with lubricating screw in a half out position.

2.06 POLYETHYLENE GAS VALVES

A. Gas valves shall be polyethylene valves for gas distribution pipelines (ASTM Material designation PE 4710) and shall conform to ASTM D-3261-85 "Standard Specifications for Butt Head Fusion Polyethylene Plastic Fittings for Polyethylene Plastic Pipe and Tubing and ASTM D2683-85 "Standard Specifications for Socket-Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing".

B. Valve Manufacturer shall be submitted to the Engineer for review and concurrence with Owner's approved list of materials.

2.07 VALVE LUBRICATION

A. All valves shall be provided with a combination button head fitting and lubricant screw.

B. The Contractor shall provide four (4) sticks of the proper size lubricant specified for each valve, three of which shall be used to lubricate each valve prior to installation in the system.

C. Lubricant sticks shall be of the grade recommended for natural gas service by the manufacturer of the valve.

D. All service cocks shall be fully lubricated at the time of installation with Mueller Type H-853 lubricate or equal. In addition, the Contractor shall provide the Owner with one-pound lubricant, in unopened containers, for each one hundred (100) service cocks provided.

2.08 VALVE BOXES

A. Valve boxes on 4" and smaller valves shall be two sections sliding type adjustable valve boxes, Mueller No. H-10364, size 562-A, or approved equal.

B. Valve boxes on 6" and larger valves shall be three section adjustable valve boxes, Mueller No. H-10380, size AA with No. 140 Dome Base or approved equal.

C. In the event the valve must be installed at a below normal depth, a suitable valve box extension shall be provided to adjust the top of the box to the roadway or ground level. Cost of furnishing and installing valve box extensions shall be included in other items; no additional compensation will be allowed.

D. All valve boxes shall be provided with cast iron covers on which the word "GAS" is printed in raised letters.

E. All valve boxes shall have a 6"thick by 1'-0" concrete ring around the top of the box or concrete pad as detailed on the Plans. The cost of this concrete ring shall be included in the unit price bid for the valve. No additional compensation shall be allowed.

F. To eliminate any possible transfer of loads from the valve box to the valve, the Contractor shall furnish and install masonry or other approved supports beneath all valve boxes as

detailed on the Plans.

2.09 CASING PIPE

A. All mains and laterals crossing state highways and railroads shall be encased in a steel pipe of larger diameter. This casing pipe shall have a minimum wall thickness of 0.500 inches and shall extend through the railroad and roadway at least from ditch to ditch line and across the roadway right-of-way a distance designated on the Plans.

B. All casing shall be installed with an even bearing throughout its length and with a slope to one end. Due care shall be taken to prevent a waterway from forming adjacent to the casing.

C. Casing vents shall be provided and fabricated from 2" or larger pipe and installed as indicated on the standard detail sheet of the Plans.

D. The Contractor shall also install the insulator spacers and end seals. The cost of these and all other work incidental to the installing of the casing shall be included in the unit price bid.

E. Typical examples of casing installation are shown in the detail section of the Plans.

F. Casing pipe shall be steel having a minimum yield strength of 35,000 psi, conforming to A.P.I. Specification 5L. Casings shall have the following minimum wall thicknesses:

Size (Nom. Diam.)	Thickness
Under 12" I.D.	0.500"
14" and 16" O.D.	0.281"
18" O.D.	0.313"
20" O.D.	0.344"
24" O.D.	0.375"
26" O.D.	0.438"
28" and 30" O.D.	0.469"
32" O.D.	0.500"
34" and 36" O.D.	0.532"
38",40", and 42" O.D.	0.563"

G. The exterior of the pipe shall have a bituminous coating.

H. Upon written permission of the approving agency (Railroad Company or Highway Department) and the Engineer, The Contractor may be permitted to substitute reinforced concrete culvert pipe or bituminous coated corrugated metal pipe for steel casing pipe specified above, provided that the substituted pipe conforms to the approving agency's specifications.

I. Joints shall be butt welded. Coatings shall be continuous at the joints.

J. The carrier pipe shall be supported by utilizing three way to concentric casing cradle as manufactured by Pipeline Seal and Insulator Company, APS Casing Spacers or equal.

K. Casing seals, which seals the annulus between the casing and carrier pipe, shall be made of cement grout or bituminous material. Manufactured casing seals shall be by Pipeline Seal and Insulator Company, APS Casing Spacers or equal.

2.10 SERVICE TAPS ON MAINS (NOT USED)

A. Service taps into steel distribution lines shall be made with Mueller No. H-17650, No-Blo Service tee. Service tees shall be drilled as follows: 3/8" for ¾" service pipe, 1" for 2" service pipe, and 1-1/4" for 2" service pipe.

B. Service taps for all size services on the transmission main shall be with a 1" Mueller #H-17800 curb valve tee as detailed on the Plans. These service tees shall be drilled with a 1/4" drill only. Each curb valve tee shall be equipped with a curb box, Mueller No. H-10317 or approved equal. Service taps into polyethelynene distribution lines shall be made with a 3/4" Phillips Tapping Tee.

PART 3 - EXECUTION

3.01 TESTING PIPE COATING

A. The Contractor shall include in the price per linear foot bid for the transmission main and for all distribution lines 1/2" and larger, the cost of furnishing all equipment, tools, labor, materials, incidentals, etc., necessary to conduct "Holiday" tests on said pipe after joints have been made and coated and before lowering the pipe into trench. All defects found shall be repaired before lowering the pipe into the trench. No additional compensation shall be allowed for such repairs. All tests shall be made in the presence of a representative of the Engineer.

B. The holiday detector shall be capable of producing a spark of 2" in length minimum at all times.

C. The Contractor shall submit to the Engineers for approval the type and name and address of the manufacturer of the holiday detector.

3.02 LAYING STEEL PIPE

A. Before being placed in the trench, all pipe shall be carefully examined for defects and the inside of the pipe swabbed clean. The bottom of the trench shall be conditioned such that the pipe will have a bearing on earth along its entire length. Where joints occur, the trench shall provide ample room for connecting the pipe in an efficient and satisfactory manner.

B. Each length of pipe as it is laid in the trench, shall be carefully aligned with the pipe already laid. Flanged and bolted joints shall be made up with proper gaskets, without tightening the bolts unevenly, and without causing undue stress in the joints. Threaded joints shall be thoroughly cleaned with a wire brush before applying joint compound and they shall be made up without crossing the threads.

C. All pipe bends in steel pipe in the system shall be made cold and shall be made without kinking, wrinkling or flattening the pipe. The Contractor shall provide the proper bending shoe or other satiable equipment to perform this operation in a manner satisfactory to the Engineers.

D. All short bends in the system shall be made with standard weight long radius welding fittings, Tube Turn, or approved equal. Lateral connections shall be made using the proper fittings, Tees, Y's, etc.

E. Where work is suspended at night or for any other reason, the open ends of the pipe line shall be securely plugged or closed so as to prevent the entrance of water, animals and other foreign matters.

3.03 JOINTS IN STEEL GAS PIPING

A. Screw Joints shall be carefully wiped or brushed to remove grease applied at the factory. All dirt and grit shall be removed between threads, and "X-Pando" or other approved joint compound shall be applied on the threads to serve as a lubricant when making up. Care must be taken to avoid crossing threads.

B. Flanged Joints shall be made up with suitable composition gaskets and bolts shall be tightened such that no undue stress is placed upon pipe members or fittings.

C. Welded Joints for steel pipe shall be butt welded with acetylene or shielded metal arc-welding equipment unless other welding methods are submitted to and approved by the Engineers.

Surfaces to be welded shall be free from loose scale, rust, and other foreign materials. Piping shall be carefully aligned before welding and shall be maintained in alignment during welding. Welds shall be sound throughout, shall be fused thoroughly, and shall be free from gas pockets, surfaces porosity and other defects. Welds shall be free from overlaps, undercuts and excessive convexity, and shall be guaranteed leak proof at testing pressure.

No arc welding shall be permitted on pipe 2" and smaller, nominal diameter.

Welded joints found unsatisfactory shall be remade, or if re-welding cannot be done satisfactorily, new pipe and fittings shall be provided at the Contractor's expense. Before re-welding, the surface shall be cleaned thoroughly, and properly prepared. Peening and caulking of welds will not be permitted.

No welder will be permitted to perform under this contract until after he has been certified as proficient in both shielded metal arc and oxyacetylene welding, according to the provisions of A.P.I. Standard 1104, as amended.

Each welder shall make samples of his work using materials and procedures for this Contract. Each sample shall be properly marked and sent to an approved testing laboratory for evaluation. Until a favorable report is returned from the laboratory, he will not be permitted to weld.

The cost of these tests and the fees charged by the laboratory shall be included in other items. No additional compensation shall be allowed.

Contractor shall be responsible for qualifying all welding procedures to be used on this construction. No additional compensation shall be allowed.

3.04 LAYING POLYETHYLENE GAS PIPE

A. General

Gas Piping shall be installed in accordance with ASTM D2774-72 "Standard Recommended Protective for Underground Installation of Thermoplastic Pressure Piping." Proper implements, tools and facilities satisfactory to the ENGINEER shall be utilized by the CONTRACTOR for the safe and efficient execution of the Work. All pipe, fittings, valves and accessories shall be carefully lowered into the trench using suitable equipment in such manner as to prevent damage to pipe fittings. Under no circumstances shall the pipe or accessories be dropped or dumped into the trench. A minimum cover of 36" shall be maintained between the top of the trench and top of the pipe.

B. Inspection Of Pipe And Accessories

The pipe and accessories shall be inspected for defects prior to lowering into trench. Any defective, damaged or unsound material shall be repaired or replaced as directed by the ENGINEER.

C. Pipe Kept Clean

All foreign matter or dirt shall be removed from the interior of the pipe before lowering into position in the trench. Pipe shall be kept clean by means approved by the ENGINEER during and after laying. All openings to the pipe shall be closed by suitable means at all times except as the actual progress of the Work may require. Stub ends and fittings installed for further connection shall be closed with plugs or caps normally used for that purpose.

D. Joints

All joints shall be made in accordance with manufacturer's recommendations. A "Bull-Horn" type connection where a heat fuse connection is required will not be accepted. The CONTRACTOR will be required to cut out the "Bull-Horn" section and make a new acceptable splice at no additional cost or contract adjustment.

E. Tracers For Non-Metallic Pipe (REQUIRED ON ALL PIPE INCLUDING DIRECTIONALLY DRILLED INSTALLATIONS)

High Strength Directional Drilling (#10 or thicker) Tracer Wire for non-metallic pipe shall be provided. Tracer Wire shall be in accordance with 49CFR, Part 192.321. Plastic pipe that is not encased must have a plastic bonded electrically conducting wire as a means of locating the pipe underground. Tracer wire may not be wrapped around the pipe and contact with the pipe must be minimized but is not prohibited.

Tracer wire installed for pipe locating purposes must be resistant to corrosion damage. Tracer Wire shall have no splices.

Tracer wire must be protected at all times to prevent damage. A continuity/connectivity test shall be conducted and witnessed by the Engineer prior to acceptance.

On open cut installations, a "Warning/Cautionary Tape" shall be placed over the pipe approximately 12" below the natural ground level. The "Warning/Cautionary Tape" shall be 2" wide, orange in color, and shall be marked "WARNING/CAUTION BURIED GAS LINE BELOW", and shall be of non-corrosive manufacture.

Service pipe shall have the same wire laid six inches (6") above the top of the service pipe and project one (1) foot into or alongside each meter.

3.05 PLACING VALVES AND FITTINGS AND TEST STATIONS

A. Valves fittings and test stations shall be placed in the location indicated on the Plans and as directed by the ENGINEER.

B. All underground valves shall be set vertically. Boxes shall be set with covers flush with the surface of the adjacent ground, street, etc.

C. Before being placed in the trenches, all valves, meters, fittings, etc., shall be carefully examined by the Contractor are in good working order and are clean.

3.06 JACKING AND BORING PIPE

A. General

Where pipe is to be laid beneath railroads, Federal Highways, State Highways, and concrete pavement, jacking and boring will be required. The Contractor will not be permitted to open cut.

The requirements of the approving agency, such as railroad or State Highway Department, shall govern over these Specifications and Plans.

Sub-surface operations resulting in damage to the tracks or pavement, shall be the responsibility of the Contractor and shall be repaired at no cost to the OWNER.

B. Jacking and Boring Casing Pipe:

Installing of steel casing pipe shall conform to the A.R.E.A. Manual for Railway Engineering and Louisiana Standard Specifications for Roads and Bridges, Sections 7 and 8, latest edition.

Where the ends of pipe used as casing for other pipe are below ground, the ends shall be sealed.

The barrel of the carrier pipe shall be supported within the casing. Supports or carrier runners shall be spaced as recommended by the manufacturer, or as directed by the ENGINEER.

3.07 INSTALLING SERVICE ASSEMBLIES

A. Contractor shall furnish all service meters, service regulators, fittings, bushings, meter loops, insulating pipe unions, safety relief valves, and sut trap required and shall install the assemblies as specified herein and in the General Conditions.

1. Dust Traps

Dust traps for 3/4" and one inch services shall be straight through type as manufactured by the Sprague Meter Company, or approved equal.

2. Safety Relief Valves

For service assemblies using a regulator without internal relief valve (usually Nos. 6 and 7), the Contractor shall furnish and install a 2" Fisher Series 289 H safety relief valve, or approved equal, set to relieve at pressure designated by Engineer.

For service assembly No. 1 high pressure the safety relief shall be a 3/4" Fisher Series 1805 or equal set to relieve at pressure designated by the Engineers.

3. Insulated Unions

The Contractor shall provide insulating unions where noted on the Plans. These unions shall be as manufactured by Universal Controls, Dallas, Texas, or approved equal.

4. Meter Loops

All meter loops will be as manufactured by the Sprague Meter Company, or approved equal, dimensioned as shown on the Plans.

3.08 SERVICE CONNECTION ASSEMBLIES

A. Service connection assemblies shall include service tee as specified and service cock with sealing device with open end plugged.

B. For purposes of classifying, the following connection assemblies have been set up:

Service Connection Assembly No. 1 - for 3/4" service
Service Connection Assembly No. 1 - for 1" service
Service Connection Assembly No. 1 - for 2" service

C. Service assembly for H.P. transmission services shall include valve tee, valve box, H.P. cut off valve tee , Type "D" regulator, safety relief valve, guard rail and wing lock stop as

outlined in Specifications and detailed on the Plans. This until shall be classed as Service Connection Assembly No. 1 H.P. Contractor shall furnish and install this item complete as detailed with the exception of the Type "D" regulator which shall be furnished by the Owner.

3.09 TESTING GAS PIPING

A. All tests shall be conducted in the presence of the Engineer.

B. For these tests, the Contractor shall furnish suitable testing plugs or caps for the pipe, all necessary compressors, pipe connections, recording gauges and other equipment, together with all labor required.

C. All breaks, leaks, or defects in the pipe, valves and fittings shall be repaired and made good by the Contractor at no additional cost to the Owner, following which the lines shall be retested until the test requirements have been fulfilled.

D. Post-Installation Air Test:

i. The Engineer shall be notified a minimum of 72 hours in advance of the pressure testing. Gas Main shall be tested with compressed air and shall be applied by means of a compressor or other suitable means. The pressure for the air test shall be 1.5 times the pipe's MAOP (but never less than 100psi) and shall be maintained for a period of twenty-four (24) hours without pressure drop. A recording gauge shall be used to measure the pressure. The original chart recording shall be provided to the Engineer. The original charts made by the recording gauge during the test shall be of such condition and appearance that they can be reproduced for filing with the proper authorities.

ii. Before the air test is made on the one mile sections "Pig" (Type JRN or RCN 50, manufactured by T.D. Williamson, Inc., or equal) shall be passed through the entire section to be tested. [OPTIONAL] – DESIGN ENGINEER DELETE OR KEEP

iii. Pipe shall be tested in sections not exceeding one (1) mile in length. and shall be maintained without pressure drop for at least 24 hours. A sensitive recording gauge attached to the pipe at a convenient point shall be used to measure the pressure.

E. Pipe Installation by Trenchless Methods:

i. At the completion of the boring operation, the carrier pipe shall be checked for excessive deflection. Maximum of 7.5 percent deflection or as recommended by the pipe manufacturer.

iv. Wirelining of the Bore with locator inside drilling stem and digital output of the comprehensive Bore Profile shall be required and provided to the Engineer. The comprehensive Bore Profile shall be provided with a signature Certifying that the Contractor has provided all required minimum covers and clearances from all other existing and proposed utilities. [OPTIONAL] – DESIGN ENGINEER DELETE OR KEEP

G. For service pipe, all services shall be tested at one hundred (100) pounds pressure for ten

minutes without drop. This test shall be made after installation is complete but before main has been tapped and before trench has been backfilled.

H. Service lines on the H.P. transmission main shall be individually tested to the same pressure as the H.P. transmission main after the transmission main has been completely tested. This pressure shall be maintained without pressure drop for at least twenty-four (24) hours.

3.10 WELDING

A. Contractor's attention is directed to Section 16.14, JOINTS IN GAS PIPING, as regards to qualifications of both Welders and Welding Procedure.

B. Reproduced herein, for Contractor's use, is Article 192.222, "Qualification of Welding Procedures"; Article 192.229, "Limitations on Welder's"; Article 192.231, "Protection from Weather"; Article 192.223, "Meter Joints"; and Article 192.235, "Preparation for Welding", from the latest revision of the Code for Transportation of Natural and Other Gas by Pipeline; Minimum Safety Standards. These Standards are to be complied with.

"Section 192.225(a) is revised to read as follows:

S192.225 QUALIFICATION OF WELDING PROCEDURES

(a) Each welding procedure must be qualified under Section IX of the 1974 edition of the ASME Boiler and Pressure Vessel Code or Section 2 of the 1973 edition of the API Standard 1104, whichever is appropriate to the function of the weld, except that a welding procedure qualified under Section IX of the 1968 edition of the ASME Boiler and Pressure Vessel Code before July 1, 1976, or Section 2 of the 1968 edition of API Standard 1104 before March 20, 1975, may continue to be used but may not be requalified under that edition.

(b) When a welding procedure is being qualified under Section IX of the ASME Boiler and Pressure Vessel Code, the following steels are considered to fall within the P-Number 1 grouping for the purpose of the essential variables and do not require separate qualification of welding procedures:

(1) Carbon Steels that have a carbon content of 0.32 percent (ladle analysis) or less.

(2) Carbon Steels that have a carbon equivalent (C+1/4 Mn) of 0.65 percent (ladle analysis) or less.

(3) Alloy Steels with weld ability characteristics that have been shown to be similar to the carbon steels listed in subparagraphs (1) and (2) of this paragraph.

Alloy steels and carbon steels that are not covered by subparagraph (1), (2), or (3) of this paragraph requires separate qualification of procedures for each individual pipe specification in accordance with sections VIII and IX of the ASME Boiler and Pressure Vessel Code.

8 Each welding procedure must be recorded in detail during the qualifying tests. This record must be retained and followed whenever the procedure is used.

Section 192.227 (a) (1) is revised to read as follows:

S 192.227 QUALIFICATION OF WELDERS

(a) Except as provided in paragraph 8 of this section, each welder must be qualified in accordance with one of the following:

(1) Section IX of the latest edition of the ASME Boiler and Pressure Vessel Code or, if qualified before July 1, 1976, the 1968 edition, except that a welder may not requalify under the 1968 edition.

(2) Section 3 of API Standard 1104.

(b) When a welder is being qualified under Section IX of the ASME Boiler and Pressure Vessel Code, the following steels are considered to fall within the P-Number 1 grouping for the purpose of essential variables and do not require separate qualifications:

(1) Carbon steels that have a carbon content of 0.32 percent (ladle analysis) or less.

(2) Carbon steel that have a carbon equivalent (C+1/4 Mn) of 0.65 percent (ladle analysis) or less.

(3) Alloy steels with weld ability characteristic that have been shown to be similar to the carbon steels listed in subparagraphs (1) and (2) of this paragraph.

Alloy steels and carbon steels that are not covered by subparagraph (1), (2), or (3) of this paragraph require separate qualification of welders for each individual pipe specification in accordance with section VIII and IX of the ASME Boiler and Pressure Vessel Code.

(4) A welder may qualify to perform welding on pipe to be operated at a pressure that produces a hoop stress of less than 20 percent of SMYS by performing an acceptable test weld, for the process to be used, under the test set forth in Section I of Appendix C to this part. A welder who makes welded service line connection to mains must also perform an acceptable test weld under Section II of Appendix C to this part as a part of his qualifying test. After initial qualification, a welder may not perform welding unless:

(1) Within the preceding 12 calendar months, he has requalified; or

(2) Within the preceding 6 calendar months, he has had:

(I) A production weld cut out, tested and found acceptable in accordance with the qualifying test; or

(ii) For welders who work only on service lines 2 inches or smaller in diameter, two sample welds tested and found acceptable in accordance with the test in Section II of Appendix C to this part.

S 192.229 LIMITATION ON WELDERS

(a) No welder whose qualifications is based on nondestructive testing may weld

compressor station pipe and components.

(b) No welder may weld with a particular welding process unless, within the preceding 6 calendar months, he has engaged in welding with that process.

(c) No welder who is qualified under S 192.227 (a) may weld unless; within the preceding 6 calendar months, he has at least one weld tested and found acceptable under either Section 3 or 6 of API Standards 1104.

S 192.231 PROTECTION FROM WEATHER

The welding operation must be protected from weather conditions that would impair the quality of the completed weld.

S 192.233 MITER JOINTS

(a) A miter joint on steel pipe to be operated at a pressure that produces a hoop stress of 30 percent or more of SMYS may not deflect the pipe more than 3%.

(b) A miter joint on steel pipe to be operated at a pressure that produces hoop stress of less than 30 percent, but more than 10 percent of SMYS may not deflect the pipe more than 12-1/2% and must be a distance equal to one pipe diameter or more away from any other miter joint, as measured from the crotch of each joint.

(c) A miter joint on steel pipe to be operated at a pressure that produces a hoop stress of 10 percent or less of SMYS may not deflect the pipe more than 90%.

S 192.235 PREPARATION FOR WELDING

Before beginning any welding, the welding surfaces must be clean and free of any material that may be detrimental to the weld, and the pipe or component must be aligned to provide the most favorable condition for depositing the root bead. This alignment must be preserved while the root bead is being deposited.

Contractors shall have each welder qualified for work on this Contract. No previous qualification will be acceptable."

3.11 PIPE FUSING

All polyethylene pipe shall be fused and installed by a certified technician with certification and credentials filed with the OWNER before work begins.

3.12 CATHODIC PROTECTION FLANGE INSULATION AND MONITOR POINTS

A. Contractor shall furnish and install insulating material to electrically isolate sections of pipe line.

B. Flange insulating material, including full face gaskets and bolt insulation sleeves and washer, and test leads, shall be installed in accordance with the details given on the Plans.

C. Flange insulation of valves with welding neck flanges shall be installed and tested before the valve is welded into the pipe line, unless otherwise directed by Engineers. Flanges installed prior to insulation must be carefully aligned. Leads shall be attached prior to field coating of coating cutbacks and valves.

D. Completed insulated flanges, including flanges insulated and tested prior to welding-in, shall be electrically tested in the presence of the Engineer and to his satisfaction and before backfilling. The leads shall be brought into a curb valve box, (Mueller No. H-10317, or approved equal) and left bonded (shorted) in the curb valve box.

E. The cost of installing these flange insulating sets with test leads and curb valve box shall be included in the unit price bid for Plug Valves with Box. No additional compensation will be allowed.

F. Contractor's attention is directed to the following. If the insulating gasket furnished does not have the proper sealing surfaces, it is the Contractor's responsibility to include the proper asbestos gasket on each side of the insulating gasket to effect proper sealing of the joint. The cost of extra gaskets, if furnished, are to be included in the cost of other items. No additional compensation is allowed.

3.13 ANTI-DRUG PROGRAM FOR PIPELINE PERSONNEL

A. Contractors wishing to submit bids must provide certification that they have complied with DOT pipeline safety standards in 49 CFR Part 192, 193, or 195.

3.14 TRENCHING

A. Trenching for installation of the supply (transmission) mains shall be such that the pipe will have a minimum cover of thirty-six (36") inches below grade.

B. The maximum permissible width of cut shall be as follows: for pipe less than six (6") inches in diameter, twelve (12") inch trench; for pipe six (6") inches in diameter and greater, the trench width shall not exceed twice the diameter of the pipe.

C. Where subsurface obstructions are encountered in the above trenching, the Contractor will be permitted to lay pipe above the obstruction if the minimum cover require can be obtained while providing a cushion between the bottom of the pipe and the top of the obstruction at least twelve (12") inches for transmission lines and six (6") inches for distribution mains.

D. Where this minimum cover cannot be obtained, the Contractor will be required to lay pipe under the obstruction and he will receive no additional compensation for constructing the line in this manner.

E. All shade trees, telephone poles, power poles, etc., along the line of work shall be protected, and sufficient barricades, lanterns, etc., shall be provided for the protection of the public.

F. The Engineers reserve the right to control the length of trench opened in advance of pipe installation if, in their opinion, the laying of pipe is not proceeding fast enough to complete the installation and backfilling within a reasonable length of time.

3.15 MAINS AND LATERIALS UNDER PAVED STREETS OR ROADWAYS

A. Where mains and laterals are to be held beneath roadway paving on roadways, they shall be installed by means of a boring machine, auger or by means satisfactory to the Engineers. In the event subsurface operations result in injury or damage to the pavement, repairs to this pavement shall be made by the Contractor at no additional cost to the Owner. In the event paving cracks on either side of the pipe line, or is otherwise disturbed or broken due to the Contractor's operations, he shall repair or replace same at his own expense without further compensation.

B. In cases where no other practical method for installation is available, the Contractor, with the permission of the Engineers, may be permitted to cut the pavement if the area is not within a state roadway. He shall in no case make any continuous open cut more than twenty-five (25') feet in length through any concrete or concrete base roadway pavement except with specific consent of the Engineers, a brace or undisturbed pavement no less than two (2') feet in width shall be left across the trench at such intervals as the Engineer may direct. These braces shall remain undisturbed until the Contractor is ready to repave the cut.

C. All mains and laterals crossing paved state highways shall be encased in a pipe of larger diameter where indicated. This casing shall extend through the highways at least from ditch line to ditch line. Casing for the pipelines shall be vented in an approved manner.

3.16 MAINS AND LATERALS UNDER DRIVEWAYS AND SIDEWALKS

A. Where mains and laterals are to cross under concrete or brick driveways/sidewalks, the Contractor will be required to install them by means of a boring machine, auger or by other means satisfactory to the Engineers. Where it become necessary to cut and replace the driveway/sidewalk, it shall be cut by use of a concrete saw and replaced as soon as practicable after the trench has been backfilled and tamped.

3.17 SURFACE OBSTRUCTION

A. All buildings, walls, fences, poles, bridges, railroads, trees, and other property or improvements encountered shall be carefully protected from all injury, and in the event that

any of the foregoing are damaged or removed during the progress of the work they shall be repaired or replaced in a satisfactory manner within a reasonable time. Special care must be exercised in trenching under or near railroads in order to avoid or minimize delays or injuries resulting therefrom.

3.18 SUBSURFACE OBSTRUCTIONS

A. In excavating, backfilling, and laying pipe, care must be taken not to remove, disturb, or injury other pipes, conduits, or structures, without the approval of the Engineer. If necessary, the Contractor, at his own expense, shall sling, shore up, and maintain such structure in operation and within a reasonable time shall repair any damage done thereto. Repairs to these facilities shall be made to the satisfaction of the OWNER of the damaged facility.

B. The Contractor shall give sufficient notice to the interested utility of his intention to remove or disturb any other pipe, conduit, etc., and shall abide by their regulations governing such work.

C. In the event that subsurface structures are broken or damaged in the prosecution of the work, the Contractor shall immediately notify the proper authorities, and at the option of said authority, either repair the damage at once at his own expense, or pay the utility the proper charges for repairing said damage. The Contractor shall be responsible for any damage to persons or property caused by such breaks or due to his own neglect in reporting and/or repairing such damage.

D. Delays, such as would result in buildings being without service overnight or for needlessly long periods during the day, will not be tolerated, and the Owner reserves the right to make repairs at the Contractor's expense without prior notification. Should it become necessary to move the position of a pipe, conduit or structure, it shall be done by the Contractor in strict accordance with instructions given by the Engineers or the utility involved.

E. The Owner or Engineer will not be liable for any claim made by the Contractor based on underground obstructions being different than that indicated in the Contract Documents. Where ordered by the Engineers, the Contractor shall uncover subsurface obstructions in advance of construction so that the method of avoiding same may be determined before pipe laying reaches the obstruction.

3.19 BACKFILLING

A. Backfilling shall begin as soon as possible after installation of the pipe. A maximum of one day's trenching may remain open overnight.

B. In backfilling all trenches, the excavated material shall be thoroughly compacted around and to a depth of six (6") inches above the pipe for the entire length or the trench. The remaining portion of the trench shall be backfilled and thoroughly compacted for the entire length of

the trench and left in a lightly overfilled and crowned condition. The method of compacting trenches shall be approved by the Engineers.

C. Backfilling of all trenches crossings, or in all sidewalks and surfaced areas and shoulders of improved streets shall be filled and power tamped in six (6") inch layers.

D. All excavated material shall be cleared from adjacent street surfaces, gutters, sidewalks, parkways, railroads, grass plots, etc., and the whole shall be left in a tidy and acceptable condition. All surplus material shall be removed by the Contractor.

3.20 PLANKING

A. In all locations where street surfacing (concrete, brick, or asphalt) has been cut, the trench shall be backfilled and compacted, as specified in Section 16.28 of the Specifications, to within three (3") inches of the top of the surfacing. The Contractor shall then place planking of 3" thickness over the entire length and width of the cut portion of the surfacing. This planking shall be tied together by spiking 2" X 4" ties to the underside at 3 ft. spacing.

B. The top of the planking shall be maintained at street elevation until the Contractor is directed by the Engineers to remove the planking and replace the street surfacing.

C. The cost of this planking shall be included in the price bid for other items. No additional compensation shall be allowed.

3.21 REPLACING STREET SURFACING AND SIDEWALKS

A. In all paved or improved streets, the surface of the trenches after having been filled and the filing has dried and settled, shall be finished without any needless delay and in the best workmanlike manner with the same kind of roadway or sidewalk improvement that was removed in excavating the trench. The underlying foundation courses, as well as the finished surface, shall conform to the undisturbed portion of the roadway or sidewalk, and shall, in every respect, be equal to the quality, materials, and workmanship. The concrete braces left in place shall then be removed and the concrete or concrete base shall be replaced as a monolith over the entire area of the cut. The replaced portion of roadway or sidewalk shall be least 24 inches wider than the width of the trench.

B. Concrete used in this work shall be 3,000 pound per square inch (minimum)strength.

C. The decision of the Engineer shall be final as to the classifying of any form of pavement or surfacing not specified in the Contract or of any forms where the classification is at all doubtful.

D. In bidding on pavement made up of two or more courses, all the courses shall be considered as integral parts of the pavement. The price bid shall be replacement of the pavement complete, including foundation, intermediate course (if present) and surface.

E. Sidewalk surfaces replaced shall, as far as possible, match the existing surface including line markings, etc.

F. As soon as the roadway or sidewalk improvement which was disturbed by the Contractor has been replaced, all refuse or surplus materials deposited or left by the Contractor on the street shall be removed therefrom and the street restored in all respects to as good a condition as before the trenching was commenced. No measurement for payment will be made of any pavement until the entire block is placed in proper condition and the above requirements complied with.

G. Should any street or sidewalk surfacing, curbs, gutters, bridges, etc., be damaged, cracked, settled, disturbed of injured in any manner by the work, such damage or injury must be replaced and the surfacing, etc., restored to its former condition by the Contractor, and the Contractor shall receive no compensation therefor except as provided for in specific pay items.

H. Should the Contractor fail or refuse to repair any such damage, the Owner may after twenty-four (24) hours written notice, employ such force and furnish such materials as may be necessary and do the work, deducting the actual cost thereof from any amounts due or to become due the Contractor.

I. Where the street has not been paved but has a hard surface composed of gravel, crushed rock, shell, etc., the Contractor shall leave the trench overfilled. When directed by the Engineers, the Contractor shall dress the backfill back to the base of the existing gravel then place the new gravel. Replacement gravel, crushed rock or shell surfaces shall be paid for by the yard of such material placed, compacted, bladed and accepted.

J. The Contractor shall be obligated to maintain and keep in good condition any replacement of base, street surfacing or sidewalks from the time of installation until final acceptance of the work.

3.22 CROSSING OF CANALS, TRACKS, ETC. – PERMITS, CHARGES, PAYMENTS

A. No additional compensation will be paid for the construction of any gas line because of its crossing under or over a drainage canal (either open or covered), a natural or artificial stream or lagoon, a railroad track or a sewer, culvert, pipe, conduit or any such structure, provided the route of the main as bid on has not been changed so as to produce a crossing not to be anticipated by the bidder. Any additional material required because of the crossing will be paid for at the prices bid for such material.

B. Special crossings for which drawings have been made and on which a special price has been added, whether a lump sum bid or otherwise, will be paid for according to the special specifications governing said crossing.

C. Such natural or artificial streams or lagoons, drainage or navigation canals, gutters or culverts, shall not be unreasonably blocked or obstructed or prevented from carrying their

customary drainage or traffic and shall be replaced by the Contractor in as good condition as they were originally, without charge.

D. The Contractor shall be responsible for any damage of any kind resulting from interference with or obstruction of any drainage canal or other waterway.

E. The Owner will secure the permits for crossing highways, railroads, canals, streams, waterways or appurtenances, but the Contractor will be held to a strict compliance with the terms under which such permits may be issued.

F. Should the highway department, railroad company, government authority or others owning or controlling the right-of-way require special supervision during construction of their premises, the cost of such supervision shall be paid for by the Contractor and no additional compensation shall be allowed.

3.23 CLEARING AND GRUBBING

A. All trees, brush, shrubs, stumps, logs and any other debris within the area indicated on the Plans for construction, shall be removed from the site and disposed of to the satisfaction of the Engineers.

B. Generally, the area shall be kept in a tidy condition and all excavations made by clearing operations shall be filled with clean dirt and compacted to a density approximately that of the adjacent undisturbed ground.

C. This cost shall be included in other items bid; no additional compensation will be allowed unless indicated otherwise on the Plans and in the Specifications.

3.24 ACCEPTANCE

A. The Contractor shall maintain his operations in a neat and orderly manner causing as little inconvenience as possible. Within 10 working days from the time a trench is opened all roadside ditches, culverts, etc., shall be repaired and surfaces thoroughly cleaned. All excess excavation shall be removed from the trench side and disposed of at the Contractor expense. The work area shall be then thoroughly cleaned.

B. Clean-up and repair shall as be approved by the Owner.

C. Final acceptance of the project will not be made until the CONTRACTOR has completed the total project and all tests, restoration, and clean-up have been performed to the satisfaction of the OWNER. All installed (as-built) valves shall be located using GPS coordinate system and data shall be provided to the Engineer prior to final acceptance.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 02615

DUCTILE IRON PIPE AND FITTINGS

PART 1 - GENERAL

1.01 SCOPE OF WORK

Furnish all labor, materials, equipment and incidentals required and install ductile iron pipe and ductile iron fittings for buried and exposed pressure piping complete as shown on the drawings and as specified herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02221: Earth Excavation and Backfill in Trenches

B. Section 02701: Water Mains

1.03 SUBMITTALS

A. The Contractor shall submit to the Engineer, within ten days after signing of the contract, a list of materials to be furnished, the names of the suppliers and the date of delivery of materials to the site.

B. The Contractor shall submit for approval, as provided in the General Conditions, complete, detailed working drawings of all ductile iron pipe and fittings.

C. The Contractor shall submit and shall comply with the recommendations of the pipe manufacturer for handling, storing, and installing pipe and fittings.

D. 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 ANSI A21.51 and AWWA C151. Thickness of pipe shall be Class 51 for 8" diameter and smaller, class 52 for 10" diameter and larger.

B. Restrained joints shall be provided for buried locations. Restrained joint pipe and fittings for 12" and smaller diameter pipe shall be "Mechanical Joint with Retainer Gland" as manufactured by American Cast Iron Pipe Company, "Lok-Tyton" or "TR FLEX" as manufactured by U.S. Pipe Company, "Super-Lock" as manufactured by Clow Corporation, or equal. Restrained joint pipe and fittings for 14" and larger

diameter pipe shall be "Lok-Fast" as manufactured by American Cast Iron Pipe Company, "Lok-Tyte" as manufactured by U.S. Pipe Company, "Super-Lock" as manufactured by Clow Corporation, or equal. Where bolts are required, they shall be stainless steel.

C. Fittings shall meet the requirements of ANSI/AWWA C110. Rubber gaskets shall conform to ANSI A21.11 for mechanical joints.

2.02 PROTECTIVE COATINGS

A. Pipe shall have a cement mortar lining on the interior in accordance with the latest revision of ANSIAWWA/104/A21.4.

B. Exterior Coating of Pipe

1. Exterior Coating of Exposed Piping: The exterior surfaces of pipe which will be exposed to the weather or above ground and not subject to immersion or corrosive gases shall be thoroughly cleaned and then given a coating of:

   a. Two (2) coats of Epoxy Polyamide and a final coat of Cycloaliphaltic Amine Epoxy conforming to the requirements of Section 09800 - Protective Coating.
   b. All surface preparation and materials shall be applied in accordance with manufacturer's instructions.

2. Exterior Coating of Exposed Piping subject to Immersion or Corrosive Gases: The exterior surfaces of pipe which will be exposed inside structures. Immersed or subject to corrosive gases shall be thoroughly cleaned and then coated with:

   a. Prime coat of Polyamidoamine Epoxy Primer and two (2) top coats of Cycloaliphatic Amine Epoxy conforming to the requirements of Section 09800 - Protective Coating.
   b. All surface preparation and materials shall be applied in accordance with manufacturer's instructions.

3. Exterior Coating of Buried Piping**:** The exterior coating shall be an asphaltic coating approximately 1-mil thick.

4. Buried Piping Polyethylene Sleeve: Sleeves shall conform to the requirements of AWWA C105, and shall be a tubular 8-mil thick linear low-density film. Color shall be black.

2.03 PIPE REJECTION

Should any Ductile or metal pipe arrive on site with a non-approved coating for its intended environment, the coating shall be completely removed and coated as per section 09800 and

section 15062 or the pipe material shall be replaced at the expense of the contractor. NO EXCEPTIONS.

2.04 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.

2.05 MANHOLE AND WET WELL CONNECTIONS

Pipe stubs for all manhole and wet well connections shall not exceed two feet (2') in length. Caps shall be furnished where required.

PART 3 - EXECUTION

3.01 LAYING DUCTILE IRON PIPE AND FITTINGS

A. All buried 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 or coatings. All pipe and fittings shall be examined before laying, and no piece shall be installed which is found to be defective. All damage to the pipe coatings shall be repaired according to the manufacturer's recommendations.

C. All pipe and fittings shall be kept clean and shall be thoroughly cleaned before lying.

D. Pipe shall be laid to lines and grades shown on the drawings with bedding and backfill as shown on the drawings and as specified in Section 02221. Blocking under the pipe will not be permitted.

E. When laying is not in progress, including lunch time, the open ends of the pipe shall be closed by watertight plug or other approved means.

F. Under no circumstances shall the pipe or accessories be dropped into the trench.

3.02 TESTING

A. All force mains shall be field tested. The Contractor shall supply all labor, equipment, material, gages, pumps, and incidentals required for testing.

B. The test pressure shall be 125 psig for water mains unless noted otherwise. The test pressure shall be 75 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 after backfilling has been completed and before placement of permanent surface.

D. Testing procedure shall be as follows:

1. Fill line slowly with water. Maintain flow velocity less than two feet (2') 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 5 psi 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 during the test.

E. Allowable leakage: No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{S\,D\,P^{1/2}}{133200}$$

L = Loss Gal/hr.
S = Length of pipe tested, in feet
D = Nominal diameter in inches
P = Average test pressure

Notes: The following shall be determined at the discretion of the Engineer.

1. Minimum Test pressure of 50 psig unless otherwise noted.
2. Test duration shall be a minimum of two hours.
3. All visible leaks are to be repaired regardless of the amount of leakage.

F. If any test of pipe laid discloses leakage greater than that allowed, the Contractor shall, at his own expense, locate and repair the cause of leakage and retest the line.

G. All visible leaks are to be repaired regardless of the amount of leakage.

3.03 CLEANING

At the conclusion of the work, the Contractor shall thoroughly clean all of the new pipelines by flushing with water or other means to remove all dirt, stones, pieces of wood, or other material which may have entered during the construction period. Debris cleaned from the lines shall be removed from the job site. If, after this cleaning, any obstructions remain, they shall be removed.

3.04 DISINFECTION AND SAMPLING

A. Pipes used in the distribution of potable water shall be cleaned and disinfected in accordance with AWWA C601 and all applicable regulatory guidelines.

B. Prior to the water main(s) being placed in service, a "clear water" sample shall be collected from the new segment(s) of water main and submitted to a LDH accredited laboratory for microbiological testing. The "clear water" sample(s) shall be collect once all pressure testing and disinfection has been completed. If the water main segment(s) failed the microbiological testing, the water main shall be flushed and disinfected. Subsequent "clear water" samples shall be collected and submitted for analysis.

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 02622

POLYVINYL CHLORIDE PIPE

PART 1 - GENERAL

1.01 DESCRIPTION

The Contractor shall furnish and install the polyvinyl chloride (PVC) pipe along with labor, materials and equipment necessary for installation in accordance with the Plans and Specifications.

1.02 REFERENCES

A. ASTM D1784 Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds

B. ASTM D1785 Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120

C. ASTM F441 Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80

D. ASTM F477 Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

E. ASTM F1674 Standard Test Method for Joint Restraint Products for Use with PVC Pipe

F. AWWA C-900 (PVC) Pressure Pipe and Fabricated Fittings

G. AWWAC-905 Polyvinyl Chloride (PVC) Water Transmission Pipe, Nominal Diameters 30" and larger for Water Transmission and Distribution

1.03 SUBMITTALS

Certified mill tests shall be furnished the Engineer by the manufacturer for all pipe and fittings at least 10 days prior to shipment of material to the job site.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Pipe:

1. All polyvinyl chloride (PVC) pipe shall be extruded from PVC meeting the requirements of cell classification 12454-B as defined in ASTM D1784.
2. All polyvinyl chloride (PVC) pressure pipe used in potable water distribution 4 inches through 30 inches in diameter shall meet AWWA specification C-900, DR18. PVC pipe larger than 30 inches in diameter shall meet AWWA specification C-905, DR25.
3. All polyvinyl chloride (PVC) pipe used to transport raw sewage, treated sewage, sludge, etc., by gravity shall be SDR 26 PVC pipe. Polyvinyl chloride (PVC) pipe in diameters of 16 inches through 36 inches shall meet all requirements of ASTM F1674 latest revision or approved equal.
4. All polyvinyl chloride (PVC) pipe used to transport raw sewage, treated sewage, sludge, etc., under pressure shall be SDR 26 for diameters up to and including 36 inches. The pipe shall have a minimum pressure rating of 160 psi, and compatible for use with ductile iron joints and fittings.

B. Fitting and Specials:

1. The polyvinyl chloride fitting used in conjunction with Schedule 80 and SDR 26 polyvinyl chloride (PVC) pipe shall be in accordance with all applicable sections of ASTM Specifications.
2. PVC fittings in chlorine solution service shall be Schedule 80, suitable for outdoor installation.
3. The strength class of the fitting shall be not less than the strength of any adjoining pipe.
4. No polyvinyl chloride (PVC) pipe fitting will be allowed on PVC pipe used to transport raw sewage, treated sewage, sludge, etc., under pressure. All bends shall be ductile iron fittings meeting the requirements of Section 02615.

C. Joints:

1. The pipe will have integral bell elastomeric, gasketed joints in accordance with ASTM F477. The gaskets shall be inserted into the pipe bell at the factory prior to shipment.
2. All "O" rings furnished as part of any fitting, union, etc., conveying chloride solution shall be suitable for chlorine solution service.

D. Protective Coatings: No protective coating will be required on polyvinyl chloride (PVC) pipe.

E. Restrained Joints:

1. Polyvinyl chloride (PVC) pipe shall be restrained using the Series 1100 PV or 1100 HV MEGALUG mechanical joint thrust restraint as manufactured by EBAA Iron, Inc. or approved equal.
2. The EBAA Iron Series 1100 PV or 1100 HV MEGALUG assembly shall be cast completely of closely controlled ductile iron conforming to ASTM A536, latest

revision, and furnished with silicone bronze IFI 140 Grade 655 bolts. All glands and bolts shall be coated with two (2) coats of coal tar epoxy, Koppers 300-M Bitumastic or approved equal, with a minimum dry film thickness of eight (8) mils per coat.

3. Both types of restraining glands shall be wrapped with an eight (8) mil thick polyethylene tube for additional protection. The polyethylene wrap shall extend a minimum of two (2') feet in either direction from the gland and secured on the end with circumferential turns of tape.
4. All restrained joints shall be inspected at the job site after installation. Field touch-up and repair if needed shall be made by the Contractor under the supervision and inspection of a representative of the coating supplier.

PART 3 - EXECUTION

3.01 LAYING PIPE AND FITTINGS

A. All buried 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 or coatings. All pipe and fittings shall be examined before laying, and no piece shall be installed which is found to be defective. All damage to the pipe coatings shall be repaired according to the manufacturer's recommendations.

C. All pipe and fittings shall be kept clean and shall be thoroughly cleaned before lying.

D. Pipe shall be laid to lines and grades shown on the drawings with bedding and backfill as shown on the drawings and as specified in Section 02221. Blocking under the pipe will not be permitted.

E. When laying is not in progress, including lunch time, the open ends of the pipe shall be closed by watertight plug or other approved means.

F. Under no circumstances shall the pipe or accessories be dropped into the trench.

3.02 TESTING AND INSPECTION

A. All pipe and fittings shall be subjected to a rigid inspection after delivery to the site and before being placed in the work. Any piece found defective by such field inspection will be rejected and shall be immediately removed from the premises.

B. The test pressure shall be 125 psig for water mains unless noted otherwise. The test pressure shall be 75 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 after backfilling has been completed and before placement of permanent surface.

D. Testing procedure shall be as follows:

1. Fill line slowly with water. Maintain flow velocity less than two feet (2') 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 5 psi 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 during the test.

E. Allowable leakage: No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{S\,D\,P^{1/2}}{133200}$$

L = Loss Gal/hr.
S = Length of pipe tested, in feet
D = Nominal diameter in inches
P = Average test pressure

Notes: The following shall be determined at the discretion of the Engineer.

1. Minimum Test pressure of 75 psig for sewer force mains and 125 psig for water mains unless otherwise noted.
2. Test duration shall be a minimum of two hours.
3. All visible leaks are to be repaired regardless of the amount of leakage.

F. If any test of pipe laid discloses leakage greater than that allowed, the Contractor shall, at his own expense, locate and repair the cause of leakage and retest the line.

G. All visible leaks are to be repaired regardless of the amount of leakage.

H. The alignment of gravity sewer mains shall be field verified by deflection (mandrel) test and lamping the lines. The contractor at his own expense shall re-lay all gravity sewer lines determined to be out of alignment by deflection testing. Damaged pipe shall not be repaired or re-used. All re-laid gravity mains shall be re-inspected and re-checked for alignment.

I. Water tightness of the gravity sewer system, including the gravity sewer mains, shall be field verified by exfiltration testing. The volume of water lost during exfiltration testing

shall not exceed 200 gallons per day – per inch of pipe diameter – per mile of pipe.

3.03 CLEANING

At the conclusion of the work, the Contractor shall thoroughly clean all of the new pipelines by flushing with water or other means to remove all dirt, stones, pieces of wood, or other material which may have entered during the construction period. Debris cleaned from the lines shall be removed from the job site. If, after this cleaning, any obstructions remain, they shall be removed.

3.04 DISINFECTION AND SAMPLING

A. Pipes used in the distribution of potable water shall be cleaned and disinfected in accordance with AWWA C601 and all applicable regulatory guidelines.

B. Prior to the water main(s) being placed in service, a "clear water" sample shall be collected from the new segment(s) of water main and submitted to a LDH accredited laboratory for microbiological testing. The "clear water" sample(s) shall be collect once all pressure testing and disinfection has been completed. If the water main segment(s) failed the microbiological testing, the water main shall be flushed and disinfected. A subsequent "clear water" sample shall be collected and submitted for analysis.

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 02658

CONNECTION TO AND WORK ON THE EXISTING SYSTEM

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall coordinate with the Department of Utilities prior to connecting to existing sewer and/or water systems. The Contractor shall contact Tammany Utilities at (985) 893-1717 to schedule connection inspection.

B. The Contractor shall supply all materials, equipment and labor required to maintain pressure and flow in existing sewer and/or water system, and maintain all temporary connections and bypasses and construct the permanent connections to the new system as shown on the Drawings and as directed by the Engineer.

C. The Contractor shall supply all materials, equipment and labor required for installing all piping, valves, and pipelines and all incidental work required.

D. Should damage of any kind occur to the existing sewer system, the Contractor shall at his/her own expense, as part of the work under this Item, make repairs to the satisfaction of the Engineer.

E. The Contractor shall notify the Engineer immediately of any discrepancies in elevations of existing valves, and pipelines between those shown on the Drawings and those established during construction in order that the Engineer can make the necessary modifications..

F. Each tie-in shall be done within 4 continuous hours with prior approval. Tie-in (s) may be required at low flow and at different times of the day, depending on the general operations of the facilities.

1.02 RELATED WORK

A. Section 02220 - Excavation, Backfill, Fill and Grading For Structures

B. Section 02221 - Earth Excavation and Backfill In Trenches

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 02900

LANDSCAPING

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, and equipment to satisfactorily return all construction areas to their original conditions or better.

B. Work includes furnishing and placing fertilizer, planting, watering, and maintenance of lawns.

C. Seeding of disturbed areas shall be allowed along undeveloped areas of the pipeline installation. Sodding will be required for any established lawns in developed areas. The type of restoration required for any individual area shall be mutually agreed upon by Contractor and Engineer prior to construction.

D. Restoration of landscaping shall be included in the prices for unit pipe of the various types and sizes.

1.02 RELATED WORK NOT INCLUDED

A. Excavation, filling, and grading required to establish elevation shown on the drawings are included under other sections of these specifications.

B. Section 01380: Construction Photographs and videos.

1.03 QUALITY ASSURANCE

A. Requirements - It is the intent of this specification that the Contractor is obliged to deliver a satisfactory stand of perennial grass as specified. If necessary, the Contractor shall repeat any or all of the work, including plowing, fertilizing, watering, seeding or sodding at no additional cost to the Owner until a satisfactory stand is obtained.

B. Satisfactory Stand - For purposes of grassing, a satisfactory stand of grass is herein defined as a full lawn cover over areas to be seeded or sodded, with grass free of weeds, alive and growing, leaving no bare spots larger than 3/4 square yard within a radius of 10 feet.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Fertilizer, slow-release type meeting the following minimum requirements: 12% nitrogen, 3% phosphorus, 6% potassium, 40% other available materials derived from organic sources. Fertilizer shall be uniform in composition, dry and free flowing delivered to sites in original unopened containers bearing manufacturer's statement or guarantee.

B. Grass sod shall be of the same type grass as existed prior to construction. Sod shall be live nursery quality sod blocks measuring at least 9 inches square. The sod shall be of a thickness that will provide a soil binder with a root system that will enhance growth of the grass and provide a thick, healthy grass cover.

C. Grass seed shall be the same as existed prior to construction or as approved by the Engineer and shall be 99% minimum purity, 80% minimum germination, and 1% maximum weed seed, labeled in accordance with U.S. Department of Agriculture Rules and Regulations under Federal Seed Act in effect. Seed which has become wet, moldy, or otherwise damaged in transit or storage shall not be acceptable.

D. Topsoil stockpiled during excavation shall be used. If additional topsoil is required, it shall be obtained off site. Topsoil shall be fertile, natural surface soil, capable of producing all trees, plants, and grassing specified herein.

E. Mulch shall be fresh pine mulch. Rate of application specified herein shall correspond to depth not less than 1" or more than 3" according to texture and moisture content of mulch material.

F. Water: It is the Contractor's responsibility to supply all water to the site, as required during planting operations and through the maintenance period and until the work is accepted. The Contractor shall make whatever arrangements may be necessary to ensure an adequate supply of water to meet the needs for his work. He shall also furnish all necessary hose, equipment, attachments, and accessories for the adequate irrigation of lawns, and planted areas as may be required. Water shall be suitable for irrigation and free from ingredients harmful to plant life.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Time of Planting: When the trench backfill has compacted sufficiently, the Contractor shall commence work on lawns, including fine grading as required.

B. Soil Placement: Lawn areas shall be plowed to a depth of 6" depressions filled, sticks, and rubbish removed. Following subgrade preparation top soil shall be spaced evenly 6" thick over all lawn and planting areas; prepare surface by raking or other means so as to establish smooth lawn. Apply 20 lbs. of 12-3-6 fertilizer per 1000 sq. ft.

C. Finish Grading: Areas to be seeded or sodded shall be finished graded, raked, and debris removed. Soft spots and uneven grades shall be eliminated; all slopes of 4 to 1 or greater shall be mulched. Seed and/or sod shall be sown or layed within 24 hours following application of fertilizer.

D. Grassing:

1. Grassing shall be seeded uniformly at a rate of 10 lbs. to 1000 sq. ft. of area, or as recommended, by use of rotary hand seeders, power sprayers, or other satisfactory equipment, lightly raked, compacted, and watered using fine spray. Seeded areas shall be protected against traffic or other use by placing warning signs or erecting barricades as necessary. Thirty (30) days after seeding, fertilize with 10 lbs. of Seed and Sod 18-24-10 fertilizer per 2500 sq. ft. of lawn area. Protect seeded areas against erosion by spreading straw to be uniform loose depth of 1-1/2 inches, if applied by hand seeders or hydro mulch if applied by hydro-seeding.
2. Sod shall be installed by laying a solid mat of sod blocks where necessary. The sod blocks shall be broken up to "chink" holes left due to mismatched sod blocks or to cover irregular areas.
3. Preparation of Subgrade. Unless otherwise specified, subsoil shall be graded and uniformly compacted so that it will be parallel to proposed finished grade.

E. Landscaping: Install trees and shrubs when authorized by the Owner and/or Engineer.

3.02 CLEANUP

Soil, mulch, or similar materials brought onto paved areas shall be removed promptly, keeping these areas as clean as possible at all times. Upon completion of planting operations, all excess soil, stones, and debris remaining shall be removed from the construction areas.

3.03 LANDSCAPE MAINTENANCE

Maintain landscape work for a period of 90 days immediately following complete installation of work or until Owner accepts the project. Include watering, weeding, cultivating, restoration of grade, mowing and trimming grass, protection from insects and diseases, fertilizing and similar operations as needed to ensure normal growth and good health for live plant material.

3.04 REPAIRS TO LAWN AREAS DISTURBED BY CONTRACTOR'S OPERATIONS

Lawn areas planted under this contract and all lawn areas damaged by the Contractor's operation shall be repaired at once by proper soil preparation, fertilizing, and reseeding or sodding, in accordance with these specifications.

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 02951
WASTEWATER STRUCTURES REHABILITATION (MANHOLES)

PART I - GENERAL

1.01 DESCRIPTION

The work described within details a complete program for wastewater structures. The completed system will provide a corrosion resistant liner to rehabilitate deteriorated structures and prevent further deterioration from hydrogen sulfide and other corrosive gases/acids within the wastewater stream.

1.02 REFERENCES

A. ASTM D7234 – Adhesion
B. ASTM D412 – Tensile Strength (PSI)
C. ASTM D412 – Elongation (%)
D. ASTM D624 – Tear Strength (PLI)
E. ASTM D2240 – Hardness
F. ASTM D522 – Flexibility (1/8" mandrel)
G. ASTM D4060 – Taber Abrasion (mg loss)

1.03 SUBMITTALS

All materials and procedures required to establish compliance with the specifications shall be submitted to the owner/engineer for review/approval. Submittals shall include at least the following:

1. Descriptive literature, bulletins and or catalogs of materials.
2. Work procedures including flow diversion plan, method of repair, etc.
3. Material and method for repair of leaks or cracks in concrete structures.
4. Final installation report on completed structures.
5. ASTM references
6. Material safety data sheet (MSDS) for each product used
7. Technical data sheet for each product used

1.04 10-YEAR LIMITED WARRANTY

The supplied lining system shall include a **10-year limited warranty** covering both materials AND installation beginning on the date of final acceptance.

1.05 QUALITY ASSURANCE

A. The manufacturer and/or installer of the total liner system of concrete structures shall be a company that specializes in the design, manufacture or installation of corrosion protection systems for concrete structures including wet wells, junction chambers, etc. Installer shall

be completely trained in leak repair, surface preparation and corrosion materials application on concrete structures. Corrosion materials/products shall be suitable for installation in a severe hydrogen sulfide environment without any deterioration to the liner and shall completely prevent the breakdown of concrete surfaces. Materials specified are those that have been evaluated for the specific service.

B. To ensure total unit responsibility, all materials and installation thereof shall be furnished and coordinated with/by one supplier/installer who turnkeys the work and assumes full responsibility for the entire operation.

C. Alternative lining systems will be considered. Requests for substitutions shall include the manufacturer's descriptive literature for each product, giving name, product number, and generic type, manufacturer's recommended application procedure, required testing lab results, and other information as deemed necessary by the engineer to determine the suitability of the substitute. Pre-approval requests must be submitted no later than 7-days prior to bid. For consideration, alternate lining systems shall be comprised of a multi-component stress-skin panel lining system providing a **minimum** of 500 mils of completely inert polymer lining. Products requiring cementitious underlayments/resurfacers will not be considered, unless the inert polymer lining thickness is **500 mils or greater**. All alternative multi-component polymer lining systems shall also provide a record of experience showing no less than 10-years of experience lining large sewer collection and treatment structures.

PART II - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. The materials to be utilized in the lining of concrete structures shall be designed and manufactured to withstand the severe effects of hydrogen sulfide in a wastewater environment. Manufacturer of corrosion protection products shall have long proven experience in the production of the coating products utilized and shall have satisfactory installation record.

B. Abrasive blasting equipment or high pressure (>35,000psi) hydro blasting shall be suited to completely remove deteriorated concrete and hard contaminants from the existing concrete surfaces. Containment unit to capture spent abrasive material shall be provided unless otherwise approved by the owner/engineer.

C. Equipment for installation of lining materials shall be high quality grade and be as recommended by the manufacturer.

D. The lining system to be utilized for concrete structures shall be a multi-component stress panel liner system as described below and as manufactured by CCI Spectrum, Inc. Spectrashield Liner Systems, Jacksonville, FL (904) 419-4889 or approved equal.

1. Liner.

Installation	Liner
Moisture displacement barrier	Primer
Moisture barrier	Modified Polymer
Surfacer	Polyurethane/Polymeric blend
Final corrosion barrier	Modified polymer

2. Primer shall be 100% solids

3. Modified polymer shall be sprayable, solvent free, two-component polymeric, moisture/ chemical barrier specifically developed for the corrosive wastewater environment.

TYPICAL CHEMICAL ANALYSIS

"A" Component

Viscosity, 77° F, cps., ASTM D-1638	300-400
Physical State	Liquid
Color	Clear to amber
Hygroscopicity	Reacts with water

"B" Component

Viscosity, 160° F, cps., ASTM D-1638	400-600
Physical State	Liquid
Color	Flamingo Pink
Non-Volatile	100%

REACTION PROFILE (100 grams, 175° F sample)

Gel Time, seconds	1-2
Tack Free Time, seconds	15
Cure Time, seconds	30

PROCESSING

A System / B System, volume ratio	1.00 / 1.00

TYPICAL PHYSICAL PROPERTIES

Tensile Strength (PSI)	ASTM D412	4280	
Elongation (%)	ASTM D412	200	
100% Modulus	ASTM D412	2200	
300 % Modulus	ASTM D412	2600	
Tear Strength (PLI)	ASTM D2240	350	
Hardness (shore D)	ASTM D1737	60D	
Flexibility (1/ 8 "Mandrel)	ASTM D1737	Pass	
Flashpoint (°F)	ASTM Pensky-Martin		>200
Taber Abrasion (mg loss)	ASTM D4060	52	

4. Polyurethane Rigid Structure- low viscosity two-component containing flame retardants

TYPICAL CHEMICAL ANALYSIS

"A" Component

Viscosity, 77° F, cps., ASTM D-1638	200
Physical State	Liquid
Color	Dark Brown
Hygroscopicity	Reacts with water and evolves CO2 gas

"B" Component

Viscosity, 77° F, cps., ASTM D-1638	600-1000
Physical State	Liquid
Color	Tan
Hygroscopicity	Absorbs water rapidly thus changing ratio

Reaction Profile (100 grams, 77° F sample)

Cream Time, seconds	1-4
Tack Free time, seconds	5-8
Rise Time, seconds	6-10

Processing

A System / B System, volume ratio	1.00 / 1.00

5. Total thickness of multi-component stress panel liner shall be a **minimum of 500 mils**.

PART III – EXECUTION

3.01 INSPECTION

Prior to conducting any work, perform inspection of structure to determine need for protection against hazardous gases or oxygen depleted atmosphere and the need for flow control or flow diversion. Submit plan for flow control or bypass to owner/engineer for approval prior to conducting the work. Work shall not proceed until flow control or bypass plan is approved by Owner.

3.02 SURFACE PREPARATION

A. Conduct surface preparation program to include monitoring of atmosphere for hydrogen

sulfide, methane, low oxygen or other gases, approved flow control equipment, and abrasive blasting equipment.

B. Hydro blasting (min 35,000 p.s.i) or abrasive blasting equipment shall remove all deteriorated concrete, hard contaminants, localized micro- organisms and gas contaminants, from the concrete walls, floors or other structures. Final product shall be cleaned, exposed and virgin concrete aggregate ready for rehabilitation material.

C. After completion of surface preparation, blasting phase, perform the seven point check list, which is the inspection for:

1. Leaks
2. Cracks
3. Holes
4. Exposed Rebar
5. Ring and Cover condition
6. Invert Condition
7. Inlet and Outlet Pipe Condition

D. After the defects in the structure are identified, repair all leaks with a chemical or hydraulic sealant designed for use in field sealing of ground water. Severe cracks shall be "repaired with a urethane based chemical" sealant. Product to be utilizes shall be as approved by owner/engineer prior to installation. Repairs to exposed rebar, defective pipe penetrations or inverts, etc. shall be repaired utilizing non-shrink grout or approved alternative method.

E. Prior to application of final liner application, if required, re-blast the entire structure and remove all abrasive materials.

3.03 MATERIAL INSTALLATION

A. The limits of the corrosion protection system shall be all exposed concrete/brick surfaces including walls, tap sections, risers, etc; unless otherwise directed by the owner/engineer.

B. Application of multi-component system shall be in strict accordance with manufacturers recommendation. Final installation shall be a minimum of 500 mils. A permanent identification number and date of work performed shall be affixed to the structure in a readily visible location.

C. Provide final written report to owner/engineer detailing the location, date of report, and description of repair.

3.04 INSPECTION

Final concrete/brick structure corrosion protection system shall be completely free of pinholes or voids. Entire exposed concrete/brick surface shall be protected with corrosion protection system. Liner thickness shall be the minimum value as described here.

3.05 REPAIR OF DEFECTS

All defects identified during inspection such as pinholes, low film millage, etc. shall be repaired with same material.

THIS PAGE IS INTENTIONALLY BLANK

SECTION 02975

TEMPORARY SEWER BYPASS PUMPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes

1. Temporary bypass pumping for daily system shutdowns of sewer systems.
2. Temporary bypass pumping for overnight or extended shutdowns of sewer systems.
3. Temporary bypass pumping for decommissioning of the wastewater treatment plant

1.02 REFERENCES

A. Abbreviations and Acronyms
   1. SSO Sanitary Sewer Overflow

B. Definitions
   1. Daily System Shutdowns: System gravity flows shall be restored daily before the end of regular work hours.
   2. Firm Capacity: The pumping capacity of a temporary bypass pumping system with the largest pump out of service.

1.03 ADMINISTRATIVE REQUIREMENTS (BYPASS / FLOW CONTROL PLAN)

A. Coordination
   1. Coordinate temporary bypass pumping system testing with Engineer and Owner. Provide a minimum of three business days' notice prior to system testing. Engineer or Owner representative must observe testing for it to be accepted.
   2. Coordinate system shutdowns with Engineer and Owner.

B. Sequencing
   1. Operate temporary bypass pumping systems in accordance with the sequencing and phasing indicated on the Drawings.

C. Scheduling
   1. The Project Schedule shall include the sequencing and coordination of maintaining wastewater flow during all phases of construction including but not limited to:
      a. Sewer pump station upgrades and replacements
      b. Trenchless rehabilitation of sewer and force mains
      c. Inspection and testing of new or rehabilitated sewers

d. Connections to existing sewer mains and force mains

1.04 SUBMITTALS

A. Provide in accordance with Section 01340 – Submittals.
   1. Temporary Bypass Pumping Plans designated by type and location.
   2. System test results and operation logs.
   3. Obtain Engineer and Owner approval of submittals prior to mobilization of equipment included in the plans.

B. Temporary Bypass Pumping Plan – For Daily System Shutdowns
   1. Outline provisions and precautions to be taken to convey and maintain existing wastewater flows during construction.
   2. Ensure proper protection of existing facilities, the project area, and surrounding properties from damage due to the discharge of flows.
   3. Provide adequate standby equipment available and ready for immediate operation and use in the event of an emergency or breakdown. One standby pump for each size pump utilized shall be located at the mainline flow bypassing locations, ready for use in the event of primary pump failure. In this event, promptly repair or replace the failed equipment.
   4. Include the following as a minimum:
      a. Manufacturer's product data for bypass pumps including sizes, capacities, power requirements, and number of each size to be on site including primary, secondary, and spare pumps.
      b. Manufacturer's product data for bypass piping including make, material, material properties, diameter, thickness, pressure rating, and number to be on site.
      c. Calculations to demonstrate sufficient pump capacity for potential flows.
      d. Method of noise control for pumps, motors, and generators.
      e. Location and method of connection to the existing sewer on each side of the bypass if not provided in the Contract Documents.
      f. Number, size, material, and method of installation of suction and discharge piping, valves (isolation and air release), fittings, and other components for connection to the existing sewer system.
      g. Sewer isolation or plugging method and types of plugs or valves and fittings.
      h. Emergency plan for adverse weather and flooding for various phases of the Work.
      i. Incidental items required to ensure proper protection of the facilities.
      j. Traffic Control Plan where roads are impacted.
      k. Plan to divert pedestrian access where sidewalks are impacted.

C. Temporary Bypass Pumping Plan – For System Shutdowns Overnight or for Extended Periods
   1. Prepare and submit a project- and site-specific detailed temporary bypass pumping plan that provides detailed descriptions and layout drawings of the

proposed temporary bypass pumping system(s). Outline provisions and precautions to be taken by the Contractor to convey and maintain existing wastewater flows during construction.

2. Ensure proper protection of existing facilities, the project area, and surrounding properties from damage due to the discharge of flows.
3. Include the following as a minimum:
   a. Size of pipeline or conveyance system to be bypassed.
   b. Staging areas for pumps.
   c. Manufacturer's product data for temporary bypass pump sizes, capacities, power requirements, and number of each size to be on site including primary, secondary, and spare pumps. Provide method of operation and control, and redundancy sufficient to prevent SSOs.
   d. Provisions for standby power including generator size and location.
   e. Provisions for stand-by lighting.
   f. Method of noise control for pumps, motors, or generators.
   g. Location and method of connection to the existing sewer on each side of the bypass if not provided in the Contract Documents.
   h. Size and location of manholes or access points for suction and discharge hose or piping.
   i. Plan indicating location of temporary bypass pumping pipe locations.
   j. Number, size, material, location, and method of installation of suction and discharge piping, valves (isolation and air release), fittings, and connections to the existing sewer system.
   k. For buried piping, typical sections showing suction and discharge pipe depth, embedment, select fill and special backfill.
   l. Thrust and restraint block sizes and locations. Provide details necessary to demonstrate the integrity of restraint of suction and discharge piping including piping and fittings associated with primary and secondary pumping units.
   m. Sewer isolation or plugging method and types of plugs or valves and fittings.
   n. Discharge plan including method of protecting discharge manholes or structures from erosion and other damage.
   o. Access plans to temporary bypass pumping locations indicated on the drawings.
   p. Heavy equipment required for installation of pumps, piping, valves, fittings, and other materials.
   q. Temporary pipe supports and anchoring.
   r. Calculations of static lift, friction losses, and flow velocity (pump curves showing pump operating range shall be submitted).
   s. Calculations for selection of temporary bypass pumping pipe size.
   t. Schedule for installation, operation, maintenance, and removal of the temporary bypass pumping system(s).
   u. Emergency plan for adverse weather and flooding for various phases of the Work.

v. Contractor's plan for providing continuous (24-hour) monitoring of the temporary bypass pumping operation as well as the monitoring persons' qualifications. Additionally, an auto-dialer alarm system shall be provided for loss of primary pump or high level at suction location.
w. Plan for refueling pump sets on demand.
x. Demonstration of compliance with the requirements and permit conditions specified in the Contract Documents.
y. Incidental items necessary to insure proper protection of the facilities.

1.05 QUALITY ASSURANCE

A. Demonstrate, or employ the services of a subcontractor, who can demonstrate that they specialize in the design and operation of temporary sewer bypass pumping systems.

B. Comply with OSHA Standards, Underwriter Laboratories, and other authorities having jurisdiction. The temporary bypass pumping system shall meet the requirements of codes and regulatory agencies having jurisdiction.

C. Materials and appurtenances shall be clearly, legibly, and appropriately marked for identification purposes. Marking shall include listing/approval stamp, label, or other marking indicating conformance with specified standards.

D. Perform temporary bypass pumping system testing in accordance with Part 3.

PART 2 - PRODUCTS

2.01 TEMPORARY SEWER BYPASS PUMPING SYSTEMS FOR SYSTEM SHUTDOWNS EXTENDING OVERNIGHT

A. Pumps shall be fully automatic self-priming units that do not require the use of foot valves or vacuum pumps in the priming system. Pumps may be electric, or diesel powered. Diesel powered pumps shall include critical grade silencing (25 decibels max.) when used in residential settings or areas where excessive noise levels would create a disturbance.

B. Provide level detection equipment, alarms, drives, controls, fittings, valves, air release valves, fuel tanks, auxiliary fuel tanks, and other components for a reliable stand-alone system. Provide sufficient components for a redundant system.

C. Include 100 percent on-line pumping redundancy. Include a redundant bypass pump, intake and discharge conduit, and other equipment necessary to provide continuous wastewater flow and prevent the backing up of sewage in the event of primary system failure.

2.02 PERFORMANCE REQUIREMENTS

A. Design, install, operate, and maintain a temporary bypass pumping system to maintain continuous wastewater service to customers of CFPUA. The Contractor shall be responsible for bypass pumping of wastewater as required to prevent backing up of sewage (except as approved by CFPUA) and provide appropriate conditions for proper drainage, inspection, replacement, rehabilitation, testing or reconnections to existing sewers.

B. Operations
   1. Operators
      a. Provide on-site manual oversight by a responsible operator of temporary bypass pumping operations 24 hours per day, 7 days per week when the temporary bypass pumping systems are in operation.
      b. The 24-hour monitoring operator shall be properly trained, experienced, and mechanically qualified so that they can quickly and effectively address potential emergency and non-emergency situations associated with the pumps and temporary bypass pumping system.
   2. Controls
      a. Pumps shall operate on redundant control systems and be equipped with an auto-dialer, cellular, or SCADA monitoring and control. Controls shall be set so that the systems do not surcharge and create an SSO in upstream manholes or a backup of wastewater into residential or commercial facilities.
   3. Operation Sequences
      a. Comply with operating sequences provided by Engineer and Owner.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Inspect Work area and verify that existing conditions match the conditions depicted on the Drawings. Notify Engineer immediately of any discrepancies.

B. System Testing

   1. Perform leakage and pressure tests of the temporary bypass pumping discharge piping using clean water prior to operation. Pressure and leakage tests shall be conducted at 1.5 times the maximum working pressure, based on the approved Temporary Bypass Pumping Plan, for a period of two hours. No leakage is permitted during this test. Provide a leakage and pressure test report that documents start time and pressure, pressure at 15-minute intervals, stop time, end of test pressure, and amount of leakage. Report shall be signed by the Contractor's on-site superintendent and project manager, and the Engineer or Owner representative.

2. Demonstrate that the temporary bypass pumping system is in good working order and is sufficiently sized to successfully convey wastewater flows by operating the system in automatic mode for a period of 24 hours prior to beginning Work.

3. Demonstrate alarms function as designed.

4. Demonstrate back-up pumps and systems operate as designed.

3.02 PREPARATION

A. Temporary bypass pumping operations shall not proceed until submittals have been approved.

B. Do not interrupt sewer service without prior approval of Owner.

C. Precautions
   1. Locate existing utilities in proximity to the temporary bypass pumping system. Install temporary bypass pumping system components to minimize disturbance to existing utilities and in accordance with the Temporary Bypass Pumping System Plan. Costs associated with relocating existing utilities and obtaining approvals shall be borne by the Contractor.
   2. During temporary bypass pumping system operation, protect the existing sanitary sewer facilities from damage inflicted by any equipment. The Contractor shall be responsible for physical damage to the existing sanitary sewer facilities caused by human or mechanical failure.

3.03 INSTALLATION

A. General
   1. Prevent damage to existing structures. Discharge piping to gravity sewer systems shall be designed in such a manner as to prevent discharge from contacting manhole walls or benching. Full discharge shall go into the downstream pipe in a manner to minimize turbulence. It may be necessary to remove manhole cones to provide sufficient space for the bypass piping. Contractor is responsible for any damage to manholes. Repair damaged manholes to preconstruction condition.
   2. Make connections to the existing sewer and construct temporary bypass pumping structures only at the access locations indicated on the Drawings.
   3. The new sewer may be used by the Contractor to convey the sanitary flows after the new sewer has passed inspection and testing. Owner shall approve any temporary connections to the new sewer.
   4. Plugging or blocking of sewage flows shall incorporate a primary and secondary plugging device. When plugging or blocking is no longer needed for performance and acceptance of work, it is to be removed in a manner that permits the sewage flow to slowly return to normal without surge and that prevents surcharging or causing other major disturbances downstream.

5. When working inside a manhole or force main in the presence of sewer gases, combustible or oxygen-deficient atmospheres, and confined spaces, the Contractor shall exercise caution and comply with OSHA requirements.
6. Installation of bypass pipelines is prohibited in wetland areas. The pipeline must be located off streets (except where streets are shut down and detours or lane shifts are provided) and sidewalks and on shoulders of the roads or within easements. When the bypass pipeline crosses local streets and private driveways, install temporary road ramps.

B. Steel Pipe shall be installed in accordance with manufacturer recommendations. Locking pins shall be placed in couplings.

C. HDPE pipe shall be installed in accordance with AWWA M55 "PE Pipe – Design and Installation" and the "Handbook of Polyethylene Pipe" by the Plastics Pipe Institute. The pipe shall be joined by the butt fusion procedure outlined in ASTM F 2620 or PPI TR-33. Fusion joints shall be made in compliance with the pipe or fitting manufacturer's recommendations. Fusion joints shall be made by qualified fusion technicians per PPI TN-42.

3.04 OPERATION

A. Maintain flows in the existing upstream pumps stations, sewer interceptors, and tributary collector and lateral lines at all times and under all weather conditions except for brief periods when mains and services are disconnected and reconnected. Take actions and precautions necessary to prevent discharge of wastewater during disconnection and reconnection of mains including performing those tasks during off peak hours or providing additional temporary bypass measures. Interruption of flows that result in the discharge of wastewater will not be permitted.

B. Maintain sewer flow at the work area in a manner that will not cause surcharging of sewers or damage to sewers, and that will protect public and private property from damage and flooding.

C. Anticipate severe weather conditions and increases in peak flows during rain events and design and plan for these accordingly.

D. Immediately notify Owner should a sanitary sewer overflow (SSO) occur. Take necessary action to clean up and disinfect the spillage to the satisfaction of Owner and other governmental agencies with jurisdiction. If sewage is spilled onto public or private property, wash down, clean up, and disinfect the spillage to the satisfaction of the property owner, utility owner, and governmental regulatory agencies.

E. Overflows from temporary bypass operations shall not be permitted to enter streams or bodies of water. The Contractor shall be solely responsible for paying fines imposed and legal actions taken by state and federal regulatory agencies if overflows occur as a result of the temporary bypass pumping operations. Reimburse Owner for any

damages, operational costs, fines, and other effects. Immediately remove and dispose of wastewater and waste material spilled during the temporary bypass pumping at his own expense.

F. Make every effort to avoid causing unplanned service outages. Owner will investigate service outages resulting from Contractor's operations. If the investigation determines that the Contractor could have avoided the service outage, then the outage shall result in disciplinary actions including but not limited to reimbursement to the Owner for any damages, operational costs, fines, and other effects.

G. Provide pipeline plugs, temporary suction piping, pumps of adequate size to handle peak flow, and temporary discharge piping to ensure that the total flow of the sewer main can be safely diverted around the section of sewer designated for rehabilitation. Do not stop or impede the main flows without prior approval by Owner.

H. Temporary bypass pumping systems for system shutdowns extending overnight shall be operated 24 hours per day.

I. Where portions of the Work require that tributary pump stations be taken out of service for prolonged periods, the Contractor shall construct a temporary bypass pumping system for those pump stations that discharge into either the existing piping downstream of the affected area, or to a neighboring gravity sewer (as identified by Owner) that flows to an unaffected pump station.

J. Temporary road ramps shall be used where necessary to maintain traffic flow.

K. Cease bypass pumping operations and return flows to the new or existing sewer when directed by Owner.

L. Contractor shall repair, at his own expense, any damage to public or private property caused by his operations.

M. A copy of the Owner approved Temporary Bypass Pumping Plan shall be available onsite at all times during temporary bypass pumping operations.

3.05 MONITORING

A. Operators shall perform inspections of the temporary bypass pumping system and operation at a minimum of hourly intervals. Inspections shall include at a minimum:
   1. Observation of all components of the temporary bypass system, including all piping and appurtenances, to ensure the system is operating as specified and no leakage or damage is occurring.
   2. Observation of the suction and discharge locations of the temporary bypass pumping system, including upstream and downstream sewers, to ensure flow levels are as expected and no surcharging of the sewer or damage is occurring.
   3. Verification of adequate fuel supply.

B. Inspections shall be documented in the operation log at the time that the inspection is

performed.

3.06 PROTECTION

A. Protect temporary bypass pumping systems from traffic in proximity to system components and vandalism. Repair or replace damaged components immediately.

3.07 MAINTENANCE

A. Ensure that the temporary bypass pumping system is properly maintained in accordance with the Temporary Bypass Pumping Plan and manufacturer recommendations. There shall be no leakage from the temporary bypass pumping system.

B. Sufficient spare parts for pumps and piping shall be kept on site to maintain operation of the redundant system. Immediately replace spare parts that are placed into service.

3.08 DISASSEMBLY AND REMOVAL

A. When bypass operations are complete, bypass piping shall be flushed with fresh water and drained into the wastewater system prior to disassembly. Piping shall be disassembled in a manner to prevent an SSO.

B. Upon completion of the bypass pumping operations, and after the receipt of written permission from Owner, the Contractor shall disassemble and remove piping and restore property to pre-construction condition.

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 02999

MISCELLANEOUS WORK AND CLEANUP

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. This section includes operations which cannot be specified in detail as separate items but can be sufficiently described as to the kind and extent of work involved. The Contractor shall furnish all labor, materials, equipment and incidentals to complete the work under this section.

B. The work of the section includes, but is not limited to, the following:

1. Restoring of fences and guard rails
2. Crossing utilities
3. Restoring easements (servitudes) and rights-of-way
4. Cleaning up
5. Incidental work

1.02 WORK SPECIFIED UNDER OTHER SECTIONS

All work shall be completed in a workmanlike manner by competent workmen in full compliance with all applicable sections of these specifications.

PART 2 - PRODUCTS

2.01 MATERIALS

Materials required for this section shall be of at least the same type and quality as materials which are to be restored. Where possible, the Contractor shall reuse existing materials which are removed and then replaced, with the exception of paving.

PART 3 - EXECUTION

3.01 RESTORING OF FENCES AND GUARD RAILS

A. It may be necessary for the Contractor to remove, store and replace existing fences and guard rails during construction. Only the section directed by the Engineer shall be removed. If any section of fence is damaged due to the Contractor's negligence, it shall be replaced with fencing equal to or better than that damage, and the work shall be satisfactory to the Engineer.

B. Guard rails in the vicinity of the work shall be protected from damage. If damaged, guard rails shall be replaced in condition equal to or better than that existing before construction began.

3.02 CROSSING UTILITIES

This item shall include any extra work required in crossing culverts, water courses, drains, water mains, and other utilities, including all sheeting and bracing, extra excavation and backfill, or any other work required for the crossing, whether or not shown on the drawings.

3.03 RELOCATIONS OF EXISTING GAS LINES, TELEPHONE LINES, ELECTRIC LINES, AND CABLE TV LINES

The Contractor shall notify the proper authority of the utility involved when relocation of these lines is required. The Contractor shall coordinate all work by the utility so that the progress of construction will not be hampered.

3.04 RESTORING THE EASEMENTS (SERVITUDES) AND RIGHTS-OF-WAY

A. Portions of the construction may occur in drainage servitudes. The Contractor shall be responsible for all damage to the property due to his operations. He shall protect from injury all walls, fences, pavement, underground facilities, such as water pipe, or other utilities which may be encountered along the easement. If removal and replacement are required, it shall be done in a workmanlike manner so that the replacement is equivalent to that which existed prior to construction.

B. Existing lawn surfaces damaged by construction shall be re-graded and re-sodded. These areas shall be maintained until all work under this contract has been completed and accepted.

3.05 CLEANING UP

The Contractor shall remove all construction material, excess excavation, buildings, equipment and other debris remaining on the job as a result of construction operations and shall render the site of the work in a neat and orderly condition.

3.06 INCIDENTAL WORK

Do all incidental work not otherwise specified, but obviously necessary, for the proper completion of the contract as specified and as shown on the drawings.

END OF SECTION

SECTION 03100

CONCRETE FORMWORK

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Wood formwork for cast-in-place concrete, complete with shoring, bracing, and anchorage.

B. Coordinate installation of items supplied by other sections of work.

1.02 RELATED WORK

Section 05500: Miscellaneous Metal

1.03 QUALITY ASSURANCE

Construct and erect concrete formwork in accordance with ACI 347 and applicable construction safety regulations for place of work.

1.04 REFERENCES

A. ACI 318 - Building Code Requirements for Reinforced Concrete.

B. ACI 347 - Recommended Practice for Concrete Formwork.

PART 2 - PRODUCTS

2.01 WOOD FORM MATERIALS

A. Plywood: Douglas Fir species; solid one side sheathing grade; sound undamaged sheets with clean true edges.

B. Lumber: Southern Pine species; No. 7 grade; with grade stamp clearly visible.

C. Nails, spikes, lag bolts, through bolts, anchorages: Sized as required; of sufficient strength and character to maintain formwork in place while pouring concrete.

2.02 PREFABRICATED FORMS

A. Steel type: Minimum 4 gage well matched, tight fitting, and adequately stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished concrete surfaces.

B. Pan type: Removable of sizes and profiles required.

2.03 FORMWORK ACCESSORIES

A. Form ties: Snap-off metal type of fixed length; minimum working strength of 3000 psi when assembled; free of defects that will leave holes larger than one inch in concrete surface.

B. Form release agent: Colorless mineral oil which will not stain concrete or impair natural bonding or color characteristics of coating intended for use on concrete.

C. Fillets of chamfered corners: Rigid foam plastic or wooden type; ¾" x ¾" size; maximum possible lengths.

2.04 ACCEPTABLE MANUFACTURERS

Acceptable manufacturers shall be an approved product listed in LADOTD QPL 29.

PART 3 - EXECUTION

3.01 FORMWORK ERECTION

A. Verify lines, levels, and centers before proceeding with formwork. Verify that dimensions agree with drawings.

B. Construct formwork, shoring and bracing to meet design and code requirements, so that resultant finished concrete conforms to required shapes, lines, and dimensions.

C. Arrange and assemble formwork to permit dismantling and stripping, so that concrete is not damaged during its removal.

D. Align joints and make watertight, to prevent leakage of mortar disfigured appearance of concrete. Keep form joints to minimum.

E. Obtain Engineer's review for use of earth forms. When using earth forms, hand-trim sides and bottoms, and remove loose dirt prior to placing concrete.

F. Arrange forms to allow stripping without removal of principal shores, where and when these are required to remain in place.

G. Obtain Engineer's review before framing openings in structural members, which is not indicated on drawings.

H. Provide bracing to ensure stability of formwork. Prop or strengthen previously constructed formwork liable to be overstressed by construction loads.

I. Provide chamfer strips on external corners of beams.

J. Construct formwork to maintain following maximum tolerances.

1. Deviation from horizontal and vertical lines.

a. 1/4 inch in 10 feet.
b. 3/8 inch in 20 feet.
c. 3/4 inch in 40 feet.

K. Apply form release agent on formwork in accordance with manufacturer's recommendations. Apply prior to placing reinforcing steel, anchoring devices, and embedded items.

L. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings which are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces wet prior to placing concrete.

3.02 INSERTS, EMBEDDED PARTS, AND OPENINGS

A. Provide formed openings where required for pipes, conduits, sleeves, and other work embedded in and passing through concrete members.

B. Locate and set in place items which will be cast directly into concrete.

C. Coordinate work of other sections and cooperate with trade involved in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts. Do not perform work unless specifically indicated on drawings or reviewed prior to installation.

D. Install concrete accessories in accordance with manufacturer's recommendations; straight, level, and plumb. Ensure items are not disturbed during concrete placement.

E. Place formed construction joints in pattern pouring sequence. Set top screed to required elevations. Secure to resist movement of wet concrete.

F. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain. Close temporary ports or openings with tight fitting panels, flush with inside face of forms, neatly fitted so that joints will not be apparent in exposed concrete surfaces.

3.03 FIELD QUALITY CONTROL

A. Inspect and check completed formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and parts are secure.

B. Inform Engineer when formwork is complete and has been cleaned, to allow for inspection. Obtain review prior to placing concrete.

C. Allow Engineer to inspect each section of used formwork prior to reuse.

3.04 CLEANING

Clean forms as erection proceeds, to remove foreign matter. Remove cuttings, shavings, and debris from within forms. 'Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.

3.05 FORM REMOVAL

A. Notify Engineer prior to removing formwork.

B. Do not remove forms, shores, and bracing until concrete has gained sufficient strength to carry its own weight, construction and design loads which are liable to be imposed upon it. Verify strength of concrete by compressive test results.

C. Remove formwork progressively and in accordance with code requirements and so that no shock loads or unbalanced loads are imposed on structure.

D. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against concrete surfaces.

E. Leave forms loosely in place, against vertical surfaces, for protection until complete removal is reviewed by Engineer

F. Store removed forms, for exposed architectural concrete, in manner that surfaces to be in contact with fresh concrete will not be damaged. Marked or scored forms will be rejected.

G. Re-shore structural members where required due to design requirements or construction conditions and as required to permit progressive construction. Remove load supporting forms only when concrete has attained 75 percent of required 28-day compressive strength, provided construction is re-shored.

H. Remove forms not directly supporting weight of concrete as soon as stripping operations will not damage concrete.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Reinforcing steel bars, welded steel wire fabric, and fabricated steel bar or rod mats for cast-in-place concrete, complete with tie wire.

B. Support chairs, bolsters, bars supports, spacers for reinforcing.

1.02 RELATED WORK

A. Section 03300: Cast-in-Place Concrete

B. Section 03350: Concrete Finishes

1.03 QUALITY ASSURANCE

Perform concrete reinforcing work in accordance with CRSI PRB unless specified otherwise in this section.

1.04 REFERENCES

A. ACI 318 - Building Code Requirements for Reinforced Concrete

B. CRSI PRB - Placing Reinforcing Bars

C. ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement

D. ASTM A615 - Deformed and Plain Carbon Steel Bars for Concrete Reinforcement

E. ASTM A616 - Rail Steel Deformed and Plain Bars for Concrete Reinforcement

F. ASTM A617 - Axle Steel Deformed and Plain Bars for Concrete Reinforcement

G. ASTM A497 – Steel Welded Wire Reinforcement, Deformed, for Concrete.

H. AWS D1.4 – Structural Welding Code, Reinforcing Steel.

I. ACI 315 - American Concrete Institute – Details and Detailing of Concrete Reinforcement.

1.05 SHOP DRAWINGS

A. Submit shop drawings in accordance with Section 01340.

B. Indicate bar sizes, spacings, locations, and quantities of reinforcing steel and wire fabric, bending and cutting schedules, and supporting and spacing devices.

C. Prepare shop drawings under seal of Professional Structural Engineer registered in the State of Louisiana.

PART 2 - PRODUCTS

2.01 REINFORCING

A. Reinforcing steel: Comply with ASTM A615, Grade 60.

B. Welded steel wire fabric: Comply with ASTM A185.

2.02 ACCESSORY MATERIALS

A. Tie wire: minimum 16-gauge annealed type, or patented system accepted by Engineer.

B. Chairs, bolsters, bar supports, spacers: Sized and shaped for strength and support of reinforcing during construction conditions.

C. Special chairs, bolsters, bar supports, spacers (where adjacent to architectural concrete surfaces) plastic coated type; sized and shaped as required.

2.03 FABRICATION

A. Fabricate concrete reinforcing in accordance with ACI 315.

B. Locate reinforcing splices, not indicated on drawings, at points of minimum stress. Location of splices shall be reviewed by Engineer.

C. Where indicated, weld reinforcing bars in accordance with AWS D1.4.

PART 3 - EXECUTION

3.01 CONCRETE PROTECTION FOR REINFORCEMENT

A. Place and hold steel reinforcement in position so the concrete cover, as measured from the surface of the bar, will be the following, except as otherwise specified or indicated on the Drawings:

1. Cast-in-place concrete (nonprestressed). The following minimum concrete cover shall be provided for reinforcement:

Exposure Conditions	Minimum Cover in Inches (in.)
Concrete cast against and permanently exposed to earth	3
Concrete exposed to earth or weather:	
#6 Through #18 Bars	2
#5 bar, W31 or D31 wire, and smaller	1 ½
Concrete not exposed to weather or in contact with ground for slabs, walls, joints:	
#14 and #18 bars	1 ½
#11 bar and smaller	1 ½
Primary reinforcement, ties, stirrups, spirals for beams and columns	1 ½

2. For precast concrete (manufactured under plant control conditions), the following minimum concrete cover shall be provided for reinforcement:

Exposure Conditions	Minimum Cover in Inches (in.)
Concrete exposed to earth or weather	
Wall panels	
#14 and #18 bars	1 ½
#11 bars and smaller	¾
Other Members	
#14 and #18 bars	2
#6 through #11 bars	1 ½
#5 bar, W31 or D31 wire, and smaller	1 ¼
Concrete not exposed to weather or in contact with the ground	
#14 and #18 bars	1 ¼
#11 bar and smaller	5/8
Beams and columns:	
Primary reinforcement	Nominal Diameter of Bar, Wire or Strand but not less than 5/8 and need not exceeding 1
Ties, stirrups, and spirals	3/8

3.02 PLACING

A. Support and wire all reinforcing bars together to prevent displacement by construction loads or the placing of concrete beyond the tolerances specified. Use supporting concrete blocks on ground surfaces. Use concrete, metal, or plastic bar chairs, over forms. The portion of all accessories in contact with the formwork shall be plastic, galvanized or plastic coated where the concrete surface will be exposed to the weather in the finished structure, or where rust would impair architectural finishes.

B. Furnish and set templates for all column dowels to insure proper placement.

C. Splices, when approved by the Engineer, may be used at locations not shown on the Drawings. All splices shall comply with Standard Structural Details.

D. Reinforcement shall not be bent after being embedded in hardened concrete unless approved by the Engineer.

E. Bars may be moved as necessary to avoid interference with other reinforcing steel conduits, or embedded items. If bars are moved more than one bar diameter, or enough to exceed the above tolerances, the resulting arrangement of bars shall be subject to approval by the Engineer.

3.03 FIELD QUALITY CONTROL

A. Physical properties of reinforcing steel are subject to testing by an independent laboratory for compliance with ASTM A-615. The Contractor shall furnish all samples required for such testing.

B. The Contractor shall give the Engineer twenty-four (24) hour notice of the completion of reinforcing steel setting, and sufficient time before the start of concrete placement to inspect the layout and for Contractor to make any required corrections.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 WORK INCLUDED

Contractor shall furnish all labor, materials, tools, equipment and related items required to do the cast-in-place concrete work as specified herein.

1.02 RELATED WORK

A. Section 03100: Concrete Formwork

B. Section 03200: Concrete Reinforcement

C. Section 05500: Miscellaneous Metal

1.03 QUALITY ASSURANCE

Perform cast-in-place concrete work in accordance with ACI 318, unless specified otherwise in this section.

1.04 TESTING LABORATORY SERVICES

A. Inspection and testing will be performed by firm in accordance with Section 01410.

B. Provide free access to work and cooperate with appointed firm.

C. Submit proposed mix design of each class of concrete to Engineer for review prior to commencement of work.

D. Tests of cement and aggregates may be performed to ensure conformance with requirements stated herein.

E. Minimum four concrete test cylinders will be taken for every pour.

F. One slump test will be taken for each set of test cylinders taken as a minimum: However, slump tests will be taken as often as required by the Engineer or his representative.

1.05 REFERENCES

A. ASTM C33 - Concrete Aggregates

B. ASTM C150 - Portland Cement

C. ACI 318 - Building Code Requirements for Reinforced Concrete

D. ASTM C260 - Air Entraining Admixtures for Concrete

E. ASTM C494 - Chemical Admixtures for Concrete

F. ASTM C94 - Ready-Mixed Concrete

G. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete

H. ACI 305 - Recommended Practice for Hot Weather Concreting

I. ACI 306 - Recommended Practice for Cold Weather Concreting

J. ACI 301 - Specifications for Structural Concrete

PART 2 - PRODUCTS

2.01 CONCRETE MATERIALS

A. Cement: Normal-Type II, High early strength-Type III, Portland type, ASTM C150.

B. Fine and Coarse Aggregates: ASTM C33. At the time of its use, the aggregate shall be free from all foreign material or dirt which may become mixed with the aggregate stockpile. If less than 2% of the fine aggregate passes a No. 100 sieve, limestone dust shall be added to provide this minimum percentage.

C. Water: Clean, fresh and free from injurious amounts of oil, alkali, organic matter, or other deleterious material.

2.02 ADMIXTURES

Each of the following admixtures shall be used when required and shall be used when so instructed by the Owner. They shall comply with the appropriate specifications as indicated.

A. Air Entrainment: ASTM C260.

B. Chemical: ASTM C494 Type A - water reducing and Type B - retarding admixture.

2.03 ACCEPTABLE MANUFACTURERS

The Acceptable Manufacturers of ready mix concrete must have sufficient plant capacity

and ready mix transportation trucks to insure a continuous delivery to the job site; the rate should be such that the interval between batches shall not exceed 20 minutes. The methods of delivering the concrete shall be such that they will facilitate its placing with a minimum of rehandling and without damaging the concrete or its forms.

2.04 ACCESSORIES

A. Bonding Agent: Two component modified epoxy resin; Non-solvent two component polysulphide-epoxy; Mineral filled polysulphide polymer epoxy resin. Acceptable manufacturers shall be an approved product listed in LADOTD QPL 32.

B. Non-shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2400 psi in 2 days and 7000 psi in 28 days.

2.05 CONCRETE MIXES

A. Mix concrete in accordance with ASTM C94.

B. Provide concrete of following strength:

1. Compressive strength 4000 psi.
2. Select proportions for normal weight concrete in accordance with ACI 301 3.8 by Method 1, Method 2, or Method 3. Add air entraining agent to concrete to entrain air as indicated in ACI 301 Table 3.4.1.

B. Add air entraining agent to concrete mix for concrete work exposed to exterior.

D. Weather Conditions

1. Cold Weather

a. The minimum temperature of the concrete when delivered at the site of the work shall conform to the following temperature limitation:

Air Temperatures, ^{0}F.	For Sections Less than 12" Thick, Minimum Concrete Temperature, ^{0}F.	For Sections between 12" and 36" Thick, Minimum Concrete Temperature, ^{0}F.
30 to 45	60	50
0 to 30	65	55
Below 0	70	60

2. Provisions shall be made for maintaining concrete moist and at a minimum

temperature of not less than 50°F for a period of at least 7 days.

3. Hot Weather

    a. The maximum temperature of the concrete when delivered at the site of the work shall not exceed 85 degrees Fahrenheit.
    b. The ingredients shall be cooled before mixing, or flake ice or well-crushed ice of a size that will melt completely during mixing may be substituted for all or part of the mixing water if necessary to maintain the temperature of the concrete below 85 degrees Fahrenheit.
    c. A retarding agent complying with ASTM C-494 Type B shall be used under the following circumstances:

        i. If the temperature of the air is above 85 degrees Fahrenheit.
        ii. If the temperature of the concrete as placed is above 80 degrees Fahrenheit.
        iii. Where large pours are permitted, to allow all portions to remain plastic until adjacent concrete is placed.

2.06 CIP CONCRETE SANITARY SEWER STRUCTURES

A. CIP concrete used in sewer structures shall be waterproofed with a crystalline concrete waterproofing additive. The concrete waterproofing admixture shall be of the cementitious crystalline type that chemically controls and permanently fixes a non-soluble crystalline structure throughout the capillary voids of the concrete.

B. The design shall include the use of the crystalline waterproofing repair materials that generate a non-soluble crystalline formation in the concrete.

C. The waterproofing product shall be Xypex Admix C-1000R at a rate of 20 lbs. per cubic yard containing red dye, to ensure detection in the final concrete product, as manufactured by Xypex Chemical Corporation, Richmond, B.C., Canada, or an equivalent material as approved by the Engineer. For finishing of cut outs, repairs and patching, Xypex Concentrate or an approved equivalent shall be applied as indicated below. Concrete used in wet wells, structures within one hundred feet (100') of wet wells, structures eight feet (8') or greater in depth and structures with force main discharges shall be additionally fortified with Conshield.

D. For exposed concrete Xypex Admix C1000 at a rate of 15 pounds per cubic yard, no dye shall be used. The Contractor shall supply documentation that Xypex was added at the plant. Concrete used in wet wells, structures within one hundred feet (100') of wet wells, structures eight feet (8') or greater in depth and structures with force main discharges shall be additionally fortified with Conshield. Xypex BioSan may be used as an alternate to Conshield.

E. Fiberglass, polymer concrete by; "U.S. COMPOSITE PIPE, INC." or approved equal, or concrete "fortified with Conshield" (in addition to Xypex), is required for lift station wet wells, and manholes within close proximity (100 yards) of lift stations,

deep (8 feet and above) manholes and any manhole which is or will be receiving a force main.

PART 3 - EXECUTION

3.01 PLACING CONCRETE

A. Place concrete in accordance with ACI 304.

B. Notify Engineer minimum 24 hours prior to commencement of concreting operations.

C. Verify anchors, seats, plates, and other items to be cast into concrete are placed, held securely, and will not cause hardship in placing concrete. Rectify same and proceed with work.

D. Maintain records of poured concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

E. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints, are not disturbed during concrete placement.

F. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon discovery.

G. Conform to ACI 305 when concreting during hot weather.

H. Conform to ACI 306 when concreting during cold weather.

3.02 PATCHING

Allow Engineer to inspect concrete surfaces immediately upon removal of forms. Patch imperfections as directed.

3.03 DEFECTIVE CONCRETE

A. Modify or replace concrete not conforming to required lines, details and elevations.

B. Repair or replace concrete not properly placed resulting in excessive honeycombing and other defects. Do not patch, fill touch-up, repair, or replace concrete except upon express direction of Engineer for each individual area.

3.04 CURING AND PROTECTION

Beginning immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury. Maintain concrete with

minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

END OF SECTION

SECTION 03350

CONCRETE FINISHES

PART 1 - GENERAL

1.01 SCOPE OF WORK

Furnish all labor, materials, equipment, and incidentals required to finish cast-in-place concrete surfaces as specified herein.

1.02 RELATED WORK

Patching and repair of defective and honeycombed concrete is included in Section 03300.

1.03 SUBMITTALS

Submit to the Engineer as provided in the General Conditions and Section 01340, the proposed chemical hardener manufacturers' surface preparation and application procedures.

1.04 SCHEDULE OF FINISHES

A. Concrete for the project shall be finished in the various specified manners either to remain as natural concrete or to receive an additional applied finish or material under another section.

B. The base concrete for the following conditions shall be finished as noted and as further specified herein:

1. Concrete to receive waterproofing and dampproofing - Off-form finish.
2. Exterior exposed concrete slabs, walkways and stairs - broomed finish.
3. Concrete on which liquids flow - steel trowel finish.
4. Concrete where not exposed in the finished work and not scheduled to receive an additional applied finish or material - Off-form finish.

1.05 RESPONSIBILITY FOR CHANGING FINISHES

A. The surface finishes specified for concrete to receive additional applied finishes or materials are the finishes required for the proper application of the actual products specified under other sections. Where different products are approved for use, it shall be the Contractor's responsibility to determine if changes in finishes are required and to provide the proper finishes to receive these products.

B. Changes in finishes made to accommodate products different from those specified shall be performed at no additional cost to the Owner. Submit the proposed new finishes and their construction methods to the Engineer for approval.

PART 2 - PRODUCTS

2.01 MATERIALS

Portland cement and component materials required for finishing the concrete surfaces shall be as specified in Section 03300.

PART 3 - EXECUTION

3.01 FORMED SURFACES

A. Forms shall not be stripped before the concrete has attained a strength of at least 30 percent (30%) of the ultimate design strength. This is equivalent to approximately "100-day degrees" of moist curing.

B. Care shall be exercised to prevent damaging edges or obliterating the lines of chamfers or corners when removing the forms or doing any work or work adjacent thereto.

C. Clean all exposed concrete surfaces and adjoining work stained by leakage of concrete, to the satisfaction of the Engineer.

D. Off-form finish. Fins and other projections shall be removed as approved. Tie cone holes and other minor defects shall have been filled under Section 03300.

3.02 FLOORS AND SLABS

A. Floors and slabs shall be screeded to the established grades and shall be level with a tolerance of 1/8" when checked with a 12' straightedge, except where drains occur, in which case floors shall be pitched to drains as indicated. Failure to meet either of above shall be cause for removal, grinding, or other correction as directed by the Engineer.

B. Following screeding as specified above, power steel trowel as follows:

1. Immediately after final screeding a dry cement/sand shake in the proportion of two (2) sacks of portland cement to 350 pounds of coarse natural concrete sand shall be sprinkled evenly over the surface at the rate of approximately 500 pounds per 1,000 square feet of floor. Neat, dry cement shall not be sprinkled on the surface. This shake shall be thoroughly floated into the surface with an approved disc type power compacting machine weighing at least 200 pounds if a 20" disc is used or 300 pounds if a 24" disc is used. A mechanical blade-type float or trowel is not acceptable for this work.

Note: This operation (application of the cement/sand shake) may be eliminated at the discretion of the Engineer if the base slab concrete exhibits adequate fatness and homogeneity, and the need is not indicated.

2. In lieu of power steel troweling, small areas as defined by the Engineer shall be compacted by hand steel troweling with the dry cement/sand shake as ordered.
3. The floor or slab shall be compacted to a smooth surface and the floating operation continued until sufficient mortar is brought to the surface to fill all voids. The surfaces shall be tested with a straightedge to detect high and low spots which shall be eliminated.
4. Compaction shall be continued only until thorough densification is attained and a small amount of mortar is brought to the surface. Excessive floating shall be avoided.

C. After Paragraph 3.02-A and B procedures are accomplished, floors and slabs for particular conditions shall be completed as scheduled in one of the following finishes:

1. Wood float finish. Hand wood float, maintaining the surface tolerance to provide a grained, non-slip finish as approved.
2. Broomed finish. Hand wood float maintaining the surface tolerance and then broom with a stiff bristle broom in the direction of drainage to provide a non-slip finish as approved.
3. Steel trowel finish. Hand steel trowel to a perfectly smooth, hard even finish free from high or low spots or other defects as approved.

3.03 APPROVAL OF FINISHES

A. All concrete surfaces will be inspected during the finishing process by the Engineer.

B. Surfaces which, in the opinion of the Engineer, are unsatisfactory shall be refinished or reworked until approved by the Engineer.

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 03455

MANHOLES

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all materials, labor, and equipment and construct manholes consisting of precast sections or cast-in-place as shown on the drawings and specified herein.

B. The Contractor shall construct watertight structures.

C. All cast-in-place manholes and structures shall meet the requirements of the latest edition of the Louisiana Department of Transportation and Development Standard Specifications for Roads and Bridges Section 702 and the drawings.

1.02 RELATED WORK NOT INCLUDED

A. Section 02221: Earth Excavation and Backfill in Trenches.

B. Section 03300: Cast-in-Place Concrete

C. Section 05500: Miscellaneous Metal

D. Section 09800: Special Coatings

1.03 SUBMITTALS

Submit to the Engineer, as provided in the contract documents, shop drawings showing details of construction, reinforcing, and joints.

1.04 INSPECTION

A. The quality of all materials, the process of manufacture, and the finished sections shall be subject to inspection and approval by the Engineer, or other representatives of the Owner. Such inspection may be made at the place of manufacture, or at the site after delivery, or at both places, and the sections shall be subject to rejection at any time on account of failure to meet any of the specification requirements; even though sample sections may have been accepted as satisfactory at the place of manufacture. Sections rejected after delivery to the job shall be marked for identification and shall be removed from the job at once. All sections, which have been damaged after delivery will be rejected, and if already installed, shall be acceptably repaired, if permitted, or removed and replaced, entirely at the Contractor's expense.

B. At the time of inspection, the sections will be carefully examined for compliance with the ASTM designation specified below and these specifications, and with the approved manufacturer's drawings. All sections shall be inspected for general appearance, dimension, "scratch-strength", blisters, cracks, roughness, soundness, etc. The surface shall be dense and close-textured.

C. Imperfections may be repaired, subject to the approval of the Engineer, after demonstration by the manufacturer that strong and permanent repairs result. Repairs shall be carefully inspected before final approval. Cement mortar used for repairs shall have a minimum compressive strength of 4,000 psi at the end of 7 days and 5,000 psi at the end of 28 days, when tested in 3" by 6" cylinders stored in the standard manner. Epoxy mortar may be utilized for repairs subject to the approval of the Engineer.

1.05 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM C443– Standard Method for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
2. ASTM C478 – Standard Method for Precast Reinforced Concrete Manhole Sections

PART 2 - PRODUCTS

2.01 PRECAST CONCRETE SECTIONS

A. Precast concrete manhole barrel and eccentric top sections shall conform to the specifications for Precast Reinforced Concrete Manhole sections, ASTM Designation C478, except as otherwise specified below. The method of construction shall conform to the drawings and the following additional requirements.

1. The minimum wall thickness for the various size barrel sections shall be as listed below.

Inside Diameter of Barrel	**Minimum Wall Thickness**
48"	5"
60"	6"
72"	7"

Note: See Section 8 below

2. Barrel sections shall have tongue and groove joints. Joints shall have round rubber gaskets set in specially provided indentations. The round rubber "O"-ring gasket shall conform to ASTM C443 standard specifications.
3. Type II cement shall be used except as otherwise approved.
4. The date of manufacture and the name or trademark of the manufacturer shall be

clearly marked on the inside of each precast section.

5. Sections shall be cured by an approved method and shall not be shipped until at least five (5) days after having been fabricated.
6. Top sections shall be eccentric except that precast concrete slabs shall be used where cover over the top of the pipe is less than four feet (4') for all manholes. Top sections for quick connect coupling manholes shall be concentric as shown on the drawings.
7. Precast concrete slabs over top section, where required, shall be capable of supporting the overburden plus a live load equivalent to AASHTO H-20 loading.
8. The tops of bases shall be suitably shaped to mate the precast barrel section.

2.02 PRECAST SANITARY SEWER MANHOLES

A. Precast sanitary sewer manholes shall be waterproofed with a crystalline concrete waterproofing for precast concrete manholes. The concrete waterproofing admixture shall be of the cementitious crystalline type that chemically controls and permanently fixes a non-soluble crystalline structure throughout the capillary voids of the concrete.

B. The design shall include the use of the crystalline waterproofing repair materials that generate a non-soluble crystalline formation in the concrete.

C. The waterproofing product shall be Xypex Admix C-1000R at a rate of 20lbs per cubic yard containing red dye, to ensure detection in the final concrete product, as manufactured by Xypex Chemical Corporation, Richmond, B.C., Canada, or an equivalent material as approved by the Engineer. For finishing of cut outs, repairs and patching, Xypex Concentrate or an approved equivalent shall be applied as indicated below. Concrete used in wet wells, structures within one hundred feet (100') of wet wells, structures eight feet (8') or greater in depth and structures with force main discharges shall be additionally fortified with Conshield. Xypex BioSan may be used as an alternate to Conshield.

D. Fiberglass, polymer concrete by; "U.S. COMPOSITE PIPE, INC." or approved equal, or concrete "fortified with Conshied" (in addition to Xypex), is required for lift station wet wells, and manholes within close proximity (100 yards) of lift stations, deep (8 feet and above) manholes and any manhole which is or will be receiving a force main.

E. Rejection of Precast Products: Should any precast structure arrive on site without the Xypex or Conshield additive the CONTRACTOR shall promptly notify the ENGINEER. The OWNER may propose a replacement product or alternative coating systems that shall be applied at the CONTRACTORS expense. The acceptance of the product, replacement product or proposed alternative coating method shall be at the discretion of the OWNER. NO EXCEPTIONS.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Manholes and other precast structures shall be constructed to the dimensions as shown on the drawings and as specified herein.

B. The base shall be cast-in-place concrete as shown on the drawings and placed on a thoroughly compacted limestone subbase. The tops of the cast-in-place bases shall be shaped to mate with the precast barrel section, and shall be adjusted in grade so that the top of the dome section is at the approximately correct elevation.

C. Precast bases, conforming to all requirements of ASTM C478 and above listed requirements for precast sections, may be used.

D. Precast concrete structure sections shall be set so as to be vertical and with sections in true alignment with a 1/4" maximum tolerance to be allowed. The outside and inside joint shall be "ram-nek" or filled with a comparatively dry mortar (one part cement to two parts sand) and finished flush with the adjoining surfaces. If "ram-nek" is used, inside joint shall still be sealed with mortar. Allow joints to set for 24 hours before backfilling. Backfilling shall be done in a careful manner, bringing the fill up evenly on all sides. If leaks appear in the structures, the inside joints shall be caulked with lead wool to the satisfaction of the Engineer. The Contractor shall install the precast section in a manner that will result in a watertight joint.

E. Holes in the concrete pipe sections required for handling or other purposes shall be plugged with a non-shrinking grout or by grout in combination with concrete plugs.

F. Where holes must be cut in the precast sections to accommodate pipes, cutting shall be done prior to setting them in place to prevent any subsequent jarring which may loosen the mortar joints.

G. Cast iron frames specified and furnished shall be placed, shimmed, and set in portland cement mortar to the required grade.

H. Pipe stub outs for all gravity sewer manhole connections shall not exceed 2 feet in length. Caps or plugs shall be furnished where required. Gravity sewer lines shall be connected to the manhole using flexible, resilient rubber connections in the manhole wall.

I. Gravity sewer manholes shall have an invert channel shaped to correspond with the lower half of the gravity sewer. The top of the shelf shall be at the elevation nearly equal to the pipe diameter and shall be sloped to drain toward the flow-through channel.

END OF SECTION

SECTION 05500

MISCELLANEOUS METAL

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required and install covers, grates, frames, manhole rungs, catch basin castings, and other miscellaneous metal as shown on the drawings and specified herein. The miscellaneous metal items include, but are not limited to, the following:

1. Anchors or anchor bolts except those specified to be furnished with all equipment.
2. Cast iron frames, covers, grates.
3. Steel pipe casings, plates, angle frames, plates, and miscellaneous angles and channels as shown on the drawings.
4. Ductile iron joint restraints, glands, restraining glands.

1.02 RELATED WORK

A. Section 02615

B. Section 15100.

1.03 COORDINATION

A. The work of this section shall be completely coordinated with the work of other sections. Verify at the site both the dimensions and work of other trades adjoining items of work in this section before fabrication and installation of items herein specified.

B. Furnish to the pertinent trades all items included under this section that are to be built into the work of other sections.

1.04 SHOP DRAWINGS

Detail drawings, as provided for in the General Conditions and Section 01340, showing sizes of members, method of assembly, anchorage, and connection to other members shall be submitted to the Engineer for approval before fabrication.

1.05 FIELD MEASUREMENTS

Field measurements shall be taken at the site to verify or supplement indicated dimensions and to insure proper fitting of all items.

1.06 REFERENCE SPECIFICATIONS

Unless otherwise specified, materials shall conform to the following:

Carbon Structural Steel	ASTM A36
Welded and Seamless Steel Pipe	ASTM A53
Gray Iron Castings	ASTM A48, Class 30
Galvanizing, general	ASTM A123
Galvanizing, hardware	ASTM A153
Galvanizing, assemblies	ASTM A386
Aluminum (extruded shapes)	ASTM B209, 6063 T5 (Alum. alloy)
Aluminum (extruded pipe)	ASTM B209, 6063 T6 (Alum. alloy)
Aluminum Sheet and Plate	ASTM B209, 6061 T6 (Alum. alloy)
Bolts and Nuts	ASTM A307
Stainless Steel Bolts, Bars, Shapes	AISI, Type 302
Stainless Steel Plate and Sheet	AISI, Type 304
Welding Rods for Steel	AWS Spec. for Arc Welding

PART 2 - PRODUCTS

2.01 ANCHORS, BOLTS, AND FASTENING DEVICES

A. Anchors, bolts, etc., shall be furnished as necessary for installation of the work of this section.

B. The bolts used to attach the various members to the anchors shall be the sizes shown or required.

C. Wedge anchors shall be an imperial-sized steel threaded stud with an integral cone expander and a three-segment expansion clip. The stud shall be manufactured from carbon steel unless specified as stainless and the expansion clip shall have two undercutting embossments per segment and be manufactured from 316 stainless steel. The anchor shall have been tested and qualified for performance in cracked concrete per ACI 355.2 and ICC-ES AC193. Material shall be as noted on the drawings. If not listed, galvanized steel.

2.02 STEEL ITEMS

A. Galvanized steel grating shall be fabricated as shown. Angle frames for hatches, beams, grates, etc., shall be furnished complete with welded strap anchors attached. Furnish all miscellaneous aluminum shown but not otherwise detailed.

B. Sleeves shall be steel or cast-iron pipe in walls and floors with end joints as shown on the drawings. All pipe sleeves shall have center anchor around circumference as shown.

C. Miscellaneous steel pipe for sleeves and lifting attachments and other uses as required

shall be Schedule 40 pipe fabricated according to the details as shown on the drawings.

D. Miscellaneous steel shall be fabricated and installed in accordance with the drawings and shall include; angles, support brackets, splice plates, anchor bolts; and any other miscellaneous steel called for on the drawings and not otherwise specified.

2.03 CAST IRON FRAMES AND COVERS

A. Heavy duty manhole frame and cover shall be as manufactured by East Jordan Iron Works, Inc., Pattern V1503 standard size or approved equal. Covers to have letters "WATER", "SEWER" or "DRAIN" embossed on top, as required.

B. Valve Boxes: Valve boxes shall be of strong, tough even-grained cast iron. Valve boxes shall be two-part screw type adjustable with covers having the word "SEWER" or "WATER" embossed on top as applicable. Valve boxes shall be screw type with drop a lid, unless otherwise specified.

C. Catch Basins: Catch basin frames and covers shall be Vulcan Foundry No. V-4311-1 or approved equal, unless otherwise shown on the Drawings.

2.04 HATCHES

A. Direct Traffic Condition:

The floor access doors shall be galvanized steel, AASHTO H20-44 wheel load rated. Manufacturer must provide structural calculations, stamped by a registered professional engineer, that certify that the door design meets the requirements of AASHTO H20-44.

Galvanized steel hatches shall be a minimum 1/2 inch thick slip resistant plate reinforced to an AASHTO H20-44 wheel load with 30% impact factor. The frame shall be a minimum ½" inch thick steel angle with welded nelson stud anchors or other approved embedment anchors. The entire frame shall be supported by concrete or other material designed to support the cover loading. The frame and cover shall have recessed 316 SS special bolting to allow for Direct Continuous H20 Traffic Loading. The floor access door shall be equipped with a flush steel lifting handle that does not protrude above the cover. The floor access doors shall be equipped with 316 SS lifting assist mechanism(s) and automatic locking hold open arms. The doors shall have a watertight stainless steel slam lock operated by a removable key from the outside and by a fixed handle inside. The doors shall have a recessed staple for padlock consisting of a fabricated steel box and a hinged lid with bolt lock for access to the padlock. A steel skirt shall be welded to the frame to provide a combined height equal to the depth of the concrete slab. The floor access doors and frame shall be hot-dipped galvanized after fabrication. The Hatch Access unit shall also incorporate a fall through protection system consisting of hinged aluminum safety grating with lifting handle(s) and 316 SS hardware. The Installation shall be in accordance with the manufacturer's attached instructions. Manufacturer shall guarantee against defects in materials and workmanship for a period of five (5) years.

B. In Direct Traffic Condition

The floor access doors and frame material shall be aluminum and AASHTO H-20 wheel load rated. Approved manufactures are U.S.F Fabrication, Inc., Babcock Davis, LW Products or approved equal. Manufacturer must provide structural calculations, stamped by a registered professional engineer, that certify that the door design meets the requirements of AASHTO H20. Door leafs shall be a minimum ¼ inch thick aluminum slip resistant plate reinforced to an AASHTO H-20 wheel load. The frame shall have sufficient anchors for concrete embedment. The entire frame shall be supported by concrete or other material designed to support the cover loading. The floor access door shall be equipped with a flush 316 SS lifting handle that does not protrude above the cover. The floor access doors shall be equipped with 316 SS lifting assist mechanism(s) and automatic locking hold open arms. The doors shall have a watertight stainless steel slam lock operated by a removable key from the outside and by a fixed handle inside. The doors shall have a recessed staple for padlock consisting of a fabricated box and a hinged lid with bolt lock for access to the padlock. A aluminum skirt shall be welded to the frame to provide a combined height equal to the depth of the concrete slab. The Hatch Access unit shall also incorporate a fall through protection system consisting of hinged aluminum safety grating with lifting handle(s) and 316 SS hardware. The Installation shall be in accordance with the manufacturer's attached instructions. Manufacturer shall guarantee against defects in materials and workmanship for a period of five (5) years.

PART 3 - EXECUTION

3.01 FABRICATION

A. All miscellaneous metal work shall be formed true to detail, with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture and free from defects impairing strength or durability.

B. Connections and accessories shall be of sufficient strength to safely withstand stresses and strains to which they will be subjected. Steel accessories and connections to steel or cast iron shall be steel, unless otherwise specified. Threaded connections shall be made so that the threads are concealed by fitting.

C. Welded joints shall be rigid and continuously welded or spot welded as specified or shown. The face of welds shall be dressed flush and smooth. Exposed joints shall be close fitting and jointed where least conspicuous.

D. Welding of parts shall be in accordance with the Standard Code for Arc and Gas Welding in Building Construction of the AWS and shall only be done where shown, specified, or permitted by the Engineer. All welding shall be done only by welders certified as to their ability to perform welding in accordance with the requirements of the AWS Code. Component parts of built-up members to be welded shall be adequately

supported and clamped or held by other adequate means to hold the parts in proper relation for welding.

E. Welding of aluminum shall conform to the applicable provisions of the AA-30 for aluminum structures. The general recommendations and regulations of AWS D1.1 as applicable shall apply to welded aluminum.

F. Castings shall be of good quality, strong, tough, even-grained, smooth, free from scale, lumps, blisters, sand holes, and defects of any kind which render them unfit for the service for which they are intended. Castings shall be thoroughly cleaned and will be subjected to a hammer inspection in the field by the Engineer. All finished surfaces shown on the drawings and/or specified shall be machined to a true plane surface and shall be true and seat at all points without rocking. Allowances shall be made in the patterns so that the thickness specified or shown shall not be reduced in obtaining finished surfaces. Castings will not be acceptable if the actual weight is less than 95 percent of the theoretical weight computed from the dimensions shown. The Contractor shall provide facilities for weighing castings in the presence of the Engineer showing true weights, certified by the supplier.

G. All steel finish work shall be thoroughly cleaned, by effective means, of all loose mill scale, rust, and foreign matter before shipment and shall be given one shop coat of primer compatible with finish coats specified in Painting Section after fabrication but before shipping. Paint shall be applied to dry surfaces and shall be thoroughly and evenly spread and well worked into joints and other open spaces. Abrasions in the field shall be touched up with primer immediately after erection.

H. Galvanizing, where required, shall be the hot-dip zinc process after fabrication. Following all manufacturing operations, all items to be galvanized shall be thoroughly cleaned, pickled, fluxed, and completely immersed in a bath of molten zinc. The resulting coating shall be adherent and shall be the normal coating to be obtained by immersing the items in a bath of molten zinc and allowing them to remain in the batch until their temperature becomes the same as the bath. Coating shall be not less than 2 oz. per sq. ft. of surface.

3.02 INSTALLATION

A. All steel surfaces to come in contact with exposed concrete shall receive a protective coating of an approved heavy bitumastic troweling mastic applied in accordance with the manufacturer's instructions prior to installation.

B. Where aluminum contacts a dis-similar metal, apply a heavy brush coat of zinc-chromate primer followed by two coats of aluminum metal and masonry paint to the dis-similar metal.

C. Where aluminum contacts concrete, apply a heavy coat of approved alkali resistant paint to the concrete.

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 09800

PROTECTIVE COATINGS

PART 1 - GENERAL

1.01 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 All materials delivered to job site shall be in original sealed and labeled containers of the paint manufactured.

1.03 Coatings shall be applied during good painting and coating weather. Air and surface temperatures a 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.

1.04 Upon completing the installation of the protective coatings, the Contractor must obtain written certification from the manufacturer that all work has been performed within the limits prescribed by the manufacturer.

PART 2 - PRODUCTS

2.01 MATERIALS

All materials specified herein are manufactured by Tnemec Co., Inc., WBE Dorcas, Inc. and CCI Spectrum, Inc. These products are specified to establish standards of performance and quality and are approved for use on this project.

2.02 SUBSTITUTIONS

A. Equivalent materials of other manufacturers may be substituted on approval of the Engineer. Requests for substitution shall include Manufacturer's literature for each product 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. Bidders desiring to use coatings other than those specified shall submit their proposal in writing to the Engineer. Substitutions that decrease the film thickness, the number of coats applied, change the generic type of coating, or fail to meet the performance criteria of the specified materials will not be approved. Prime and finish coats of all surfaces shall be furnished by the same manufacturer.

2.03 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.

C. Color Selection

1. 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.

Color	Standard	Color	Standard
Red	11105	Blue	15120
Yellow	13655	Purple	17142
Orange	12246	White	17875
Green	14260	Black	17038

2. The 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.
3. Generally, different colors will be selected for pumps, equipment, piping, valves and electrical items, and for interior and exterior locations.

2.04 COATING SCHEDULE

A. Metal Surfaces - Exterior Environment (not subject to corrosive gases)

Surface Preparation for Carbon Steel: SSPC-SP10 Near-White Blast Cleaning.

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

Dry Film-Mils

1st Coat	Epoxy-Polyamide Primer	5.0 - 6.0
2nd Coat	Epoxy-Polyamide Primer	5.0 - 6.0
3rd Coat	Aliphatic Acrylic Polyurethane	5.0 - 6.0

Description: All metal surfaces without factory finish not installed within an enclosed structure including buried piping and fittings, couplings, adaptors, valves, vaults, control panel enclosures, etc.

Aluminum, Stainless Steel and Galvanized Steel shall not to be coated unless approved by the Engineer or Owner.

B. Metal Surfaces - Corrosive Gas or Immersion Environment

Surface Preparation for Carbon Steel SSPC-SP10 Near-White Blast Cleaning

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

		Dry Film-Mils
1st Coat	Polyamidoamine Epoxy	5.0 - 6.0
2nd Coat	Cycloalphatic Amine Epoxy	5.0 - 6.0
3rd Coat	Cycloalphatic Amine Epoxy	5.0 - 6.0

Description: Metal surfaces exposed in lift station, wet well, manholes or similar locations including piping and fittings, valves, pumps, brackets, supports, etc.

Aluminum and Stainless Steel shall not to be coated unless approved by the Engineer or Owner.

If surface is subject to UV exposure, consult with coating manufacturer.

C. Interior of Existing concrete structures:

Description: Structures that hold liquids or are subject to corrosive gases and liquids, buried concrete or brick structures holding liquids such as wet wells and manholes.

1. Application procedures shall conform to recommendations of the manufacturer, including materials handling, mixing, environmental controls during application, safety and spray equipment
2. Approved Products

    a. 100% Solids Epoxy (Tnemec Permashield or approved equal)

1) Surface Preparation: Allow new concrete to cure for 28 days, verify dryness by ASTM D4263. 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.
2) Materials:

		Dry Film-Mils
1st Coat	Surfacer: Cementitious Epxoy Resurfacer Tnemec Series 218 Motarclad or approved equal	1/16"
2nd Coat	Lining: 100% Solids Polyamine Epoxy Mortar Tnemec Series 434 H2S Permashield or approved equal	125 mils
3rd Coat	Glaze Coat: 100% Solids Polyamine Epoxy Tnemec Series 435 H2S Permaglaze or approved equal	12.0 – 15.0

b. Multi-Component Polymeric Stress Skin System (Spectrashield or approved equal)

1) 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.
2) Materials:

i. Modified polymer shall be spray able, solvent free, two components polymeric, moisture/chemical barrier specifically developed for the corrosive wastewater environment.
ii. Final installation shall be a minimum of 500 mils.
iii. A permanent identification and date of installation shall be a fixed to the structure in a readily visible location.

c. H2S Resistant Cementitious Modified Silica Mortar and Amine Cured Epoxy Coating (Dinjer CMS 10-K and SG Mastic or approved equal)

1. 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.
2. Materials (All shall be from the same manufacturer)

a. Cementitious Coating (Dinjer CMS-10K or approved equal)
i. Quick setting, high strength, sulfide resistant, calcium aluminate-based or portland cement material.
ii. Suitable for troweling or rotary spray application to inside of manhole.
iii. Use additives to increase corrosion resistance or bond strength at manufacturer's direction and with Contract Manager's approval.
iv. Density when applied: 135 lb./cf +/- 5 lb./cf.

v. Compressive strength (ASTM C109) at 1 day Minimum acceptable: 2,000 psi.
vi. Compressive strength (ASTM C109) at 28 days Minimum acceptable: 5,500 psi.
vii. Bond Strength (ASTM C882) at 28 days minimum acceptable: 1,640 psi.
viii. Flexural Strength (ASTM C78) at 28 days minimum acceptable: 1,500 psi.
xi. Shrinkage (ASTM C596) at 28 days: 0 percent.

b. Amine Epoxy (Dinjer SG Mastic or approved equal)
i. Final installation shall be a minimum of 100 mils at 16 square feet per gallon minimum.
ii. Compressive strength (ASTM D-695) at 1 day Minimum acceptable: 12,000 psi.
iii. Compressive strength (ASTM D-695) at 7 days Minimum acceptable: 13,000 psi.
iv. Bond Strength (ASTM C882) at 14 days minimum acceptable: 3,000 psi.
v. Flexural Strength (ASTM D-790) at 28 days minimum acceptable: 13,000 psi.

D. Interior and Exterior of new concrete structures see Specifications 03300 and 03455

2.05 PERFORMANCE REQUIREMENTS

A. Epoxy Polyamide: Epoxy polyamide shall contain no lead or soluble chromates. Epoxy-polyamide 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: 56.0 +/- 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 66 or equal.

B. High Solids Catalyzed Epoxy – Amine:

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 or equal.

C. High – Build Coal Tar Epoxy: Minimum of 68% epoxy resin and 32% coal tar pitch. Maximum of 2.73 lbs Volatile Organic Compounds (VOC) after thinning.

1. Minimum Solids per Gallon: 75.0 +/- 2.0%
2. Abrasion: No more than 145 mg loss after 1000 cycles (ASTM D 4060 CS-17 Wheel, 1,000 grams load)
3. Adhesion: Steel - Not less than 800 psi pull average of three trials (Elcometer Adhesion Tester). Concrete - Not less than 350 psi pull average of three trials (Elcometer Adhesion Tester)
4. Impact Resistance: Not less than 40 inch/lbs average (ASTM D 2794, direct impact).
5. Salt Spray Resistance: No blistering, rusting, cracking, softening or delamination of the film. No rust creepage at scribe after 9000 hours exposure (ASTM B 117).
6. Manufacturer: Tnemec 46H-413 or equal.

D. Modified Aliphatic Amine Epoxy Mortar: Aggregate – reinforced 100% solids, hybrid epoxy mortar. Maximum of 0.79 lbs/gallon volatile organic compounds (VOC) (unthinned).

1. Minimum Solids per Gallon: 100%
2. Chemical Resistance: No blistering, cracking, erosion, softening, swelling, or loss of adhesion or gloss after 98 day continuous immersion at 100F and 25% sulfuric acid (ASTM D 868 Atlas Cell).
3. Impact Resistance: No visible cracking or delamination after 160 in lbs (ASTM D 2794, direct impact).
4. ASTM G 210 Severe Wastewater Analysis Test: Minimal initial impedance of 10 Log Z (Z in ohms cm2 @ 0.1 hz). No blistering, cracking, checking or loss of adhesion. Final impedance greater than 9 Log Z after 28 days exposure.
5. Manufacturer: Tnemec 434 or equal.

E. Polyurethane Multi-Component Stress Skin System

Tensile Strength (PSI)	ASTM D412	2670
Elongation (%)	ASTM D412	430
100% Modulus	ASTM D412	2200

300 % Modulus	ASTM D412	2600
Tear Strength (PLI)	ASTM D2240	280
Hardness (shore D)	ASTM D1737	42D
Flexibility (1/ 8 "Mandrel)	ASTM D1737	Pass
Flashpoint (°F)	ASTM Pensky-Martin	>200
Taber Abrasion (mg loss)	ASTM D4060	25

The supplied lining system shall include a 10-year limited warranty covering both materials AND installation beginning on the date of final acceptance. Both the Manufacturer and the Applicator shall stand behind this warranty for 10 years.

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 tough-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.

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 contracting 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. Request acceptance of each coat before applying next coat.

C. 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 coating contractor is to regularly check his work with these devices to make sure that dry-film thickness 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 09900

PAINTING

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The work of this section consists of furnishing all materials, labor, equipment and incidentals required and performing all the painting necessary to complete this contract in its entirety.

B. It is the intent of these specifications to paint all exposed pipe, fittings, valves, and pumping equipment. Minor items omitted in the schedule of work shall be included in the work of this section when they come within the general intent of the specifications as stated herein. Painting of pump station proper is not required by this section.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Shop priming and surface preparation of equipment and piping are specified in the respective section with the item to be primed.

B. Piping is included in Sections 02615 and 15062.

C. Paint Schedule and Protective Coatings in Section 09800

1.03 QUALITY ASSURANCE

Include on label of containers:

1. Manufacturer's name.
2. Type of paint.
3. Manufacturer's stock number.
4. Color.
5. Instructions for reducing, where applicable.
6. Label analysis.
7. Federal specification number.

1.04 SUBMITTALS

Submit to the Engineer as provided in the General Conditions and Section 01340, shop drawings, manufacturer's specifications, and printed technical data on the proposed paint systems and detailed surface preparation, application procedures and dry film thickness.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Delivery of Materials

1. Deliver sealed containers with labels legible and intact and with batch codes indicating when the coating was manufactured.
2. Deliver to project site or segregate at source of supply in advance of need so as to allow 15 days for testing.

B. Storage Materials

1. Store only acceptable project materials on project site.
2. Store in a suitable location.
3. Restrict storage to paint materials and related equipment.
4. Comply with health and fire regulations.
5. No paint shall be stored on site or applied which exceeds the product shelf life at time of application.

1.06 JOB CONDITIONS

A. Environmental Requirements

1. Comply with manufacturer's recommendations as to environmental conditions under which coating systems can be applied.
2. Do not apply finish in areas where dust is being generated.

B. Protection

Cover or otherwise protect finished work of other trades or surfaces not being painted concurrently or not to be painted.

PART 2 - PRODUCTS

2.01 MATERIALS

A. All painting materials shall be fully the equal to those manufactured by the Tnemec Co. or Koppers Company, Inc. or approved equal. No brand other than those named will be considered for approval unless the brand and type of paint proposed for each item in the following schedule, together with sufficient data substantiated by certified tests conducted at no expense to the Owner, to demonstrate its equality to the paint(s) named, is submitted in writing to the Engineer for approval within 30 days after the signing of the Notice to Proceed. The type and number of tests performed shall be subject to the Engineer's approval. Minimum standards for testing shall be in accordance with the applicable test methods of the American Society for Testing Material (ASTM) and Federal Standard No. 141 or other approved methods when not covered by the preceding.

B. All painting materials shall be delivered in unbroken packages bearing the manufacturer's brand and name. They shall be used without adulteration and mixed, thinned, and applied in strict accordance with manufacturer's directions for the applicable materials and surface and with the Engineer's approval before using.

C. Shop priming shall be done with primers that are guaranteed by the manufacturer to be compatible with the finish paints to be used.

D. No paint containing lead will be allowed. Oil shall be pure boiled linseed oil. All thinners used from the coating manufacturer.

E. All recommendations of the paint manufacturer in regard to the health and safety of workers shall be followed.

F. All pipe support floor stands shall be painted.

2.02 FABRICATED EQUIPMENT

A. Unless otherwise indicated below, all fabricated equipment shall be shop primed and shop or field finished.

B. All items to be shop primed shall be thoroughly cleaned of all loose material prior to priming. If, in the opinion of the Engineer, any prime coating shall have been improperly applied or if material contrary to these specifications shall have been used, that coating shall be removed by sandblasting to white metal and reprimed in accordance with these specifications.

C. All shop prime coats shall be of the correct materials and applied in accordance with these specifications. The Contractor shall remove any prime coats not in accordance with these specifications by sand-blasting and apply the specified prime coat at no additional cost to the Owner.

D. Shop primed surfaces shall be cleaned thoroughly and retouched with the specified primer before the application of successive paint coats in the field.

E. Shop finish coats may be the standard finish as ordinarily applied by the manufacturer when approved by the Engineer.

F. The Contractor shall be responsible for and take whatever steps are necessary to properly protect the shop prime and finish coats against damage from weather or any other cause.

G. If, in the opinion of the Engineer, a shop finish coat does not give the protection quality of other work of similar nature, the Contractor shall apply the coat or coats of paint as directed by the Engineer to accomplish the desired protection quality. The Engineer

may request proof of purchase of specified materials by the Contractor and/or fabricator if the need arises.

2.03 EXTRA PAINT

Furnish one clearly marked unopened gallon can or kit, if coating is a catalized type coating, of each type and each color of paint used.

PART 3 - EXECUTION

3.01 PREPARATION OF SURFACES

A. All surfaces to be painted shall be prepared as specified herein and by the manufacturers recommendations and shall be dry and clean before painting.

B. All metal welds, blisters, and other defects shall be ground and sanded smooth in accordance with SSPC-SP-3 or, in difficult and other-wise inaccessible areas, by hand cleaning in accordance with SSPC-SP-2. All pits and dents shall be filled and all imperfections shall be corrected so as to provide a smooth surface for painting. All rust, loose scale, oil, grease, and dirt shall be removed by use of approved solvents, wire brushing, or sanding.

C. Exposed Pipe: Bituminous coated pipe shall not be used in exposed locations. Pipe which shall be exposed after project completion shall be primed in accordance with the requirements in Section 09800. Any bituminous coated pipe which is inadvertently installed in exposed locations shall be sandblasted clean before priming and painting. After installation of all exterior, exposed flanged joints shall have the gap between adjoining flanges sealed with a single component Thiokol caulking to prevent rust stains.

D. Shop-Finished Surfaces: All shop-coated surfaces shall be protected from damage and corrosion before and after installation by treating damaged areas immediately upon detection. Abraded or corroded spots on shop-coated surfaces shall be "Hand Cleaned" and then touched up with the same materials as the shop coat or as specified by the coating manufacturer. All shop coated surfaces which are faded, discolored, or which require more than minor touchup, in the opinion of the Engineer, shall be repainted.

3.02 PAINTING SYSTEMS

All colors shall be selected and paint schedule shall be as specified in Section 02615, 09800 and 15062.

3.03 WORKMANSHIP

A. General

1. Primer (spot) and paint used for a particular surface shall, in general, be as scheduled for that type of new surface. Confirm with the paint manufacturer that the paint proposed for a particular repaint condition will be compatible with the existing painted surface. Sample repainted areas on the actual site will be required to ensure this compatibility. Finished repainted areas shall be covered by the same guarantee specified for the remainder of work.
2. At the request of the Engineer, samples of the finished work prepared in strict accordance with these specifications shall be furnished and all painting shall be equal in quality to the approved samples. Finished areas shall be adequate for the purpose of determining the quality of workmanship. Experimentation with color tints shall be furnished to the satisfaction of the Engineer where standard chart colors are not satisfactory.
3. On metal surfaces, apply each coat of paint at the rate specified by the manufacturer to achieve the minimum dry mill thickness required. If material has thickened or must be diluted for application by spray gun, the coating shall be built up to the same film thickness achieved with undiluted material. One gallon of paint, as originally furnished by the manufacturer, shall not cover a greater area when applied by spray gun than when applied unthinned by brush. Deficiencies in film thickness shall be corrected by the application of an additional coat(s).
4. Paints shall be mixed in proper containers of adequate capacity. All paints shall be thoroughly stirred before use and shall be kept stirred while using. No unauthorized thinners or other materials shall be added to any paint.

B. Field Priming

1. Steel members, metal castings, mechanical and electrical equipment, and other metals which are shop primed before delivery at the site, will not require a prime coat on the job, provided the Contractor and/or subcontractor apply only the brand and type of coating specified in 09800 and as the "Standard of Quality" for the total coating system applied. All piping and other bare metals to be painted shall receive one (1) coat of primer before exposure to the weather, and this prime coat shall be the first coat as specified in the painting schedule.
2. Surfaces that have been shop painted and have been damaged, or where the shop coats or coats of paint have deteriorated, shall be properly cleaned and retouched before any successive painting is done on them in the field. All such field painting shall match as nearly as possible the original finish.

C. Field Painting

1. All painting at the site shall be designated as Field Painting and shall be under the direct and complete control of the Engineer, and only skilled painters and specialists, where required, shall be used on the work.
2. All paint shall be at 70F before applying, and painting shall be done when the air

and surface temperatures are between 60-100F for epoxies, 50-100F for acrylic emulsions and 32-100F for all other coating systems applied. Unless coating manufacturer's technical information states otherwise, no paint shall be applied unless the surface and air temperature is 5 degrees above the dew point.

3. Successive coats of paint shall be tinted so as to make each coat easily distinguishable from each other with the final undercoat tinted to the approximate shade of the finished coat.
4. Finish surfaces shall not show brush marks or other irregularities. Undercoats shall be thoroughly and uniformly sanded with No. 00 sandpaper or equal to remove defects and provide a smooth even surface. Top and bottom edges of doors shall be painted and all exterior trim shall be back-primed before installation.
5. Painting shall be continuous and shall be accomplished in an orderly manner so as to facilitate inspection.
6. All materials shall be brush painted unless spray painting is specifically approved by the Engineer.
7. All surfaces to be painted, as well as the atmosphere in which painting is to be done, shall be kept warm and dry by heating and ventilation, if necessary, until each coat of paint has hardened. Any defective paint shall be scraped off and repainted in accordance with the Engineer's directions.
8. Before final acceptance of the work, all damaged surfaces of paint shall be cleaned and repainted as directed by the Engineer, Owner and/or Testing Laboratory.
9. Valves and fittings shall be painted the same color as the pipe.
10. It shall be the responsibility of the coating manufacturer's representative to provide on site technical assistance to the Engineer and Contractor and to report his findings from the on-site inspection as to surface preparation, application procedures, and dry film thickness to the Engineer on a timely basis unless deemed unnecessary by the Engineer.

3.04 CLEANUP

A. The premises shall at all times be kept free from accumulation of waste material and rubbish caused by employees or work. At the completion of the painting, remove all tools, surplus materials, and all rubbish from and about the site.

B. Upon completion, remove all paint where it has been spilled, splashed, or splattered on floors, fixtures, equipment, and all other surfaces, leaving the work ready for inspection.

END OF SECTION

SECTION 09905
CONCRETE LINING
(WET WELLS)

PART 1--GENERAL

1.01 DESCRIPTION:

A. This section covers all workmanship, materials and quality requirements for rehabilitation and lining work on the interior surfaces of wetwells. Provide and apply resurfacing and epoxy lining materials as specified and as indicated on drawings and per Manufacturer' instructions design details.

1.02 RELATED WORK:

A. Division 1 – General Requirements
B. Section 01300 – Submittals

1.03 REFERENCES:

A. This section contains references to the documents listed below. They are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the more stringent of the requirements shall prevail.

B. Unless otherwise specified, references to documents shall mean the documents in effect at the time of receipt of Bids. If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, whether or not the document has been superseded by a version with a later date, discontinued, or replaced.

C. Referenced publications found within this specification shall be the latest revision unless otherwise specified; and applicable parts of the referenced publications shall become a part of this specification as if fully included.

Reference	Title
ASTM (American Society for Testing and Materials)	

Reference	Title
ASTM C 920	Specification for Elastomeric Joint Sealants.
ASTM D 3960	Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings
ASTM D 4259	Practice for Abrading Concrete.
ASTM E 337	Standard Practice Test Method for Measuring Humidity with a Psychrometer.
ASTM F 710	Practice for Preparing Concrete Floors and Other Monolithic Surfaces to Receive Resilient Flooring
FEDERAL STANDARD COLORS	
F 595 B	Federal Standard Colors
Guideline No. 03732	Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays
ICRI (International Concrete Restoration Institute)	
Guideline No. 03732 Guideline No. 03732	Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays
NACE (National Association of Corrosion Engineers)	
NACE Publication 6D-173	"A Manual for Painter Safety"
NACE Publication 6G-164	"Surface Preparation Abrasives for Industrial Maintenance Painting"
NACE Publication 6G-164	"Surface Preparation Abrasives for Industrial Maintenance Painting"
NACE Publication TPC2	Coatings and Linings for Immersion Service: Chapter 1 Safety, Chapter Surface Preparation, Chapter 3 Curing, and Chapter 4 Inspection
NACE Publication 6F-163	"Surface Preparation of Steel or Concrete Tank Interiors."

Reference	Title
NACE RP0892-92	Standard Recommended Practice, Lining over Concrete in Immersion Service.
NACE RP0288-88	Standard Recommended Practice, Inspection of Linings on Steel and Concrete.
SSPC (Steel Structures Painting Council)	
SSPC-SP12	Surface Preparation and Cleaning of Steel and Other Hard Materials by High and Ultrahigh Pressure Water Jetting Prior to Recoating.
SSPC-SP13	Surface Preparation of Concrete
SSPC-PA-3	"A Guide to Safety in Paint Application"
SSPC-Guide 12	Guide for Illumination of Industrial Painting Project.
OSHA (Occupational Safety & Health Administration.)	
1915.35	Standards – 29 CFR – Painting.
ANSI (American National Standards Institute)	
ANSI/ASC 29.4 Exhaust Systems	Abrasive Blasting Operations – Ventilation and Safe Practice

1.04 QUALITY ASSURANCE

A. REQUIREMENTS:

1. Do not use or retain contaminated, outdated, or diluted materials for resurfacing. Do not use materials from previously opened containers.

2. Use only products of the approved Manufacturer. Use products of one manufacturer in any one resurfacing system with compatible materials. Provide same material product for touch-up as for original material.

3. If any requirements of this specification conflict with a referenced standard, the more stringent requirement shall apply.

4. Make available all locations and phases of the work for access by the Engineer or other personnel designated by the Engineer. The Contractor shall provide ventilation and egress to safely access the coating work areas for inspection.

5. Conduct work so that the resurfacing system is installed as specified herein. Inspect work continually to ensure that the resurfacing system is installed as specified herein. The Contractor shall inspect the work to determine conformance with the specifications and referenced documents. The Contractor shall inform the Engineer of the progress and the quality of the work through daily reports as specified below. Any nonconforming coating system work shall be corrected as specified herein or as recommended by the Manufacturer.

6. Summarize test data, work progress, areas covered, ambient conditions, quality control inspection test findings, and other information pertinent to the resurfacing system installation in daily reports to be submitted to the Engineer or the Engineer's Representative.

7. The methods of construction shall be in accordance with all requirements of this specification.

8. Employ only tradespeople who have at least **five years** of experience performing resurfacing work of similar size and complexity as the work specified in this Section. Submittals to verify these qualifications are to be made within thirty (30) days of the Notice-to-Proceed and are subject to approval by the Engineer

9. Included in the bid shall be two letters. One from the shotcrete material manufacturer and one from the epoxy material manufacturer listing five projects the contractor has completed of similar size (or greater) and scope with the specified materials.

1.05 SUBMITTALS

A. Submit the following prior to commencing with any phase of the work covered by this Section:

1. Manufacturer's current printed recommendations and product data sheets for all coating system products supplied under this section including performance criteria, surface preparation and applications, volatile organic compound (V.O.C.) data, and safety requirements.

2. Material Safety Data Sheets (MSDS) for any materials brought on-site including all resurfacing system materials, solvents, and abrasive blast media.

3. Storage requirements including temperature, humidity, and ventilation for resurfacing system materials.

4. Manufacturer's requirements, including application procedures for resurfacing materials shall be in writing and shall be followed in detail. All safety precautions recommended by the Manufacturer shall be strictly adhered to at all times when work is in progress.

5. Color samples for all surfaces to be resurfaced that have been field-matched to existing colors.

6. Submit applicators' certification that resurfacing materials comply with Federal, State, and Local regulations for VOC (Volatile Organic Compounds).

7. Submit daily reports that contain the following information: Substrate conditions, ambient conditions, application procedures, work completed and location thereof. Mark-up drawings that show location of work.

8. Submit letter(s) with associated product data signed by Manufacturer certifying that submitted products are suitable for application on the surfaces to be resurfaced and for the service conditions.

9. Submit resume of project superintendent and tradespeople for approval of engineer.

B. Submit the following information at the completion of the work identified within the scope of this section:

1. Submit daily reports that contain the following information: surface preparation, substrate conditions, ambient conditions, application procedures, coating materials used, coating material quantities, batch numbers of materials used, and work completed and location thereof. Mark-up drawings that show location of work.

1.06 DELIVERY AND STORAGE

A. Materials shall be stored in accordance with Manufacturer's recommendations in enclosed structures and shall be protected from weather and adverse temperature conditions. Flammable materials shall be stored in accordance with state and local codes. Materials exceeding storage life recommended by the manufacturer shall be removed from the site.

B. Store all materials only in area or areas designated by the Engineer solely for this purpose. Confine mixing, thinning, clean-up and associated operations, and storage of materials-related debris before authorized disposal, to these areas. All materials are to be stored on pallets or similar storage/handling skids off the ground in sheltered areas in which the temperature is maintained between 50°F and 90°F.

C. Mix all resurfacing materials in an enclosed mixing area designated by the Engineer. This enclosed area must protect the mixing operation and materials from direct sunlight, inclement weather, freezing, or other means of damage or contamination. Protect all other concrete and metallic surfaces and finishes from any spillage of material(s) within the mixing area.

D. Do not use floor drains, dikes or storm drains for disposal of resurfacing system materials.

E. The Contractor shall take all precautions and implement all measures necessary to avert potential hazards associated with the resurfacing system materials as described on the pertinent Material Safety Data Sheets or container labels.

F. Deliver all materials to the job site in their original, unopened containers. Each container shall bear the Manufacturer's name and label.

1. Labels on all material containers must show the following information:

    a. Name or title of product.
    b. Federal Specification Number if applicable.
    c. Manufacturer's batch number and date of manufacture.
    d. Manufacturer's name.
    e. Generic type of material.
    f. Application and mixing instructions.
    g. Hazardous material identification label.
    h. Shelf life date.
    i. Storage requirements.

2. All containers shall be clearly marked indicating any personnel safety hazards associated with the use of or exposure to the materials.

3. All materials shall be handled and stored to prevent damage or loss of label.

4. Resurfacing material storage and mixing areas shall be designated by the Engineer.

5. Do not use or retain contaminated, outdated, prematurely opened, diluted materials, or materials which have exceeded their shelf life.

1.07 COORDINATION OF WORK

A. WORK AREAS:

The work areas on the job site will be designated by the Engineer. The Contractor's personnel shall not be permitted in any area other than those expressly designated by the Engineer.

B. COORDINATION

The contractor shall coordinate with the Engineer regarding availability of work areas, completion times, safety, access and other factors which can impact plant operations.

1.08 SAFETY

A. The Contractor's work forces should comply with the provisions outlined in the following documents:

SSPC-PA-3 "A Guide to Safety in Paint Application"
NACE Pub. "A Manual for Painter Safety"

B. The Contractor shall provide personnel with all safety equipment necessary to protect them during any phase of the work. This shall include, but not be limited to safety glasses, goggles, earplugs, hard hats, steel toed work shoes, appropriate personal protective clothing, gloves, and plant approved escape respirators (where required).

C. No work shall be performed until the appropriate Work Requests and lock-outs are approved by the Engineer. The Work Request system provides a mechanism to advise plant staff of a contractor's work activities. The Lockout system is a safety procedure to prevent unintended equipment activation.

D. Keep any flammable materials such as cleaning solvents, thinners, or resurfacing materials away from open flames, sparks or temperatures higher than 150°F. Drums containing flammable materials will be grounded. No solvent in any quantity shall be allowed inside containment enclosures or permitted confined spaces at any time during resurfacing work.

E. Power tools are to be in good working order to avoid open sparking. No spark producing tools shall be utilized in restricted areas as indicated herein.

F. The Contractor shall fireproof all work areas by maintaining a clean work area and having Underwriter's Laboratories approved fire extinguishers on-hand. The Contractor shall furnish these fire extinguishers.

G. Workers doing abrasive blasting operations shall wear a fresh air supplied protective helmet and hood and personal protective clothing acceptable to industry standards and all government regulations.

H. Dispose of rags used for wiping up resurfacing materials, solvents, and thinners by drenching them with water and placing in a metal container with a tight fitting metal cover. Complete this disposal process at the end of each day. Final disposal of these materials is the Contractor's responsibility.

I. Matches, smoking, flames, or sparks resulting from any source including welding, must be remote from the work area during coating work. Smoking is permitted only in designated areas of the plant.

1.10 JOB CONDITIONS:

A. Environmental:

1. Air and Surface Temperatures: Prepare surfaces and apply and cure coatings within air and surface temperature range in accordance with Manufacturer's instructions.
2. Surface Temperature: Minimum of 5 degrees F (3 degrees C) above the dew point.
3. Relative Humidity: Prepare surfaces and apply and cure coatings within relative humidity range in accordance with Manufacturer's instructions.
4. Precipitation: Do not prepare surfaces or apply coatings in rain, snow, fog, or mist.
5. Wind: Do not spray coatings if wind velocity causes overspray of the coating materials.

PART 2 -- PRODUCTS

2.01 MANUFACTURERS

A. Materials specified are those that have been evaluated for the specific service. Products of the Tnemec Company, Inc. are listed to establish a standard of quality. Equivalent materials of other manufacturer's may be submitted on written approval of the Engineer.

2.02 MATERIALS

A. Concrete Lining System for New Construction and Minor Rehabilitation (Concrete Deterioration less than 1/2")

1. Materials specified herein are the only approved standard coating systems unless an "or equal" is approved in writing by the Engineer.

OPTION 1:

Skim Coat	No. 218-1000 Mortarclad or SW Dura Plate 2300 (B58A320)	(1/16-1/2"") Carboguard 510
1 Coat	No. 434 Permashield or SW Dura Plate 5900 Mortar (B62W465)	(125 DFM) Broadcast Semstone 140
1 Coat	No. 435 Permaglaze or SW Dura Plate 5900 (B62W465)	(15 DFM) Semstone 140

OPTION 2:

Skim Coat	No. 218-1000 Mortardad or SW Dara Plate 2300 (B58A320)	(1/16-1/2")
Primer	SS Moisture Barrier	(60-80 DFM)
Surfacer	SS Rigid Polyurethane	(3/8" beyond original grade)
Topcoat	SS Topcoate	(60-80 FM)

B Concrete Lining System for Moderate to Severe Rehabilitation (Concrete Deterioration greater than 1/2")

OPTION 1:

Concrete Rebuild	No. 217 MortarCrete or AW Cook MSM Mortar	(flush with original grade, minimum ¼" thickness) Carboguard 510
1 Coat	No. 434 Permashield or SW Dura Plate 5900 Mortar (B62W465)	(125 DFM) Broadcast Semstone 140
1 Coat	No. 435 Permaglaze or SW Dura Plate 5900 (B62W645)	(15 DFM) Semstone 140

OPTION 2:

Concrete Rebuild	SIkacem 103, Emmaco S88	(flush with original grade, minimum 3/8" thickness)
Primer	SS Moisture Barrier	(60-80 DFM)
Surfacer	SS Rigid Polyurethane	(3/8" beyond original grade)
Topcoat	SS Topcoate	(125-140 DFM)

OPTION 3:

Concrete Rebuild	Xypex Mega Mix II with Bio San	(flush with original grade, minimum 1/2" thickness
Primer	N/A	N/A
Surfacer	N/A	N/A
Topcoat	N/A	N/A

PART 3--EXECUTION

3.01 GENERAL

A. HOISTING, SCAFFOLDING, STAGING, AND PLANKING:

1. Provide, set-up, and maintain all required hoists, scaffolds, and staging and planking, and perform all access related hoisting work required to complete the work of this section as indicated and specified.

2. Scaffolds shall have solid backs and floors to prevent dropping materials from there to the floors or ground below.

B. ENVIRONMENTAL REQUIREMENTS:

1. Comply with the Manufacturer's recommendations as to environmental conditions under which materials can be applied.

2. Do not apply materials when dust is in work site.

3. The Contractor shall provide all temporary lighting during the work.

C. PROTECTION:

1. Cover or otherwise protect finish work or other surfaces not being resurfaced.

2. Erect and maintain protective tarps, enclosures and/or maskings to contain debris (such as dust or airborne particles resulting from surface preparation) generated during any and all work activities. This includes, but is not limited to, the use of dust/debris collection apparatus as required.

D. INITIAL INSPECTION OF SURFACES TO BE COATED:

1. It is the responsibility of the Contractor to inspect and report unacceptable concrete substrate surface conditions to the Engineer prior to the commencement of surface preparation activities.

2. Unacceptable concrete surface conditions are defined as the presence of water infiltration/inflow, cracked surfaces or concrete deteriorated to a depth of greater than 1" or otherwise unable to withstand surface preparation as specified herein.

3. Verify that the pH of the cleaned concrete surfaces to be coated is within the range of to 9 to 11. Application of coating materials outside this range will not be permitted without written approval from the ENGINEER.

4. Unacceptable steel or ductile/cast iron surface conditions are defined as severely corroded and/or perforated metals and are unable to withstand surface preparation as specified herein.

E. THINNERS AND SOLVENTS:

1. The Contractor shall use only solvents and thinners as recommended by the Manufacturer.

3.02 SURFACE PREPARATION REQUIREMENTS

A. GENERAL:

1. All specified surface preparation shall be performed in accordance with the latest version of the SSPC, NACE, ICRI and other standards referenced in this section.

2. Allow new concrete to cure a minimum of 28 days. Verify dryness by testing for moisture with a "plastic film tape down test." (Reference ASTM D 4263). If necessary for testing horizontal surfaces, Calcium Chloride test in accordance with ASTM F 1869. If test results indicate moisture levels outside the acceptable range of the manufacturer, contact the manufacturer. Do not proceed with the coating application.

B NEW CONCRETE

1. Abrasive blast all surfaces to be coated to remove existing coatings, loose and deteriorated concrete, laitance, curing compounds sealer and other contaminants and to produce a minimum surface profile equal to ICRI CSP 5. Reference SSPC-SP13. This preparation will be followed by vacuum cleaning to remove all dust, dirt or friable substances leaving clean, dust free surfaces for resurfacing.

C. EXISTING CONCRETE

1. All existing areas that are scheduled to receive the chemical resistant lining shall be steam cleaned with minimum 210°F water with alkaline – based detergent to remove all loose materials, acid constituents, grease, oil, and other contaminants. Oil and grease shall be removed before mechanical cleaning is started.

2. Abrasive blast all surfaces to be coated to remove existing coatings, loose and deteriorated concrete, laitance, curing compounds sealer and other contaminants and to produce a minimum surface profile equal to ICRI CSP 6. Reference SSPC-SP13. This preparation will be followed by vacuum

cleaning to remove all dust, dirt or friable substances leaving clean, dust free surfaces for resurfacing.

3. Identify and stop all active cracks from leaking using either a hydraulic cement or a chemical grout such as DeNeef Flex LV or equivalent from Avanti. The set time of the Hydraulic Cement shall be approximately 1 minute to 90 seconds per ASTM C 403. The compressive strength of the hydraulic cement shall be approximately 1000 psi after 1 hours per ASTM C 109. All products are to be applied in accordance with manufacturer's instructions.

4. Apply shotcrete to all surfaces to be rehabilitated to bring surfaces out to flush and to maintain a minimum thickness of 1/4". The application shall result in a finish that covers all exposed aggregate and results in no surface voids, discontinuities or irregularities. Cure in accordance with manufacturer's instructions and in accordance with ACI 308.1-98. At termination saw cut ½" deep and routed to eliminate feather-edging so that the shotcrete is keyed in properly.

5. All shotcreted surfaces shall be abrasive blasted to remove all laitance from release agents, curing compounds sealers and other contaminants and to produce a minimum surface profile of ICRI CSP 5. This preparation will be followed by vacuum cleaning to remove all dust, dirt or friable substances leaving clean, dust free surfaces for resurfacing. The air used for blast cleaning shall be free of oil and moisture to not cause contamination of the surfaces to be resurfaced.

6. The air used for blast cleaning shall be free of oil and moisture to not cause contamination of the surfaces to be resurfaced.

7. Cleaning and resurfacing shall be scheduled so that dust and other contaminants from the cleaning process will not fall on wet, newly resurfaced areas.

8. Prepare concrete joint and install sealant following resurfacing material installation per Section 07150.

D. INITIAL CLEANING/DECONTAMINATION:

1. All existing areas to be resurfaced shall be pressure washed with alkaline – based detergent to remove all loose materials, acid constituents, grease, oil, and other contaminants.

2. Verify that the pH of the cleaned concrete surfaces to be coated is within the range of 9 to 11. Application of coating materials outside this range will not be permitted without written approval from the Engineer.

E. ABRASIVE BLAST CLEANING

1. Used or spent blast abrasive shall not be reused on work covered by this section.

2. The compressed air used for blast cleaning will be filtered free of condensed water or oil. Moisture traps will be cleaned at least once every four hours or more frequently as is appropriate.

3. Oil separators shall be installed just downstream of compressor discharge valves and at the discharge of the blast pot discharges. Oil separators shall be cleaned at least once every four hours or more frequently as is appropriate.

4. A paper blotter test shall be performed by the Contractor when requested by the Engineer or the Engineer's representative to determine if the air is sufficiently free of oil and moisture.

5. Regulators, gauges, filters, and separators will be in good working order for all of the compressor air lines to blasting nozzles at all times during this work.

6. An air dryer or drying unit shall be installed which dries the compressed air prior to blast connections. This dryer shall be used and maintained for the duration of surface preparation work.

7. The quality, volume, and velocity of life support and ventilation air used during surface preparation shall be in accordance with applicable safety standards and as required to ensure adequate visibility and proper dissipation of volatiles without impacting the prepared surface or the health of the public or personnel working for the Contractor, Subcontractors, Engineer, Engineer's Representatives, or anyone who may be affected by on-site maintenance coating work activities.

8. The abrasive blast nozzles used shall be the venturi or other high velocity type supplied with a minimum of 100 psig air pressure and the necessary volume to obtain the required blast cleaning production rates and specified degree of cleanliness.

9. The Contractor must provide adequate ventilation for airborne particulate evacuation and lighting (meeting all pertinent safety standards) to

optimize visibility for both blast cleaning and observation of the substrate during surface preparation work.

10. All phases of surface preparation work specified herein must be inspected by the Engineer before the Contractor proceeds with the subsequent phase of surface preparation.

11. If between final surface preparation work and coating application, contamination of the prepared and cleaned substrate occurs, or if the prepared steel's appearance darkens or changes color, reblasting will be required until the specified degree of cleanliness is established.

3.03 SPECIFIC SURFACE PREPARATION REQUIREMENTS

A. In addition to the Section 3.02 requirements, the Contractor will follow the requirements of this section.

B. Where the coating is specified to be terminated, the Contractor shall prepare and apply materials as outlined in Tnemec Drawing TLS-02 (included at end of Section).

C. For applications around penetrations and/or drains, the contractor shall prepare and apply coatings as detailed on Tnemec Drawing TLS-01 (included at end of Section).

D. The Contractor shall notify the Engineer should jobsite conditions prevent the above operations and/or applications.

E. Where the coating is specified over control or construction joints, the CONTRACTOR shall prepare and apply coatings as detailed on Tnemec Drawing TLS-04, Termination at Control or Construction Joints for Cracks.

F. Where the coating is specified over expansion joints, the CONTRACTOR shall prepare and apply coatings as detailed on Tnemec Drawing TLS-05, Expansion Joint Treatment Detail.

G. When encountered, the CONTRACTOR shall prepare the surfaces exposing rebar as detailed on Tnemec Drawing TLS-09, Exposed Rebar Repair.

H. The CONTRACTOR shall notify the ENGINEER should jobsite conditions prevent the above operations and/or applications.

3.04 APPLICATION REQUIREMENTS

A. GENERAL:

1. Areas not to be resurfaced shall be masked using duct tape or other protection materials to prevent these surfaces from being resurfaced.

2. Ensure straight even termination of resurfacing/topcoat materials on wall edges and flush with embedded steel.

3. The Contractor must follow the minimum and maximum recoat limitation times and related temperature range restrictions between successive lifts for all products specified herein per Manufacturer's stated requirements.

4. All equipment and procedures used for resurfacing system application shall be as recommended by the Manufacturer.

5. Unless specified elsewhere herein, the Contractor shall comply with the Manufacturer's most recent written instructions with respect to the following:

   a. Mixing of All Materials.
   b. Protection and Handling of All Materials.
   c. Recoat Limitation and Cure Times.
   d. Minimum Ambient and Substrate Temperatures, Substrate's Degree of Dryness, Relative Humidity, and Dew Point of Air.
   e. Application.
   f. Final Curing.
   g. Use of Proper Application Equipment.

6. Curing of Resurfacing System:

   The applied resurfacing system shall be protected from damage during curing and shall be cured as recommended by the Manufacturer. Ambient conditions shall be controlled by the Contractor during curing to ensure the minimum air temperature and minimum relative humidity as required by the Manufacturer is maintained.

C. CHEMICAL RESISTANT LINING

1. General Note: The Contractor is advised that with all thick-film, quick curing materials applied to concrete surfaces, outgassing of the concrete can occur. Possible remedies include applying materials when the temperature of the concrete surfaces are descending, or applying a thin (1/8") layer of the specified surfacing material. Other remedies may exist, and may be submitted for the Engineer's approval.

D. SAFETY AND VENTILATION REQUIREMENTS:

1. Requirements for safety and ventilation shall be in accordance with SSPC Paint Application Guide No. 3.

3.05 FIELD QUALITY CONTROL INSPECTION AND TESTING

A. Inspection by the Engineer or others does not limit the Contractor's responsibilities for quality control inspection and testing as specified herein or as required by the Manufacturer's instructions.

B. Perform the quality control procedures listed below in conjunction with the requirements of this Section.

1. Inspect all materials upon receipt to ensure that all are supplied by the Manufacturer.

2. Provide specified storage conditions for the resurfacing system materials, solvents, and abrasives.

3. Inspect and record findings for the degree of cleanliness of substrates using. The pH of the concrete substrate will be measured using pH indicating papers. pH testing is to be performed once every 50 sq. ft. Acceptable pH values shall be between 9.0 and 11.0 as measured by a full-range (1-12) color indicating pH paper with readable color calibrations and a scale at whole numbers (minimum). Use Hydrion Insta-Check Jumbo 0-13 or 1-12 or equal. The paper shall be touched to the surface once using moderate gloved finger pressure. The surface shall not be wiped or moved laterally to disturb the surface during pH testing. Following the one touch, lift the paper vertically to not "wipe" the surface. Compare the color indicated with the scale provided and record the pH.

4. Inspect and record substrate profile (anchor pattern). Surfaces shall be abraded, as a minimum, equal to the roughness of 40 grit sand paper.

5. Measure and record ambient air temperature once every two hours of each shift using a thermometer and measure and record substrate temperature once every two hours using a surface thermometer.

6. Measure and record relative humidity every two hours of each shift using a sling psychrometer in accordance with ASTM E337.

7. Provide correct mixing of resurfacing materials in accordance with the Manufacturer's instructions.

8. Inspect and record that the "pot life" of resurfacing materials are not exceeded during installation.

9. Verify curing of the resurfacing materials in accordance with the Manufacturer's instructions.

10. Upon full cure, the installed protective lining system shall be checked by high voltage spark detection in accordance with NACE RP0188-90 to verify a pinhole-free surface. Voltage shall be set at 11,000 volts. Areas which do not pass the spark detection test shall be corrected at no cost to the Owner and rechecked. High voltage spark detection shall be conducted on the chemical resistant mortar before the installation of the gel coat.

11. Upon completion of the lining system installation the lined area shall be cleaned and prepared to permit close visual inspection by the Engineer or the Engineer's Representative. Any and all deficiencies or defective work (not in compliance with this section or related sections) will be marked for repair or removal/replacement by the Contractor at no additional cost to the Owner.

3.07 ACCEPTANCE CRITERIA

A. ACCEPANCE CRITERIA FOR SURFACE PREPARATION WORK:

All surfaces shall be prepared in accordance with the specification and referenced standards therein.

B. Acceptance Criteria for Coating System Application Work

1. Acceptable coating work will be based upon the following:

   a. No pock-marks, trowel marks, depressions, unconsolidated areas waviness or ridges, pinholes or holidays in either size or frequency.
   b. No intercoat bond failures between lifts.
   c. Proper curing of coatings.

2. Resurfaced areas shall pitch to drains.

3. There shall be no areas that puddle when flood tested.

4. The Engineer or Engineer's Representative shall, at their discretion, inspect the following:

   a. Profile and degree of cleanliness of substrate.
   b. Thickness of materials/coverage rate confirmation.

c. Ambient temperature and humidity requirements and substrate temperature.
d. Curing and recoat times.
e. Proper curing of the resurfacing materials.

5. Rework required on any holidays or any other inadequacies found by the Engineer or the Engineer's representative in the quality of the coating work shall be marked. Such areas shall be recleaned and reworked by the Contractor according to these specifications and the manufacturer's recommendations at no additional cost to the Owner.

6. The Contractor is responsible for keeping the Engineer informed of all progress so that inspection for quality can be achieved.

7. The Contractor is ultimately responsible for the quality performance of the applied materials and workmanship. Inspections by the Engineer or the Engineer's Representative do not limit this responsibility.

3.08 FINAL INSPECTION

A. Perform a final inspection to determine whether the resurfacing system work meets the requirements of the specifications. The Engineer and the Engineer's Representative will conduct final inspection with the Contractor.

3.09 CLEANUP

A. Upon completion of work, the Contractor shall remove surplus materials, equipment, protective coverings, and accumulated rubbish, and thoroughly clean all surfaces and repair any work-related damage. The surrounding surface areas including roadways and all other surfaces shall be restored to their pre-project condition.

END OF SECTION

SECTION 11310

SELF-PRIMING WASTEWATER PUMPS
(Post Oak Lift Station)

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required and install two (2) self-priming, horizontal, centrifugal, v-belt driven sewage pumping units equipped complete, as shown on the Drawings and as specified herein including pumps, motors, variable speed controllers and appurtenances.

B. All necessary and desirable accessory equipment and auxiliaries whether specifically mentioned in this Section or not shall be furnished and installed as required for an installation incorporating the highest standards for this type of service. Also included shall be supervisory services during installation and field testing of each unit and instructing the regular operating personnel in the proper care, operation and maintenance of the equipment.

C. The Contractor shall require the pump manufacturer and motor manufacturer to coordinate his/her design with the supplier of the variable frequency drives.

1.02 RELATED WORK

A. Electrical work, motor, and variable frequency drive specifications are included in Division 16. Pump manufacturer shall certify that equipment furnished will operate with variable frequency drive system supplied.

1.03 SUBMITTALS

A. Submit to the Engineer, in accordance with Section 01340, shop drawings and product data. Submittals shall include the following:

1. Certified dimensional drawings of each item of equipment and auxiliary apparatus to be furnished.

2. Certified foundation, pump support and anchor bolt plans and details.

3. Schematic electrical wiring diagram and other data as required for complete pump installation.

4. Literature and drawings describing the equipment in sufficient detail, including parts list and materials of construction, to indicate full conformance with the detail specifications.

5. Show capacities of equipment and dimensional data for equipment.

6. Show flow and head characteristics, suction lift requirements, motor horsepower, design
capacity, design TDH, and maximum repriming lift.

7. Show dimensions of shelter and layout of shelter and all appurtenance equipment.

8. Total weight of pumping unit.
9. A statement of guarantee that the critical speed analyses as required under Paragraph 1.05.E below have been completed and that the specified limitations will be met.

B. Design Data

1. Manufacturer's certified rating curves, to satisfy the specified design conditions, showing pump characteristics of discharge, head, brake horsepower, efficiency and guaranteed net positive suction head required (NPSHR). Variable speed curves shall be provided showing at least five speeds plotted equally from maximum rpm to minimum rpm. Minimum rpm shall be no less than that required to obtain minimum flow. Curves shall show the full-recommended range of performance and include shut-off head. This information shall be prepared specifically for the pump proposed. Catalog sheets showing a family of curves will not be acceptable.

C. Test Reports

1. Tabulated data for the drive motors including rated horsepower, full load rpm, power factor and efficiency curves at 1/2, 3/4 and full load, service factor and kW input, including when the pump is at its design point. Submit a certified statement from the motor manufacturer that the motors are capable of continuous operation on the power supply from the variable frequency drives to be furnished without affecting their design life for bearings or windings.

2. A schedule of the date of shop testing and delivery of the equipment to the job site.

3. Description of pump factory test procedures and equipment.

4. A statement that the pump will function properly as installed with respect to the suction-piping layout as shown on the Drawings.

D. Operation and Maintenance Data

1. Complete operating and maintenance instructions shall be furnished for all equipment included under this Section as provided in Section 01650. The

maintenance instructions shall include troubleshooting data and full preventative maintenance schedules and complete spare parts lists with ordering information.

1.04 REFERENCE STANDARDS

A. Design, manufacturing and assembly of elements of the equipment herein specified shall be in accordance with, but not limited to, published standards of the following, as applicable:

1. American Gear Manufacturers Association (AGMA)
2. American Institute of Steel Construction (AISC)
3. American Iron and Steel Institute (AISI)
4. American Society of Mechanical Engineers (ASME)
5. American National Standards Institute (ANSI)
6. American Society for Testing and Materials (ASTM)
7. American Welding Society (AWS)
8. American Bearing Manufacturers Association (ABMA)
9. Hydraulic Institute Standards (HI)
10. Institute of Electrical and Electronics Engineers (IEEE)
11. National Electrical Code (NEC)
12. National Electrical Manufacturers Association (NEMA)
13. Occupational Safety and Health Administration (OSHA)
14. The Society for Protective Coatings (SSPC)
15. Underwriters Laboratories (UL)

B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

A. To assure unity of responsibility, the motors, and variable speed drives, and pumping rate control system shall be furnished and coordinated by the pump manufacturer. The

Contractor and manufacturer shall assume responsibility for the satisfactory installation and operation of the entire pumping system including pumps, motors variable speed drives and controls as specified.

B. The equipment specified herein is intended to be standard pumping equipment of proven ability as manufactured by concerns having extensive experience in the production of such equipment. A single manufacturer shall furnish units specified herein. The equipment furnished shall be designed, constructed and installed to operate satisfactorily when installed as shown on the Drawings.

C. Pumps shall be manufactured in accordance with the Hydraulic Institute Standards, except where otherwise specified herein.

D. The pump manufacturer shall be fully responsible for the design, arrangement, and operation of all connected rotating components, including soleplate(s), if any, of the assembled pumping unit mounted on a fabricated steel base plate, to ensure that neither harmful nor damaging vibrations occur at any speed within the specified operating range.

E. Pumps shall operate without vibration over the 60% to 100% speed range. The pump manufacturer shall perform both lateral and torsional critical speed analyses to identify and ensure that (a) the first lateral critical speed shall be at least 25 percent above the maximum pump speed, and that (b) no torsional natural frequencies occur within a range extending from 25 percent below to 25 percent above the specified operating speed range and that (c) any blade excited resonant frequency shall be no closer than plus or minus 25 percent of the natural frequency of any part of the installed assembled pumping unit. Prior to manufacture, a statement shall be forwarded to the Engineer indicating that the required analyses have been made and that the specified limitations will be met.

F. Vibration, when measured in the direction of maximum amplitude on the top of the pumps and the top of the motor bearing housing, shall not exceed the peak to peak displacement and maximum peak velocity level listed in the Hydraulic Institute Standards (current edition), at any speed within the specified operating speed range.

1.06 SYSTEM DESCRIPTION

A. Each of the pumping units will take suction from the wet well.

B. Each pumping unit will start, change speeds, and stop in accordance with pre-set control program as shown on the Drawings and as specified herein. A rotary selection switch can select any pump to be the lead pump with the other units following in numerical order with the fourth pump on standby.

1.07 DELIVERY, STORAGE AND HANDLING

A. All parts shall be properly protected so that no damage or deterioration will occur during a prolonged delay from the time of shipment until installation is completed and the unit and equipment are ready for operation.

B. All equipment and parts must be properly protected against any damage during shipment. Store equipment in accordance with the manufacturer's instruction.

C. Factory assembled parts and components shall not be dismantled for shipment unless permission is received in writing from the Engineer.

D. The finished surfaces of all exposed flanges shall be protected by wooden or equivalent blank flanges, strongly built and securely bolted thereto.

E. Finished iron or steel surfaces not painted shall be properly protected to prevent rust and corrosion.

F. No shipment shall be made until approved by the Engineer in writing.

1.08 MAINTENANCE

A. Furnish all special tools and test equipment required for the proper servicing of all equipment as specified in Section 01650. All such tools and test equipment shall be furnished in a suitable steel tool chest complete with lock and duplicate keys.

B. All spare parts shall be properly protected for long periods of storage and packed in containers that are clearly identified with indelible markings as to contents.

1.09 WARRANTY

A. The equipment shall be warranted for a period of 1 year from date of substantial completion as defined under the General Conditions, Division 0, to be free from defects in workmanship, design or material. If the equipment should fail during the warranty period due to a defective part(s), it shall be replaced in the machine and the unit(s) restored to service at no additional cost to the Owner.

PART 2 PRODUCTS

2.01 GENERAL

A. The pumping units shall all be supplied by one manufacturer and shall be complete including pumps, motors, controls and appurtenances such as, but not limited to, couplings, guards and gauges.

B. The pumps, motors, drives and controls shall be designed and built for 24-hour continuous service at any and all points within the required range of operation, without overheating, without cavitation, and without excessive vibration or strain. All parts shall be so designed and proportioned as to have liberal strength, stability and stiffness and to be especially constructed to meet the specified requirements. Ample room and facilities shall be provided for inspection, repairs and adjustment.

C. All necessary foundation bolts, nuts and washers shall be furnished and shall be Type 316 stainless steel and supplied by the contractor.

D. Each major piece of equipment shall be furnished with a stainless steel nameplate (with embossed data) securely mounted to the body of the equipment. As a minimum, the nameplate for the pumps shall include the manufacturer's name and model number, serial number, rated flow capacity, head, speed and all other pertinent data. As a minimum, nameplates for motors shall include the manufacturer's name and model number, serial number, horsepower, speed, input voltage, amps, number of cycles and power and service factors. Nameplate information for the variable frequency drives shall include the manufacturer's name and serial number, input speed, voltage, current and frequency and horsepower at full load.

2.02 CONDITIONS OF OPERATION

A. The pumps shall be Gorman Rupp, All Prime or equal. The pumps within each service type shall be identical in every respect with all parts interchangeable.

B. Each pump shall be designed for the conditions of service tabulated as follows and shall operate within the system head curves as appended.

Table 2.02
Post Oak Lift Station

No. of pumps:	2
Liquid:	Wastewater
Maximum Temperature (degree F):	110
Maximum speed (rpm):	1,750
Minimum shut-off head at max speed (ft):	30
Average Daily Flow (ADF) Design capacity (gpm):	180
ADF Design total head (TH) (ft):	55
Minimum efficiency at ADF design point (percent):	40%
Maximum sphere solid size (in):	2 1/2
NPSHR at maximum run out capacity (ft):	4.9
Non-overloaded motor HP:	10
Minimum pump casing suction diameter (in):	3
Minimum pump casing discharge diameter (in):	3

C. Where total head (TH) is referred to in conjunction with the specified discharge requirements, it shall be understood to consist of the sum of the pressure head plus the

velocity head, in feet, at the discharge nozzle of the pump minus the pressure head and the velocity head at the suction nozzle of the pump. The efficiency of the pump shall be understood to be based upon total head as just defined.

F. The pumps shall operate throughout the entire operating range, within the vibration limits specified in Paragraph 1.05.F above.

G. Flow separation at the inlet of impeller shall not be permitted when it could result in damage to the impeller. Obvious, excessive hydraulic noise that is characteristic of flow separation shall be deemed as evidence that flow separation is occurring at the level that will cause damage.

2.03 PUMP COMPONENTS

A. Each pump shall be equipped with a removable cover plate, allowing access for service and repairs without removing suction or discharge piping.

B. All areas of the pump casing and volute which are exposed to sewage shall be constructed of cast iron of no lesser grade than Class 30.

C. Each pump shall be fitted with a replaceable wear plate. Replacement of the wear plate, impeller, seal, and suction check valve shall be accomplished without removing the pump volute or piping.

D. Each pump shall incorporate a suction valve that can be removed or installed through the removable cover plate opening, without disturbing the suction piping. Sole function of check valve shall be to eliminate re-priming with each cycle. Pumps requiring suction check valves to prime or reprime will not be acceptable.

E. Means shall be provided for external adjustment of the clearance between the impeller and wear plate. The entire rotating assembly shall move as one unit to enable the clearances to be adjusted. Clearance adjustment by means of moving the shaft, thereby affecting the seal, shall not be acceptable.

F. Each impeller shall be two-vaned, semi-open, non-clog, cast in ductile iron with integral pump out vanes on the back shroud. Impeller shall thread onto the pump shaft and be secured with a lockscrew.

G. Each pump shaft shall be sealed against leakage by a mechanical seal. Both the stationary sealing member and mated rotating member shall be of tungsten titanium carbide alloy. Each of the mated surfaces shall be layed to a flatness of one-half light band (5.8 millionths of an inch), as measured by the optical flat under monochromatic light. The stationary seal seat shall be double floating so that faces will not lose alignment during periods of shock loads that will cause deflection, vibration, and axial movement of the pump shaft.
The seal shall be lubricated with oil from a separate, oil-filled reservoir. The same oil shall not be used to lubricate both the shaft seal and shaft bearings.

H. The pump shaft bearings shall be anti-friction ball or tapered roller bearings, of ample size and proper design to withstand all radial and thrust loads which can reasonably be expected during normal operation. Bearings shall be lubricated form a separate reservoir. Pump designs in which the same oil lubricates both the shaft bearings and the shaft seal shall not be acceptable.

Table 2.03
Post Oak Lift Station

Minimum Pump Weight (lbs.)	400
Impeller dia. (in)	8.0 MAX.
Minimum Sphere Size (in.)	2 ½
Discharge Size (in.)	3.0
Suction Size (in.)	3.0

2.04 PUMP DRIVE SYSTEM

A. Each pump shall be driven by a horizontal electric motor with a maximum horsepower and speed as specified under Paragraph 2.02B above and with TEFC enclosure, refined balance, 50 degree C ambient, winding temperature detectors, and shall meet all the requirements of Section 16100. Each motor shall be in current NEMA design cast iron frame with copper windings.

B. Power shall be transmitted from motors to pumps by means of V-Belt drive assemblies. The drive assemblies must be selected to establish proper pump speed to meet the specified operating conditions.

Each drive assembly shall have a minimum of two V-belts. In no case will a single belt drive be acceptable. Each V-belt drive assembly shall be selected on the basis that adequate power will be transmitted from drive manufacturer.

C. Pump drive transmissions shall be enclosed on all sides in a guard constructed of any one of combination of materials consisting of expanded openings shall not exceed ½ inch.

Guards shall be manufactured to permit complete removal from the pump unit without interference with any unit component, and shall be securely fastened to the unit base and rigidly braced to some fixed part.

All metal shall be free from burrs and sharp edges. Structural joints shall be continuously welded. Panels may be riveted to frames with not more than five-inch spacing. Tack welds shall not exceed a four-inch spacing.

D. The pump motors shall be suitable for driving the pumps continuously over the entire pumping range. The pump motors shall be furnished by the pump manufacturer. The motors shall be constructed and guaranteed to withstand runaway reverse speed equal to 120 percent of forward synchronous speed.

2.05 DESCRIPTION OF SYSTEM OPERATION

A. Constant Speed Pumping System (Post Oak Lift Station)

1. Furnish an automatic sewage lift station control panel to provide un-attended automatic operation of two pumps. The controller shall be completely assembled, wired and tested by a manufacturer meeting Underwriters Laboratories (U.L.) standard, section 508, for enclosed industrial control panels, and provide evidence of such by use of a serial number affixed to the control panel indicating compliance with U.L. standards.

2. The control panel shall be enclosed in a stainless steel Nema 4X weather proof enclosure with an inner safety door to isolate all power components and protect the operator. A locking hasp shall be provided on the exterior of the enclosure. There shall be a main non fuse disconnect provided to remove all power from the components for ease of testing, repair and maintenance. The pump shall be provided with a circuit breaker and a magnetic starter with a Class 10 ambient compensated overload relay. HOA selectors and run lights shall be provided for the pump. A terminal strip shall be provided to connect all float switches and remote pilot devices. Provide all auxiliary components wiring and conduit (including a 20 amp breaker) as necessary to install separate telemetry panel. All pilot devices shall be mounted on the inner door. All power and control devices shall be mounted behind the inner safety door on a painted white steel sub-panel using stainless steel machine screws. Self tapping screws will not be acceptable.

3. Based on wetwell level, float switches shall be used for the present simplex operation of the lift station pumps. The lower switch shall turn off the pumps and the upper switches shall start the pump. A third switch shall activate a high level alarm light mounted on the enclosure, and shall start the back-up pump. A fourth switch shall be provided for low water level alarm.

a. As liquid level rises in the wetwell, it shall close the lower "stop" float switch and enable the pumps to run when called for. As level continues to rise, it shall close the "start lead" float switch, causing the lead pump to run. The pump shall run until the wet well level recedes to the lower float switch and cause the pump to stop.

b. If level continues to rise past lead pump "start" float switch, it shall cause the 2nd pump "run" float switch to activate the second “lag” pump. If the level continues to rise the “High level” float switch shall activate an audible and visual alarm.

c. The pumps shall automatically alternate cycles.

2.06 MISCELLANEOUS

A. Finish

Each piece of equipment in the pumping system including pump, motor and gear shall be prepared shop-primed as specified in Division 9. The shop primer shall be compatible with the finished paint. Field painting is included in Division 9.

B. Air Release Valves

Each pump shall be equipped with one automatic air release valve, designed to permit the escape of air to the atmosphere during initial priming or unattended repriming cycles. Upon completion of the priming or repriming cycles, the valve shall close to prevent recirculation. Valves shall provide visible indication of valve closure, and shall operate solely on discharge pressure. Valves which require connection to the suction line shall not be acceptable.

All valve parts exposed to sewage shall be constructed of cast iron, stainless steel, or similar corrosive resistant materials. Diaphragms, if used, shall be fabric - reinforced neoprene or similar inert material. A clean out port, 3 inches larger in diameter, shall be provided for ease of inspection, clean out, and service. Valves shall be field adjustable for varying discharge heads.

PART 3 EXECUTION

3.01 PREPARATION

A. Coordinate with other trades, equipment and systems to the fullest extent possible.

B. Take all necessary measurements in the field to determine the exact dimensions for all work and the required sizes of all equipment under this Contract. All pertinent data and dimensions shall be verified.

3.02 INSTALLATION

A. Installation shall be in strict accordance with the manufacturer's instructions and recommendations in the locations shown on the Drawings. Anchor bolts shall be set in accordance with the manufacturer's recommendations and setting plans.

B. The pump manufacturer shall supply the services of a factory representative to check over the completed pump installation to the satisfaction of the Engineer. If the Contractor does not have a qualified engineer and/or serviceman on the job during the installation, the Engineer may direct him/her to provide the services of a factory representative to give the necessary instructions to ensure a proper installation.

C. Connection of piping to pumps shall be done in presence of the Engineer. All piping connections to the pump shall be done without bending and/or twisting the piping to mate with the pump flange connections.

D. A certificate from each equipment manufacturer shall be submitted stating that the installation of his/her equipment is satisfactory, that the equipment is ready for operation and that the operating personnel have been suitably instructed in the operation, lubrication and care of each unit.

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

SECTION 11312
SUBMERSIBLE WASTEWATER PUMPS
(FAUBOURG LIFT STATION)

PART 1 - GENERAL

1.01 GENERAL

A. Contractor shall furnish all labor, materials, equipment and incidentals required and install, place in operation, and field test three (3) explosion-proof non-clog submersible centrifugal sewage pumps including guide rails, control panel and appurtenances for NEC Class 1, Division 1, Group C,D hazardous locations as specified herein and shown on Drawings.

B. Each pump shall be equipped with stainless steel nameplate, stating the unit is accepted for use in NEC Class 1, Division 1, Group C, D hazardous locations with third party, Factory Mutual approval. The nameplate shall also include manufacturer, serial number, rated capacity, TDH, speed, and all other pertinent data.

1.02 QUALIFICATIONS

A. To assure unit responsibility, the pumps, motors, hatches, guide rails, and anchor bolts and other auxiliary equipment, and materials specified in this Section shall be furnished and coordinated by the pump manufacturer. The Contractor and manufacturer shall assume responsibility for the satisfactory installation and operation of the entire pumping system including pumps, motors, and controls as specified.

B. The pumps covered by the Specifications are intended to be standard pumping equipment of proven ability as manufactured by a reputable manufacturer having long experience in the production of such pumps. The pumps furnished shall be designed constructed and installed in accordance with the best practice and methods, and shall operate satisfactorily when installed. Pumps shall be manufactured in accordance with the Hydraulic Institute Standards.

C. The pump manufacturer shall have, within a 150-mile radius of the jobsite, an authorized warranty center, fully staffed with factory trained mechanics, and equipped with a stock of all necessary spare parts for each model of pump furnished in this contract. Pump manufacturer shall have parts or unit distribution located in the United States.

D. All equipment furnished under this Specification shall be new and unused, shall be the standard product of manufacturers having a successful record of manufacturing and servicing the equipment and systems specified herein for a minimum of five (5) years.

1.03 SUBMITTALS

A. Copies of all materials required to establish compliance with the Specifications shall be submitted in accordance with the provisions of the General Conditions. Submittals shall include at least the following:

1. Shop and erection drawings showing all important details of construction, dimensions and anchor bolt locations. Shop drawings shall indicate that pumps can

be constructed in wet well provided.

2. Descriptive literature, bulletins, and/or catalogs of the equipment.

3. Data on the characteristics and performance of each pump. Data shall include guaranteed performance curves, based on actual shop test of similar units, which show that they meet the specified requirements for head, capacity, efficiency, NPSHR, submergence and horsepower. Curves shall be plotted from zero flow at Shut Off Head to Pump Capacity at minimum specified TDH. Catalog sheets showing a family of curves will not be acceptable.

4. The total weight of the equipment including the weight of the single largest item.

5. A complete total bill of materials of all equipment.

6. All submittal data required by the General Conditions.

7. Complete motor data.

8. Certified agreement to the conditions of the warranty.

1.04 OPERATING INSTRUCTIONS

A. Operating and Maintenance Manuals shall be furnished. The manuals shall be prepared specifically for equipment furnished and installed on this contract and shall include all required cuts, drawings, equipment lists, descriptions, etc., that are required to instruct operating and maintenance personnel unfamiliar with such equipment.

B. A factory representative of all major component manufacturers, who has complete knowledge of proper operation and maintenance, shall be provided for one(1) day to instruct representatives of the Owner and the Engineer on proper operation and maintenance.

1.05 TOOLS AND SPARE PARTS

A. The manufacturer shall furnish a complete set of recommended spare parts necessary as follows:

1. One (1) set of O-rings and gaskets for each pump type supplied.

2. One (1) set of seals for each size required by the pumping equipment supplied.

B. Spare parts shall be properly bound and labeled for easy identification without opening the packaging and suitably protected for long term storage.

1.06 PRODUCT HANDLING

A. All equipment and parts shall be properly protected so that no damage or deterioration will occur during a prolonged delay from the time of shipment until installations completed and

the units and equipment are ready for operation.

B. Factory assembled parts and components shall not be dismantled for shipment unless permission is received in writing from the Engineer.

C. Finished surfaces of all exposed pump openings shall be protected by wooden blanks, strongly built and securely bolted thereto.

PART 2 - PRODUCTS

2.01 OPERATING CONDITIONS

A. Each pump shall be rated at the horsepower, speed, flow, TDH, efficiency and speed as described in the Table 11312-01. The pumps shall be non-overloading throughout the entire range of operation without employing a service factor. The pump shall reserve a minimum service factory of 1.15. The performance curve submitted for approval shall state in addition to head and capacity performance, the pump efficiency, solids handling capability, and reflect motor service factor. Units shall be capable of a minimum of 30 motor starts per hour.

2.02 CONSTRUCTION

A. The pump shall be a centrifugal, non-clog, solids handling, submersible, wastewater type model NP3301HT3 as manufactured by ITT/Flygt or pre-approved equal. The pump volute, motor and seal housing shall be high quality gray cast iron, ASTM A-48, Class 30. The pump discharge shall be fitted with a standard ASA 125 lb. flange, faced and drilled. All external mating parts shall be machined and Buna N Rubber O-ring sealed on a beveled edge. All mating surfaces shall be flame proof joints with special labyrinth joint to prevent a flame or spark to travel to the media being pumped. Gaskets shall not be acceptable. All fasteners exposed to the pumped liquids shall be 300 series stainless steel.

2.03 ELECTRICAL POWER CORD

A. Electrical Power cord shall be STW-A, water resistant 600V, 60^0 C., UL and or CSA approved and applied dependent on amp draw for size. Cord length shall be as required to reach control panel but shall not be less than 25 feet.

B. The pump shall be triple protected with compression fitting and epoxy potted areas at the power cord entry to the pump. A separation between the junction box area of the pump and the motor by a stator lead sealing gland or terminal board shall be provided for air filled motors.

C. The power cable entry into the cord cap assembly shall be field serviceable and shall consist of grommets and washers which provide both a seal and strain relief. Each individual lead shall be stripped down to bare wire, at staggered intervals, and each strand shall be individually separated.

D. The power cord leads shall then be connected to the motor leads with extra heavy connectors

having brass inserts with a screwed wire to wire connection.

E. The connection box for epoxy potted units wiring shall be separated from the motor housing wiring by stripping each lead down to bare wire, at staggered intervals, and separating each strand. This area shall be filled with an epoxy compound potting.

F. The cord cap assembly where bolted to the connection box assembly and the connection box assembly where bolted to the motor housing shall be sealed with a Buna N Rubber O-ring on a beveled edge to assure proper sealing.

G. The pump controller shall be capable of reverse rotation with high torque to allow for cleaning. The controller manufacturer shall provide a 2 (two) year non-clog guarantee with normally expected sewer (grease, rags, etc.).

2.04 MOTOR

A. The stator, rotor and bearings shall be mounted in a sealed submersible type housing. The stator windings shall have Class F insulation, (155° C. or 311° F). NEMA B design. Further protection shall be provided by winding thermal sensors in each winding.

B. The pump and motor shall be specifically designed so that they may be operated partially or completely submerged in the liquid being pumped.

C. Stators must be capable of being repaired or rewound by a local motor service station. Units which require service only by the factory shall not be acceptable. No special tools shall be required for pump and motor disassembly.

D. Oil filled or air filled pumps shall be equipped with heat sensors. The heat sensor shall be a low resistance, bi-metal disc that is temperature sensitive. It shall be mounted directly on the stator and sized to open at 120°C or 130°C and automatically reset at 30 - 35°C differential. The sensor shall be connected in series with the motor starter coil so that the starter is tripped if a heat sensor opens.

2.05 BEARINGS AND SHAFT

A. An upper radial bearing and a lower thrust bearing shall be required. These shall be heavy-duty bearings which are permanently lubricated. Bearings which require lubrication according to a prescribed schedule shall not be acceptable.

B. The shaft shall be machined from stainless steel and be a design which is of large diameter with minimum overhang to reduce shaft deflection and prolong bearing life. The shaft may be constructed of C 1035 carbon steel if the shaft is isolated from the pumped liquid.

2.06 SEALS

A. The pump shall have two mechanical corrosion resistant tungsten carbide seals, mounted in tandem, with an oil chamber between the seals. The upper seal shall be used with the rotating seal faces being carbon and the stationary seal faces to be ceramic. The lower seal shall have tungsten carbide faces and shall be replaceable without disassembly of the seal

chamber and without the use of special tools. Pump-out vanes shall be present on the backside of the impeller to keep contaminates out of the seal area. Seals shall be locally available.

B. The pump shall be equipped with a seal leak detection probe and warning system. This shall be designed to alert maintenance personnel of lower seal failure without having to take the unit out of service for inspection or requiring access for checking seal chamber oil level and consistency.

C. There shall be one or two electric probe or seal failure sensors to detect a leak in the upper or lower seal. If the seal fails, contaminants which enter the seal chamber shall be detected by the sensor and send a signal to operate the specified warning device.

D. Units equipped with opposed mechanical seals shall not be acceptable.

2.07 IMPELLER

A. Impeller shall be of the enclosed non-clogging design and have pump-out vanes on the front and backside of the impeller to prevent grit and other materials from collecting in the seal area. Impeller shall not require coating and comprised of 25% high chrome metallurgy.

B. Impellers shall be dynamically balanced. The tolerance values shall be as listed below according to the International Standard Organization grade 6.3 for rotors in rigid frames. The tolerance is to be split equally between the two balance planes which are the two impeller shrouds.

C. The impeller shall be slip fit to a shaft and key driven. A300 series stainless steel washer and impeller bolt shall be used to fasten the impeller to the shaft. Impeller shall be field adjusted internally using the one (1) impeller bolt assembly.

2.08 CASING

A. The casing shall be of the end suction volute type having sufficient strength and thickness to withstand all stress and strain from service at full operating pressure and load. The casing shall be of the centerline discharge type equipped with an automatic pipe coupling arrangement for ease of installation and piping alignment. The design shall be such that the pumps will be automatically connected to the discharge piping when lowered into position with the guide rails. The casing shall be accurately machined and bored for register fits with the suction and casing covers.

B. A volute case wearing ring shall be provided to minimize impeller wear. The wear ring shall be alloy 230 brass, ASTMB-43 and held by 300 series stainless steel fasteners. The wear ring shall be easily replaceable in the field.

2.09 ACCESS FRAMES, GUIDE RAILS, AND ANCHOR BOLTS

A. The manufacturer shall be furnished with the necessary aluminum access frames, complete with hinged and hasp-equipped covers, stainless steel upper guide holder and cable holder. The frames shall be securely mounted above the pumps.

B. Lower guide holders shall be integral with the discharge connection as required. Guide bars shall be of 304 stainless steel size and length as required by the pump manufacturer.

C. Intermediate guide brackets shall be furnished and installed so that the maximum length of unsupported guide bars will be no longer than 6 feet, and shall be fabricated of 316 stainless steel.

D. Stainless steel cable holders including the cable hooks shall be fabricated from type 304 stainless steel plate. Sharp corners and edges shall be ground smooth to prevent abrasion and cutting of electrical cable insulation. The cable holder shall be of sufficient length and strength to provide support for each separate cable, except that the pump power and lift cables may use the same hook position, provided the cables do not foul one another and the lift cable is easily accessed from the hatch opening.

E. Manufacturer shall furnish 304 anchor bolts as required.

2.10 PAINTING

A. The pump shall be painted after assembly, but before testing with an alkyd air dried enamel. The paint shall be applied in one coat with a minimum thickness of 3 to 4 mils.

2.11 SERVICEABILITY

A. The pumps shall be capable of being removed from the wet well without disturbing the stationary part of the discharge piping.

PART 3 - EXECUTION

3.01 TESTING

A. Testing shall be required and include the following:

1. Furnish the services of a qualified manufacturer's representative for two separate trips one to inspect installation and startup and one to train operators on maintenance.

2. The pump shall be visually inspected to confirm that it is built in accordance with the specification as to HP, voltage, phase and hertz.

3. The motor and seal housing chambers shall be hi-potted to test for moisture content and/or insulation defects.

4. Pump shall be allowed to run dry to check for proper rotation.

5. Discharge piping shall be attached, the pump submerged in water and amp readings shall be taken in each leg to check for an imbalanced stator winding. If there is a significant difference in readings, the stator windings shall be checked with a bridge to determine if an unbalanced resistance exists. If so, the stator will be replaced.

B. Certified performance curves shall be provided in the operation and maintenance manuals for each pump of the same size. Cost for these tests shall be included in the bid price.

3.02 WARRANTY

A. The pump unit or any part thereof shall be warranted against defects in material or workmanship within one (1) year from date of final acceptance by the Owner and shall be replaced at no charge with a new part, F.O.B. factory or authorized warranty service station. In addition, pumps shall be provided with a one (1) year no-clog guarantee under normally expected sewer conditions (rags, grease, etc.).

3.03 OPERATING AND MAINTENANCE INSTRUCTION

A. Complete operating and maintenance instructions for the pump shall be furnished to the Owner, the instructions shall be prepared specifically for this installation and shall include cuts, drawings, equipment, lists, spare parts, descriptions, etc., that are required to instruct operating and maintenance of such equipment.

3.04 COORDINATION WITH ELECTRICAL REQUIREMENTS

A. Unless otherwise specified, the Contractor shall be responsible for furnishing all controls including magnetic starters with overload and under voltage protection, pushbutton stations, timers, limit switches, H-O-A switches, enclosures and other items as required by particular equipment in accordance with the manufacturer's recommendations and as shown on the Drawings.

B. The vendors of the various pieces of equipment shall refer to the electrical specifications and the electrical drawings to supplement this section of the Specifications. Any additional equipment shown on the electrical plans or called for in the electrical specifications and not specifically specified in this section shall be furnished by the vendor. The plant electrical system is designed to the specific requirements of the Owner using a control system. The vendors shall design their electrical equipment and panels to match these electrical requirements. Shop drawings shall be submitted showing external wiring terminals and properly identifying the devices they are to be inter-connected with. Any drawings submitted where it is obvious that no effort was made to properly prepare them for checking by the Engineer will be rejected.

C. The electrical contractor shall coordinate with the mechanical contractor and carefully review the mechanical packages proposed to be supplied. It shall be the electrical contractor's responsibility to insure that all wire and conduit needed for electrical appurtenances, associated with mechanical packages, are provided even if not specifically called for in the plans and specifications.

TABLE 11312-01

SUBMERSIBLE NON-CLOG WASTEWATER PUMPS

TAG NO.	LOCATION	CONTENTS HANDLED	DESIGN FLOW	DESIGN HEAD	HORSEPOWER	MAX. RPM	MIN. PUMP EFFICIENCY	REMARKS :
FB-01	Faubourg Pump Station	Wastewater	1,100 GPM	136.5 FT.	85 HP	1775	66%	VFD
FB-02	Faubourg Pump Station	Wastewater	1,100 GPM	136.5 FT.	85 HP	1775	66%	VFD
FB-03	Faubourg Pump Station	Wastewater	1,100 GPM	136.5 FT.	85 HP	1775	66%	VFD

D. Controls configuration shall be adjustable and shall be able to be adjusted such that two (2) pumps do not run simultaneously.

END OF SECTION

SECTION 15000
GENERAL MECHANICAL

PART 1 - GENERAL CONDITIONS

1.01 WORK INCLUDED

A. The general conditions of the general specifications are made as part of these specifications and apply the same as if attached hereto. The mechanical subcontractors should, before bidding, read and thoroughly understand all general conditions, priority and scheduling.

1.02 SCOPE OF WORK

A. This section calls for the furnishing of labor, materials, equipment, and all the services, and of performing all operations required for the complete mechanical systems as hereinafter specified and/or shown on the accompanying drawings.

1.03 GENERAL REQUIREMENTS

A. The mechanical subcontractor shall install his work to meet the existing conditions as found, and to accommodate work of other trades. This contractor shall be responsible for timely placing of sleeves in forms before concrete is poured. Cooperate with the general contractor and place pipes and ducts in floors, walls, furred spaces, etc., so there will be no delay. Sheet metal or iron pipe sleeves shall be provided for pipes passing through floors, wall or partitions.

B. Contractor shall furnish and properly install materials, devices, equipment, insulation, controls, appurtenances, etc., mentioned in these specifications and/or shown on plans or required to make a complete and satisfactory installation in working order whether fully shown or not.

C. Contractor should visit the site and acquaint himself thoroughly with conditions governing installation of his work.

D. All other plans shall be checked in relation to these plans so that all conditions will be furnished and installed in this contract to provide complete and satisfactory systems.

1.04 LAWS, RULES, REGULATIONS, FEES, ETC.

A. The entire mechanical work shall comply with rules and regulations of the local and state authorities having jurisdiction including the State Fire Marshal and the State Board of Health. All modifications required by the said authorities at any time shall be made by the mechanical contractor without additional charge. In cases where alterations to or deviations from this specification and accompanying plans are required by the authorities, contractor shall report same to the Engineer and obtain his approval before work is started. Contractor shall obtain all necessary fees and permits, the cost of same to be included in the Contract.

1.05 DRAWINGS

A. Plans and detail sketches are submitted to limit, explain, and define structural conditions, specified requirements, pipe sizes, and manner of erecting work. Structural or other conditions may require certain deviations from manner of installation shown, and such deviations shall be made as required, but specified sizes and requirements necessary for satisfactory operation shall remain unchanged.

B. It may be necessary to shift or to change routing of ducts and or piping and this shall be done, but such changes must be referred to Engineer for approval before proceeding. Extra charges will not be allowed for these changes.

C. Typical details are shown on plans, and in any cases where Contractor is not certain about the method of installation of his work, he shall ask for details, lack of details will not be an excuse for improper installation.

D. Contractor bidding on this portion of the work must be fully experienced in installations of equal size, complexity and quality. In bidding, he acknowledges that he fully understands the scope of the work and design and has the ability, for the contract price to assemble and install the equipment, piping, and ductwork shown or specified, so as to mold same into a satisfactory workable system and arrangement, without responsibility for capacities and sizes set by these documents.

E. Contractor shall recognize that the amount of information and detail that could be provided in Contract Documents is limitless and could extend into every minute detail, step, sequence, and operation to a point where only workmen would be required, without drawing on ability experience, and ingenuity of the Contractor.

1.06 MATERIALS

A. All materials must be new and of the best quality. All materials and apparatus must be of the best grade and of standard manufacture and first-class in every respect. Where directed by the Engineer, Contractor shall submit a sample for approval before proceeding.

1.07 STANDARDS

A. In general, standards for products and workmanship shall be as described in each individual section.

B. The standards referred to, except as modified in these specifications shall have full force and effect as though printed in these specifications. These standards are not furnished to bidders for the reason that the manufacturers and trades involved are assumed to be familiar with their requirements. The Engineer will furnish, upon request, information as to how copies of the standards referred to may be obtained.

C. Notwithstanding any reference in this section of the specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalogue number, such references shall be interpreted as establishing a standard of quality and shall not be construed limiting competition and the Contractor in such cases, may at his option, use any

article, device, product, material, fixture, form or type of construction which in the judgement of the Engineer, expressed in writing, is equal to that specified.

1.08 MATERIALS SPECIFIED OR SUBSTITUTED (PRIOR APPROVALS)

A. Refer to Instructions to Bidders.

1.09 SHOP DRAWINGS

A. Before proceeding with the work, contractor shall make complete shop and working drawings of such apparatus or connections as directed by the Engineer and/or hereinafter specified. These drawings shall show construction details and dimensions of each piece of equipment so drawn.

B. Engineer's approval of shop drawings shall not relieve the Contractor from responsibility of incorrectly figured dimensions or any other errors in these drawings or specified even though approved by the Engineer, shall not relieve this Contractor from furnishing and erecting same.

C. Ten (10) sets of prints of shop drawings shall be submitted to Engineer for approval. These prints shall be supplied as part of this contract. Submit all shop drawings at the same time or as soon as practical after award of the contract. No separate items will be accepted.

D. Where laws or local regulations provide that certain accessories such as gauges, thermometers, relief valves and parts be installed on equipment, it shall be understood that such accessories shall be furnished if no specific reference to them is made in the specifications.

1.10 CUTTING AND PATCHING

A. All cutting necessary for this work will be done by this Contractor at his own expense, but all patching shall be done by the General Contractor. No beams or joists shall be cut without prior approval of Engineer. After initial resurfacing has been done any further cutting, patching or painting shall be done at the expense of this Contractor.

1.11 INTERFERENCES

A. The drawings are generally diagrammatic and this Contractor shall harmonize his work with that of the different equipment, piping, etc., shall be installed so as to function properly. In the case where an interference develops, the Architect is to state which equipment, piping, etc., is to be relocated regardless of which item was first installed.

1.12 EXCAVATION AND BACKFILL

A. This Contractor shall do all excavating required to lay the specified services and after same have been laid, he shall do all backfilling to the satisfaction of all parties concerned and shall cart away from the premises all unnecessary dirt, rubbish, etc., as directed. Backfill shall be well tamped.

1.13 SPACE REQUIREMENTS

A. Contractor shall check all plans pertaining to this job so as to be fully aware of the space limitations for all various items of equipment. Equipment is not to be bid on, submitted for preliminary approval nor placed on the job if it is so bulky and large that adequate access for proper maintenance and servicing cannot be achieved in the space provided.

1.14 FOUNDATIONS AND SUPPORTS

A. This contractor shall furnish and install foundations and supports of concrete or steel shapes for equipment requiring same, unless specifically indicated otherwise or specified.

B. All floor mounted mechanical equipment shall be mounted on 4" high concrete housekeeping pad unless specifically shown otherwise on plans. Refer to plans for special requirements for foundations and supports.

1.15 HANGERS, ESCUTCHEONS, ETC.

A. Mechanical Contractor shall furnish and install all thimbles, inserts and other requirements necessary for the support of his equipment and piping. Assist and cooperate with other trades in locating and placing these items.

1.16 PROTECTION OF EQUIPMENT

A. See individual sections for protection of equipment.

B. This Contractor shall at all times take such precautions as may be necessary to properly protect his equipment from damage. Failure on the part of the Contractor to comply with the above to the entire satisfaction of the Engineer will be sufficient cause for the rejection of the particular piece of equipment in question.

1.17 TESTING

A. All pressure lines, unless elsewhere specified, shall be tested under 150" hydrostatic pressure for a minimum of 5 hours. Contractor shall provide valve at farthest point in line to bleed off air and for inspection.

B. Notice shall be given the Engineer and building inspector before tests are made, the test is not to be drawn off pipes and pipes are not to be covered or insulated until filled pipes have been examined and testing approved by the Engineer and inspectors.

C. In case of defects, they shall be made good to the satisfaction of the Engineer and work retested. All such work shall be done by the Contractor with no additional expense to the Owner.

D. Gas piping shall be tested at 10 psi air pressure for a minimum of one (1) hour period without appreciable drop. Text pipe with soap suds for leaks prior to final connections.

E. Contractor shall make any other tests as may be called for by the Engineer, and all other tests so called for elsewhere in these specifications.

F. All sanitary sewer piping shall be hydrostatic pressure tested with a 10'-0" high test tee for a minimum of one (1) hour in its entirety or in sections. If applied to the entire system, all openings in the piping shall be tightly sealed, except the highest opening and the system shall be filled to the point of overflow. Any leaks detected shall be corrected and the test reapplied. If the system is tested in sections, each opening shall be tightly sealed except the highest opening of the section under test, and each section shall be filled with water, but no section will be tested with less than 10'-0" head of water. In testing successive sections at least 10'-0" of the next section shall be tested, so that no joint of pipe in the building shall have been submitted to a test of less than a 10' -0" head of water. The water shall be kept in the system, or in a portion under test, for a minimum of one (1) hour before the inspection starts.

A final test of the completed sanitary drainage system, including vents, shall be made using the peppermint or smoke test as instructed by the Engineer. The smoke test will be made by filling all traps with water and then introducing into the system a pungent thick smoke produced by one or more smoke machines. When smoke appears at a vent opening on the roof, they shall close and a pressure equivalent to a 1" water column shall be built and maintained for fifteen minutes before the inspection starts. When peppermint test is used, 2 oz. of oil of peppermint shall be introduced for each line or vent.

1.18 CLEANING AND ADJUSTING

A. Before receiving final approval from the Engineer, the Contractor shall clean out all lines, adjust all valves, control equipment and other equipment. Clean all pipe and equipment and leave the entire installation in good working order. All heaters, fans, grilles, controls, etc., shall be adjusted to perform in correct and satisfactory manner, with sequences, etc., as called for in the specifications hereinafter specified and on plans.

1.19 PAINTING

A. Refer to Section 09900 for painting requirements.

1.20 PARTS LIST AND INSTRUCTION MANUAL

A. See individual sections for specific instructions.

B. This Contractor shall deliver to the Engineer three (3) copies of printed instructions relating to operating, proper maintenance and repair parts list indicating the various parts by name, number and diagram for each piece of equipment installed. An independent test and balance report shall also be included in parts lists and instruction manual.

C. The shop drawings, parts list, and maintenance and repair instructions shall be neatly bound in a canvas-covered notebook and turned over to the Engineer before acceptance of the work.

1.21 GUARANTEE

A. Contractor shall guarantee materials, equipment and workmanship installed and performed under this contract for a period of one (1) year from date of the final completion and official acceptance of the contract.

He shall furnish free of charge to the Owner all materials and labor necessary to comply with the above guarantee, which shall be based on defective materials and/or workmanship, and on such basis shall be responsible if a deficiency if found, for any adjustment, replacement, or correction which may be necessary to replace the project to first class condition. This guarantee shall include refrigerant charges, but shall not include the changing of filters.

END OF SECTION

SECTION 15100

VALVES AND APPURTENANCES

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required to install and make ready for operation all valves and appurtenances as shown on the drawings and as specified herein.

B. The equipment shall include, but not be limited to, the following:

1. Pressure Gauges
2. Quick Connect Couplings
3. Air Release Valves
4. Plug Valves
5. Gate Valves
6. Check Valves

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02221: Excavation and Backfill of Trenched.

B. Section 02515: HDPE Pipe

C. Section 02622: PVC Pipe.

D. Section 02701: Water Mains.

1.03 DESCRIPTION OF SYSTEMS

All of the equipment and materials specified herein are intended to be standard for use in controlling the flow of wastewater.

1.04 QUALIFICATIONS

All of the types of valves and appurtenances shall be products of well established reputable firms who are fully experienced, reputable and qualified in the manufacture of the particular equipment to be furnished. The equipment shall be designed, constructed and installed in accordance with standard practices and methods and shall comply with these specifications as applicable.

1.05 SUBMITTALS

A. Submit to the Engineer, within 30 days after execution of the contract, a list of materials to be furnished, the names of the suppliers and the date of delivery of materials to the site.

B. Complete shop drawings of all valves and appurtenances shall be submitted to the Engineer for approval in accordance with the requirements of Section 01340 and the General Conditions.

1.06 TOOLS

Special tools, if required for normal operation and maintenance, shall be supplied with the equipment.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Valves:

1. Gate Valves

a. Gate valves shall be double disc parallel seat, iron body, bronze mounted, side wedge type and open counterclockwise. They shall comply with AWWA C500 as latest revised.
b. Gate valves shall be rated at 200 psi water working pressure with 400 psi hydrostatic test for structural soundness for 2" through 12" and 150 psi water working pressure with 300 psi hydrostatic test for structural soundness in 20" size. Testing shall be conducted in accordance with AWWA C500.
c. End connections shall be in accordance with ANSI B 16.1 125# flange drilling and mechanical joints per AWWA C111 without accessories.
d. All ductile iron shall comply with ASTM A536 Gr. 65-45-12. Castings shall be clean and sound without defects. No plugging or welding of defects will be allowed.
e. Stems shall be manganese bronze having a minimum tensile strength of 60,000 psi and a minimum yield of 20,000 psi for 20" valve.
f. Bolts shall be electro-zinc plated steel with hex heads and hex nuts in accordance with ASTM A307 and ASTM A563 respectively.
g. Gate valves shall be non-rising stem (NRS) meeting requirements of AWWA C500. Valves shall be furnished o-ring stem seals using 2 o-rings set in the seal plate.
h. Discs for valve sizes 2" through 4" shall be bronze; for sizes 6" and larger, they shall be cast iron bronze faced. Bronze facing shall be machine after insertion into disc face. Disc spreaders for valves 2" through 8" shall be

bronze. Disc spreaders for valves 10" through 20" shall be cast iron with bronze faced. Spreaders shall actuate from stem nut independent from valve body.

i. Direction to open shall be counter-clockwise unless otherwise specified.
j. The inside and outside of all valves, together with all working parts ecept bronze and machined faces, shall be coated in accordance with AWWA standards.
k. Marking shall be in accordance with AWWA C500 standards, to include name of manufacturer, year of manufacture, maximum working pressure and size of valve.
l. Valves must be of domestic United States of America.
m. Valves shall be manufactured by Mueller Company, LLC. of Tennessee. Other manufacturers shall be submitted and approved by Tammany Utilities prior to use.

2. Eccentric Plug Valves

a. Plug valves shall be solid one piece, cast of ASTM A536 ductile iron. The plug shall have a cylindrical seating surface eccentrically offset from the center of the shaft. Plug shall not contact the seat prior to 90% closed. Plug facing shall be Chloroprene (CR), or other resilient facing suitable for the application.
b. Plugs shall be solid one piece, cast of ASTM A536 ductile iron. The plug shall have a cylindrical seating surface eccentrically offset from the center of the shaft. Plug shall not contact the seat prior to 90% closed. Plug facing shall be Chloroprene (CR), or other resilient facing suitable for the application.
c. Seats shall be 1/8" thick welded overlay of not less than 95% pure nickel. Seat shall be at least 1/2" wide and raised. The raised surface shall be completely covered with nickel to insure that the resilient plug face contacts only the nickel seat.
d. Adjustable Packing shall be of the multiple V-ring type, with a packing gland follower. Shaft seals shall permit inspection, adjustment or complete replacement of packing without disturbing any part of the valve or actuator assembly except the packing gland follower.
e. Eccentric plug valves shall be 100% ported.
f. Eccentric plug valves and actuators shall meet or exceed the latest revisions of AWWA C517 and other applicable standards. Flanged ends shall be per ANSI B16.1 and mechanical joint ends per AWWA C111.

3. Check Valves

a. General: Swing check valves for water, sewage, sludge, and general service shall be of the outside lever and spring or weight type, in accordance with AWWA C 508 - Swing-Check Valves for Waterworks Service, 2-in. through 24-in. NPS, unless otherwise indicated, with full-opening passages, designed

for a water-working pressure of 150 psi. They shall have a flanged cover piece to provide access to the disc.

b. Body: The valve body and cover shall be of cast iron conforming to ASTM A 126 - Gray Iron Castings for Valves, Flanges, and Pipe Fittings, with flanged ends conforming to ASME B 16.1 - Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800, or mechanical joint ends, as indicated.

c. Disc: The valve disc shall be of cast iron, ductile iron, or bronze conforming to ASTM B 584 - Copper Alloy Sand Castings for General Applications.

d. Seat and Rings: The valve seat and rings shall be of bronze conforming to ASTM B 584 or B 148 - Aluminum-Bronze Castings, or of Buna-N.

e. Hinge Pin: The hinge pin shall be of bronze or stainless steel.

f. Shop coat finish shall comply with Section 09900 of these specifications.

g. The valve shall be suitable for direct burial and shall have flanged or mechanical joint ends. Valves must be of domestic United States of America.

h. Valves shall be manufactured by Mueller Company, LLC. of Tennessee. Other manufacturers shall be submitted and approved by Tammany Utilities prior to use.

4. Actuators

a. Worm gear actuators shall be provided on all valves six inches and larger. Actuators shall be enclosed in a cast iron housing, with outboard seals to protect the bearings and other internal components. The actuator shaft and gear quadrant shall be supported on permanently lubricated bronze bearings.

b. Buried actuators shall be 90% grease filled. Input shaft and fasteners shall be stainless steel. Actuator mounting brackets shall be totally enclosed.

B. Pressure Gauges

Each pressure gauge shall be direct mounted, cast aluminum case, with a 4-1/2" diameter dial and furnished with a clear glass crystal window, 1/4" shut-off valve, and a bronze pressure snubber. Provide diaphragm seals between shut-off valve and pressure gauge on all lines. All gauges shall be weatherproofed. The face dial shall be white finished aluminum with jet black graduations and figures. The face dial shall indicate the units of pressure being measured (e.g., feet, inches, etc.) or be dual scale.

C. Quick Connect Couplings

Quick connect couplings shall consist of bronze female adapter with female threads complete with plug by same manufacturer. Coupling components shall be as manufactured by Ever-Tite Coupling Company, Inc., New York, New York, OPW Seal Fast Adapter as manufactured by OPW (Dover Corporation) or approved equal.

D. Air Release Valves

1. Sewage air and vacuum release valve to be a design with a conical shape body, and no contact between the fluid and sealing area. The valve body and spindle spring shall be a minimum 316 grade stainless steel, designed to facilitate disassembly for cleaning and maintenance. The float, valve seat and all working parts shall be of corrosion-resistant materials. Valves shall be equipped with the necessary attachments, including ball valve and cam-lock fitting to permit back flushing after installation without dismantling the valve.
2. The air release mechanism shall be a non-shock type by roll on seal that provides positive open and close operation with leak free sealing. The air and vacuum release valve working pressure range shall be 0 to 250 psi.
3. The air release shall be the following H- Tec or A.R.I. models or approved equal with size to be recommended by the manufacturer.

PART 3 - EXECUTION

3.01 INSTALLATION

A. All valves and appurtenances shall be installed in the locations shown, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the Engineer before they are installed.

B. After installation, all valves and appurtenances shall be tested at least one (1) hour at the working pressure corresponding to the class of pipe, unless a different test pressure is specified. If any joint proves to be defective, it shall be repaired to the satisfaction of the Engineer.

3.02 SHOP PAINTING

Ferrous surfaces of valves and appurtenances shall be painted in accordance with Section 09900 unless specified elsewhere. All pipe connection openings shall be capped to prevent the entry of foreign matter prior to installation.

3.03 INSPECTION AND TESTING

Completed pipe shall be subjected to hydrostatic pressure test for four (4) hours at full working pressure. All leaks shall be repaired and lines retested as approved by the Engineer.

END OF SECTION

THIS PAGE IS INTENTIONALLY BLANK

DIVISION 16 - ELECTRICAL
SECTION 16010 - BASIC ELECTRICAL REQUIREMENTS

PART 1.00 GENERAL

1.01 SCOPE

A. The work to be performed under these specifications shall include the furnishing of all labor, materials, equipment and services required for a complete electrical system as specified herein and as shown by the Drawings. A state of Louisiana licensed Electrical Contractor shall perform the work specified herein. The work includes but is not limited to:

1. Demolishing the existing electrical service as shown on the Drawings and providing a new 120/240 Volt, 3-Phase, 4-wire service, including coordinating with the local utility company. Include all associated costs in bid.

2. Demolishing the existing electrical equipment as shown on the Drawings.

3. Furnishing and installing new lighting and controls.

4. Furnishing and installing new disconnect switches, panels, variable frequency drives, and transformers as shown on the Drawings.

5. Furnishing and installing new breakers, conduits, and conductors to feed existing pumps.

6. Furnishing and installing new pump control panel with breakers, meter and main disconnect, pump controls, status indication lamps, and low voltage breakers as directed by the Owner's selected control panel manufacturer.

7. Installing and connecting pump power and control cables furnished with the pump control panel, including motor power and control cables, and level controls.

8. Furnishing and installing grounding as required for each site as shown on the drawings.

9. Furnishing and installing a new natural gas generator and automatic transfer switch at each site as shown on the Drawings.

10. Installation of temporary construction power required by the General Contractor and Sub-Contractors during the construction period.

1.02 GENERAL CONDITIONS

A. The General Conditions and Supplementary General Conditions are a part of this section of these Specifications. The Contractor is cautioned to read and be thoroughly familiar with all provisions of the General Conditions. These conditions shall be complied with in every aspect. The word "shall" where used, is to be understood, as mandatory and the word "should" as advisory. "May" is used in the permissive sense.

1.03 GENERAL REQUIREMENTS

A. The Contractor is referred to all of the Drawings for building construction as well as the electrical Drawings.

B. The Contractor shall examine the site and shall verify to his own satisfaction the location of all utilities, and shall adequately inform himself as to their relation to his work before entering into a Contract and he shall base his bid on any conditions, which may be encountered during the progress of the work. Contractor is responsible for all utility cost required to bring the new service to the new elevated platforms.

C. The Contractor shall furnish and install properly all materials, devices, equipment, supports, controls, appurtenances, etc., mentioned or required to make complete or satisfactory installations in working order whether shown or not. All electrical equipment shall be connected in accordance with manufacturer's instructions. All work shall be executed in a workmanlike manner and shall present a neat and mechanical appearance when completed.

D. Electrical service required for all equipment furnished under this general contract shall be roughed-in and connected by the Contractor. It is the responsibility of the Contractor to obtain correct roughing-in dimensions and requirements for this equipment. Refer to the Mechanical and Architectural Sections for these Specifications.

1.04 MINIMUM STANDARDS

A. Applicable rules of the National Electrical Code apply as a minimum standard for this contract, but do not replace or reduce any specific requirement herein.

1.05 DRAWINGS

A. Plans and detail sketches are submitted to limit, explain, and define structural conditions, specified requirements, conduit sizes, and manner of erecting work. The Contractor is cautioned to field check and verify all existing conditions before bidding, as no extra compensation will be allowed for conditions found different than represented in the construction drawings and/or specifications. Written approval of the Engineer shall be obtained prior to any alterations or additions to specified work.

B. Structural or other conditions may require certain modifications from the manner of installation shown, and such deviations are permissible and shall be made as required, but specified sizes and requirements necessary for satisfactory operations shall remain unchanged. Shifting of conduits or equipment shall be referred to the Engineer for approval. Extra charges will not be allowed for these changes without the written approval of Engineer.

C. The drawings and these specifications are complementary to each other and what is called for by one shall be binding as if called for by both.

D. General arrangement of work is indicated on plans. Due to the small scale of the drawings, offsets, fittings, and boxes required are not all indicated; provide fittings, boxes, etc., as needed in accordance with codes and accepted practices.

1.06 SUPERVISION

A. The Contractor shall personally or through an authorized and competent representative, constantly supervise the work from beginning to completion and final acceptance. So far as possible, he shall keep the same foreman and workmen throughout the project duration.

B. During its progress, the work shall be subject to inspection by representatives of the Engineer, at which times the Contractor shall furnish required information.

C. It is not the Engineer's duty to direct or guarantee the work of the Contractor, but to assist the Owner in obtaining a complete building in accordance with plans, specifications and addenda and to furnish engineering services in accordance with recognized practices.

1.07 PRIOR APPROVALS

A. The Contractor shall base his proposal on materials as specified herein. Any references to a specific manufacturer or trade name is made to establish a standard of quality and to define a type of product and in no way is intended to indicate a preference for a particular manufacturer. It is the intent of these specifications to allow all manufacturers of equipment, products, etc., judged equal to the specified product to bid on a competitive basis.

B. Requests for substitutions or prior approvals shall be made as indicated in the Instructions to Bidders, General Conditions of the Contract for Construction, Supplementary General Conditions, Special Conditions and/or general requirements.

1.08 MEASUREMENTS

A. The Contractor shall verify all measurements and shall be responsible for the correctness of same, before ordering any materials or doing any work. No extra charge or compensation will be allowed for any differences between the actual measurements and those indicated on the drawings.

1.09 LAWS, PERMITS AND FEES

A. The entire electrical work shall comply with the rules and regulations of the City, Parish, and State, including the State Fire Marshal and State Board of Health, whether so shown on plans or not. The Contractor shall pay fees for permits, inspections, etc., and shall arrange with the inspecting authorities all required inspections. The Contractor shall contact utility companies and make arrangements for all service connections, verifying locations with the utility and paying all charges pertaining thereto.

B. The Contractor shall contact the local utility company regarding connection of permanent service and include in his bid any fees, construction charges or other charges associated

with obtaining electrical service to the facility.

1.10 SITE INSPECTION

A. The Contractor shall visit the site and familiarize himself with difficulties attendant to the successful execution of the work before bidding. Failure to visit the site shall not relieve the Contractor of the extent or conditions of the work required of him.

PART 2.00 PRODUCTS

2.01 MATERIAL AND EQUIPMENT

A. All materials, equipment, and accessories installed under this Contract, whether approved or not, shall be new and shall conform to all rules, codes, etc., as recommended or adopted by the National Association(s) governing the manufacture, rating and testing of such materials, equipment, and accessories.

2.02 SHOP DRAWINGS

A. The Contractor shall submit to the Architect complete descriptive and dimensional data on the following items for review and approval:
1. Pump Control Panels
2. Disconnect Switches
3. Light Fixtures and Controls
4. Panelboards
5. Surge Protective Device
6. Motor Electrical Data
7. Conduits, Fittings, and Bushings
8. Conductors
9. Variable Frequency Drives
10. Natural Gas Generator
11. Automatic Transfer Switch

PART 3.00 METHODS OF INSTALLATIONS

3.01 CONTRACTOR COORDINATION

A. The Drawings are diagrammatic in nature. Cooperate with other trades so the interferences of facilities and equipment will be avoided.

3.02 PAINTING

A. Painting shall be performed as described in the painting specifications. No painting will be required by the Contractor except for touch-up of factory finishes on equipment furnished under this contract.

3.03 APPLICABLE GENERAL CODES AND REGULATIONS

A. All electrical work and equipment, in whole or in part, shall conform to the applicable portions of the following specifications, codes and regulations in effect on that date of invitation for bids, and shall form a part of this specification.
   1. National Electrical Code, Latest Edition as accepted by the State Fire Marshal
   2. National Electrical Manufacturers Association Standards
   3. National Fire Protection Association Recommended Practices
   4. Local, City and State Codes and Ordinances
   5. National Board of Fire Underwriter's Recommended Practices
   6. Life Safety Code, Latest Edition as accepted by the State Fire Marshal
   7. International Building Code

B. Equipment that has been inspected and approved by the Underwriter's Laboratory shall bear its label or appear on its list of approved apparatus.

3.04 TESTS AND INSPECTIONS

A. The Contractor shall assist in making periodic inspections or tests required by the Architect or Engineer. When requested, the Contractor shall provide the assistance of foremen and qualified craftsmen for reasonable duration of each test, etc.

3.05 SAFETY PRECAUTIONS DURING CONSTRUCTION

A. It shall be the Contractor's responsibility to furnish and install proper guards and instruction signs for prevention of accidents and to provide and maintain for the duration of construction any installations needed for safety of life and property.

3.06 SLEEVES, INSERTS AND OPENINGS

A. This Contractor shall plan work in advance of pouring concrete floors or walls. He shall furnish and install all sleeves or openings through floors or walls required for passage of conduits, pipes, or ducts installed by him. This Contractor shall furnish and install inserts and hangers required to support bus bars, bus ducts, conduit, cables, pull boxes, etc.

B. Sleeves shall be of 16-gauge galvanized sheet steel, rigidly supported and suitably packed to prevent ingress of wet concrete. If the sleeves, hangers, inserts, etc., are improperly installed, this Contractor shall, at his own expense, do all necessary cutting and patching to rectify the errors.

3.07 MOTOR AND CONTROL WIRING

A. Other Contractors will furnish and install motors and will furnish motor starters and control panels except where noted otherwise. The Contractor shall connect motors and shall install and connect starters where called for.

3.08 EQUIPMENT NAMEPLATE

A. Each item of electrical equipment installed by the Contractor shall be provided with an engraved nameplate noting the equipment's function or designation. Nameplates shall be engraved laminated plastic with black letters on a white background. Letters shall be 1/4"

high, all caps.

3.09 PANELBOARD SCHEDULES

A. The Contractor shall provide, and affix typed panelboard schedules for each panelboard (if required). Schedule will accurately list equipment served by each branch circuit.

3.10 COMPLETION

A. The Contractor shall leave all electrical equipment with proper connections, and in proper working order. He shall test the entire electrical system in the presence of the Engineer or his representative to show that it is properly installed. Contractor shall leave all panels and switches completely fused or complete with circuit breakers.

3.11 RECORD DRAWINGS

A. The Contractor shall furnish one (1) complete set of drawings on which any changes in the work shall be shown. These drawings must be turned over to the Architect prior to final acceptance of the work. In the event unforeseen obstructions occur in the work, the Contractor shall confer with the Engineer and obtain his written consent before undertaking any deviation from the governing plans.

3.12 GUARANTEE

A. The Contractor shall guarantee to keep the entire electrical system as installed by him or his subcontractors in repair and in perfect working order for one (1) year from the date of the final Certification of Final Acceptance, and shall furnish free of cost to the Owner, all material and labor necessary to comply with the above guarantee; said guarantee shall be based upon defective material and workmanship. In any case where equipment has a factory warranty exceeding this one-year limit, the full extent of the warranty shall apply.

3.13 CLEANING

A. When all work has been finally tested, the Contractor shall clean all fixtures, equipment, conduits, ducts, and all exposed work. All cover plates and other finished products shall be thoroughly cleaned.

3.14 INSTRUCTION MANUALS

A. The Contractor shall provide three (3) operating and maintenance instruction manuals on all systems and equipment installed in the electrical work.

3.15 CONTRACTOR SPECIAL NOTE

A. The Contractor is again cautioned to refer to all parts of these Specifications and all Drawings, not just electrical sections, and the individual cross references made to other standard specifications or details describing any electrical work, which may be required under these other sections. The Contractor is cautioned to note carefully any other

sections which may reference electrical work in order for this Contractor to fully understand the wiring requirements and electrical work that is required. Any conflicts found between the electrical sections of these Specifications or Drawings shall be immediately directed to the General Contractor for clarification.

B. These Specifications and the electrical Drawings size equipment, wire, conduit, etc. based on the horsepower of motors and/or wattages of equipment as shown on the plans or specified herein. The Contractor shall install electrical raceways, conductors, fuses, safety switches, breakers, contactors, starters or any other electrical equipment with the capacities to suit the horsepower and/or wattages of the equipment actually furnished and installed. The Contractor shall not furnish or install any electrical raceways, conductors, safety switches, contactors or motor starters of sizes smaller than those shown on the Drawings or specified herein. The Contractor shall coordinate with the various sections of the Specifications and/or Drawings and with the various Sub-Contractors to provide the properly sized equipment without additional cost to the Owner.

C. The Contractor shall be required to install electrical conduit and wire underground in some areas. Contractor is cautioned to exercise extreme care when digging to not damage any existing utilities or equipment. Contractor shall be required to repair any utilities or equipment he may damage during construction.

D. The Contractor will be required to modify existing electrical services and equipment. Contractor shall not disconnect service to any equipment or make any equipment modifications without coordinating all such work with the Owner prior to initiating the work. All existing equipment shall remain in operation during the construction except for the minimal down time required for the tie-in or modification of the equipment.

END OF SECTION

DIVISION 16 - ELECTRICAL
SECTION 16050 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1.00 GENERAL

1.01 GENERAL REQUIREMENTS

A. All material furnished shall be new and shall conform to all rules and codes as recommended or adopted by the National Association governing the manufacture, rating and testing of the material. All electrical equipment shall be UL listed for the intended use.

PART 2.00 PRODUCTS

2.01 RACEWAYS AND FITTINGS

A. Raceways permitted on this project shall be hot dipped galvanized rigid aluminum conduit; flexible metallic tubing; liquid-tight flexible metal conduit; and rigid polyvinyl chloride (PVC) conduit. All conduits shall be new and shall bear the inspection label of the Underwriter's Laboratories, Inc.

B. Metallic conduit shall be metalized, or hot-dipped galvanized. Non-metallic conduit shall be schedule 40 PVC.

C. Fittings for conduit shall be an approved type specially designed and manufactured for their purpose. Rigid metal conduit fittings, bushings, and other components shall be galvanized. Setscrew connector fittings shall not be permitted. All fittings for rigid steel or aluminum conduit shall be threaded and coupled unless specifically approved otherwise by the Engineer.

2.02 EXPOSED CONDUIT

A. Exposed conduit shall be firmly supported on galvanized hangers; on brackets, hangers, or pipe straps; or by beam clamps. Conduit installed exposed shall be neatly aligned and run at right angles to the building walls or walls of the rooms in which they are installed. All exposed conduit shall be located to avoid all conflicts with architectural or mechanical components.

2.03 FLEXIBLE CONDUIT

A. Liquid-tight flexible metal conduit shall have a spiral wound, flexible, galvanized steel core and a tough extruded synthetic moisture-tight outer covering. All flexible conduits shall be UL listed and not exceed 24” without engineers approval.

2.04 GALVANIZED CONDUIT

A. Galvanized conduit furnished in accordance with these specifications shall be of Aluminum piping, galvanized inside and outside, and shall conform in all respects to the American Standard Association rigid Aluminum Conduit Specification C80.1-1959 and Underwriter's Laboratories Specifications.

B. The galvanized coat of zinc shall be of uniform thickness applied by the hot-dipped process to not only the inside surfaces of the conduit, but also to the threads of the conduit. It shall be further dipped in a chromic acid bath so as to chemically form a corrosive resistant protective coating of zinc chromate over hot-dipped galvanized surface. Each piece of conduit shall be straight, free from blisters and other debris, cut square and taper reamed, and furnished with coupling in 10 foot length threaded each end. The interior threaded surface of each coupling shall be galvanized to insure 100% galvanic protection on all surfaces. The hot galvanized zinc chromate on the inside and outside surfaces shall be sufficiently elastic to prevent cracking or flaking when sample of finished conduit is bent 90^{o} at a minimum temperature of 60^{o}F, the inner edge of the bend having a radius of six (6) times the inside diameter of the conduit.

2.05 RACEWAYS

A. Lay-in duct, JIC Wireway and troughs shall be NEMA 1 for indoor application and NEMA 4X Stainless Steel for out door or applications exposed to weather or water. Raceways shall be sized as noted on Drawings, and shall have hinged or screw covers with captive screws. Finish shall be gray enamel. All components shall be UL listed for steel enclosed wireway or auxiliary gutter.

2.06 OUTLET AND SWITCH BOXES

A. Outlet boxes in concealed conduit systems shall be flush mounted. Boxes shall be galvanized steel of sufficient size to accommodate devices shown and shall have raised covers where required to meet requirements of NEC Article 314.

B. All boxes shall be stamped, one piece, galvanized steel, of proper size and shape for conduits entering them, and shall be UL listed and NEC approved for the intended use. Boxes shall be installed so that device and/or coverplates shall be tight and plumb with wall finish, have all unused openings closed with knock-out plugs, and be weatherproof for exterior locations.

C. Boxes for lighting fixtures shall be 4 inches octagon, not less than 1 1/2 inches deep, with fixtures stud fastened through from back box. Where boxes are installed in a concrete slab, boxes designed for this application shall be used.

D. Outlet boxes for switches in concealed work shall be standard switch boxes of required number of gangs. Outlet boxes for receptacles, telephone, and communication use in concealed work shall be 4 inch square, not less than 1 1/2 inches deep. Outlet boxes for switches and receptacles installed in exposed conduit system shall be cast type FS or FD, number of gang as required. Outlet boxes for telephone and communication use in exposed systems to be cast, 4 inches square, not less than 1 1/2 inches deep.

E. Boxes shall not to be installed back to back in walls. Offset with connecting conduit as specified. Do not use long, extended boxes that would effectively couple light and sound between adjoining spaces.

2.07 WIRE (600 VOLT AND BELOW)

A. All conductors used in the work shall be of soft drawn annealed copper having a conductivity of not less than 98% of that of pure copper. Conductors shall be standard code gauge in size, insulated and shall have insulation rated for use at 600 volts.

B. Unless noted otherwise or specified, insulation shall be type THW, THWN, or THHN for sizes up to and including No. 2 AWG. Insulation for wire sizes larger than No. 2 AWG shall be type THW, XHHW, or THHN. Lighting fixture wire shall be heat resistant type TF (150^{o}C) with 300-volt insulation minimum. Wires shall be of the single conductor type. Sizes No. 8 AWG and larger shall be stranded. Sizes No. 12 thru No. 14 shall be single strand solid copper.

C. Throughout the system, all conductors shall be identified as to the phase and voltage of the system by color-coding in accordance with NEC 210.5. Color-coding shall be continuous the full length of the wire with surface printing at regular intervals on all conductors and for neutral conductors.

D. Color coding shall be as follows:

3phase 120/240V System
Phase 1-Black
Phase 2-Orange
Phase 3-Blue
Neutral-White
Ground-Green

2.08 GROUND RODS

A. Ground rods shall be continuous rods in length as shown on the Drawings. Rods shall be copperbonded driven rod type. The copper jacket shall be electrolytically bonded to the high strength steel core. Copperbonded ground rods shall meet or exceed requirements of UL Specification No. 467 (ANSI C-33.8-1972).

B. Connections to ground rods shall be with heavy duty bronze ground rod clamps. Clamp shall have hex head set screw.

2.09 WEATHERPROOF RECEPTACLES

A. Weatherproof receptacles shall be GFCI duplex receptacles as specified under WIRING DEVICES, mounted in a cast iron type FD conduit box and fitted with gasketed metal cover with spring. Weatherproof receptacles shall be flush mounted in exterior walls.

2.10 WIRING DEVICES

A. Wiring devices shall be as listed. The color of device shall match color of outlet cover plate. It shall be the responsibility of the Contractor to provide plugs, receptacles and fittings required for any equipment furnished or installed or connected under the contract. Color as selected by the Engineer.

	Leviton	P & S	Hubbell
Toggle Switches: 20A 120/277V			
Single pole	1221-I	20AC1-I	1221-I
Three-way	1223-I	20AC3-I	1223-I
Duplex Receptacle: 20A, 125V,			
NEMA 5 20R	5362-I	5362-I	5363-I
Ground Fault Circuit Interrupter:			
20A, 125V, Feed Through,			
NEMA 5 20R	6899-I	2091-S	GF 5362-I

B. Quad receptacles shall be 20 amp, 125 volt rated, NEMA 5-20R, with two (2) duplex receptacles or single four-plex device.

2.11 OUTLET COVER PLATES

A. Unless otherwise specified, all outlets shall be fitted with cover plates. Cover plates shall be standard size, uniform in design and finish for switches, receptacles and other outlets requiring cover plates. Plates shall be one piece of the required number of gangs. All cover plates shall be stainless steel type. Engineer shall select cover plate color.

2.12 CONDUIT SEAL FITTINGS

A. Conduit seals shall be installed where shown on the drawings. Conduit seals shall be UL listed for use in hazardous locations when Kwiko A Sealing Compound or Crouse-Hinds Chico A Sealing Compound are used to make the seal. Fittings shall be malleable iron construction with galvanized finish, and suitable for use with threaded metal conduit. Fittings shall be installed in accordance with National Electrical Code Article 500 requirements.

PART 3.00 EXECUTION

3.01 WIRING - GENERAL

A. Unless otherwise specified, all wiring shall be installed in conduit. No wire shall be smaller than No. 12 unless noted otherwise. Wiring for low voltage control may be #14 AWG. Wire for each branch circuit shall be of single size and type from the branch circuit protective device the last outlet of the circuit. BX wiring shall not be allowed.

B. Feeders, motor circuit conductors and main service entrance conductors shall run their entire length without joints or splices. Wiring for branch circuits shall run the entire length without splices, with splices and joints made only at outlets or in accessible junction boxes only when absolutely necessary and approved by the Engineer. Joints and splices in branch circuit wiring shall be made with compression type solderless connectors.

C. Connectors of the non-metallic screw on type are not acceptable. Terminations or splices for conductors No. 6 AWG and larger shall utilize bolted connecting lugs. All splices and terminations shall be insulated in an approved manner by an integral or separate cover or

by taping to provide insulating value equal to that of the conductors being joined.

D. Type THW or THWN conductors may be connected directly to recessed fixtures only when the fixtures are equipped with outlet boxes listed by Underwriter's Laboratories, Inc. for use with wire having insulation rated for maximum operating temperatures of 75°C (167°F); otherwise, for fixtures not rated for 75°C directly connection, use 125°C insulated conductors from the fixture to an outlet box placed at least one (1) foot, but not more than four (4) feet from the fixture.

E. Branch circuit home run numbers shown on the drawings shall be used as a guide for connection of circuit wiring to similarly number protective devices in branch circuit panelboards. Requests for changes in the plans shall be directed to the Engineer. No changes shall be made without approval from the Engineer.

F. Each circuit shall be furnished with its own neutral conductor. There shall be no sharing of neutral conductors.

G. In instances where a junction box, wireway, etc. contains three (3) or more branch circuits, the feeders shall be labeled within the junction box, wireway, etc. with circuit location, including panel name and breaker number. Labeling shall be neatly typed and affixed to each feeder. Labeling shall meet all applicable Code requirements.

H. No more than three (3) 20A/1P circuits may be installed in a single conduit. Circuits may not share grounds or neutrals. Conductors sharing raceways shall be derated per table 310.15(B)(3)(a) of the NEC.

3.02 ELECTRICAL SERVICE GROUNDING

A. Main electrical service equipment, conduit work, motors, panelboards and all other electrical equipment shall be effectively and permanently grounded. Grounding connections and conductor sizes shall be in accordance with requirements of the National Electrical Code, Article 250 and local or State ordinances.

B. Provide as part of the service grounding system an ufer ground in the building slab. The ufer ground shall be 20’ long bare #4 copper wire and bonded to the main service ground lug with a grounding electrode cable of the size indicated on the drawings.

C. The building foundation steel and structural steel (if applicable) shall be connected to the service entrance ground lug with a grounding electrode cable of the size indicated on the drawings.

D. All ground lugs shall be properly torqued, as per the gear manufacturer’s instructions and provide pictures of all ground connections to the Engineer for inspection before they are covered.

E. All grounding connections shall be mechanically made. Cadweld style connections are not permitted.

3.03 EQUIPMENT GROUNDING

A. All conduit entering panelboards shall be grounded to the panelboard by means of a grounding type locknut installed on the instead o the panelboard. Where the continuity of the metallic conduit system is interrupted by a section of non-metallic conduit, as separate grounding conductor, sized in accordance with NEC table 250.122 shall be installed in the conduit with the insulated conductors. A separate grounding conductor, as described above or as called for on the plans, shall be run in the conduit with the circuit conductors for all circuits serving multi-outlet assemblies.

B. Conduit runs shall be increased in size where necessary to accommodate the grounding conductor in addition to circuit conductors. The grounding screw on all grounding type receptacles shall be securely grounded to the outlet box using a No. 12 green insulated conductor attached to the outlet box with lug screw.

C. The grounding screw on all grounding type receptacles shall be security grounded to the outlet box using a No. 12 green insulated conductor attached to the outlet box with lug screw. Ground screws shall be green.

D. All switch legs shall include a green ground conductor connected to the circuit ground conductor and terminated in the switch outlet box.

3.04 CONDUIT - MATERIALS AND METHODS

A. Conduit shall be installed as per NEC and NEMA regulations and the manufacturer's recommendations. Conduit shall be as follows:

B. Rigid Aluminum Conduit shall be used for all conduits exposed to the weather, and underground conduit except where non-metallic conduit is specified or approved. Underground and under slab runs are to be watertight. All horizontal runs of underground conduit shall utilize rigid Aluminum elbows on vertical risers.

C. All conduits routed underground shall not be placed in building slab. Conduits larger than 1" routed under building slab shall be routed below the vapor barrier. Minimum conduit size allowed to be routed underground shall be 3/4". Conduits routed under building slab may be PVC. All conduits rising vertically out of slab or out of ground shall be rigid steel.

D. Non-metallic conduit, minimum schedule 40 PVC, shall be permitted to be installed underground. Non-metallic conduit shall not be used in any environmental air plenum. If PVC conduit is run, a full sized grounding conductor shall be pulled with the circuit conductors. PVC conduit shall not be run exposed. Where PVC conduit is run underground, it shall be encased in concrete or run minimum 24" below grade, or at the depth below grade shown on the drawings.

E. Flexible metal conduit or liquid-tight flexible metal conduit shall be used for the final connection of runs to motors. Flexible conduit shall be at least twelve (12) inches, but not more than 24 inches long without engineers approval. Where used, an external grounding conductor shall be run with conduit unless conductor is made as a part of the conduit.

3.05 CONDUIT - GENERAL

A. Fittings for rigid Aluminum conduits shall be hot-dipped galvanized Aluminum and shall be of a type especially designed and manufactured for their purpose. Rigid conduit joints for single conduit runs shall be made with threaded fittings made tight with at least five threads fully engaged. Fittings for rigid non-metallic conduit shall be solvent welded.

B. Where they enter boxes or cabinets that do not have threaded hubs, conduits shall be secured in place with galvanized locknuts inside and outside the cabinet and shall have bushings inside. Conduits larger than 1-1/4 inch shall have galvanized locknuts and galvanized bushings.

C. All conduits shall be installed concealed or as indicated or scheduled on the drawings and shall be of sufficient size to accommodate the required number of insulated conductors including equipment grounding conductor where such grounding conductor is required or specified.

D. Conduit runs shall be straight; elbows and bends shall be uniform, symmetrical and free from dents or flattening. Exposed conduits shall be installed with runs parallel or perpendicular to walls, ceilings or structural members and shall be located to avoid any conflicts with ceiling inserts.

E. All conduits shall be cut square and reamed at the ends. The conduit system shall be complete and cleaned before any conductors are installed. Open ends of all conduits shall be capped until conductors are installed. A non-metallic fish wire shall be installed in all empty conduits. Empty conduit shall remain capped.

F. Contractor shall refer to National Electrical Code Appendix C, Conduit and Tubing Fill Tables for Conductors and Fixture Wire of the Same Size. Contractor shall refer to the appropriate table for the conduit and wire condition and shall install wiring in accordance with code requirements.

3.06 SUPPORTS AND FITTINGS

A. The Contractor shall furnish and install all supports for equipment under this contract. Supports shall be spaced at intervals of eight (8) feet maximum for rigid conduit as necessary to obtain rigid support. Perforated strap supports will not be permitted.

B. All conduits shall be firmly secured with pipe clamps, conduit straps, or suspension hangers as appropriate. Fasten to steel with screws in tapped holes, to wood with wood screws, and to masonry with expansion anchors. Expansion anchors shall have a minimum pull out load of 1,200 pounds and an ultimate shear load of 1,950 pounds.

C. All conduit, fixtures, and accessories shall be rigidly supported to form a firm, well-braced installation.

E. Joints shall be made tight with standard galvanized or sheradized couplings; corners turned with fittings, elbows, or long radius bends.

F. Setscrew conduit fittings shall not be permitted.

3.07 FLEXIBLE CONDUIT

A. Flexible metal conduit may be used for short final connections to equipment where permitted by governing codes. Flexible metal conduit shall be sized and supported in accordance with Article 350 of the NEC or more stringent local codes. A separate equipment-grounding conductor sized in accordance with NEC Table 250.122 shall be installed in flexible conduit unless exceptions are allowed by governing codes and if the fittings used are UL listed for the purpose.

B. Liquid-tight flexible metal conduit shall be used where flexible conduit is permitted and desired and conditions of installation, operation, or maintenance require protection from liquids, vapors, or solids and in other hazardous locations where specifically approved. Flexible conduit for all exterior motor connections shall be liquid tight. Liquid-tight flexible conduit shall be used with terminal fittings approved for the purpose.

3.08 WEATHERPROOF EQUIPMENT

A. All disconnect switches, starters, and other electrical equipment located on the exterior of the building or exposed to the outside shall be enclosed in a NEMA 4X Stainless Steel enclosure. All lighting fixtures or other devices located on an exterior wall of the building shall be mounted on a flush-mounted, cast outlet box.

B. All lighting fixtures or other devices located on an exterior wall of the building shall be mounted on a flush-mounted, cast outlet box.

3.09 UNDERGROUND CONDUIT

A. Conduit run underground shall be routed at least 24" below top of grade. Conduit shall be securely supported on plastic spacers placed at intervals of 4' maximum and tied in place securely. Maintain 2" separation between conduits. Conduit joints shall be made up watertight to prevent the entrance of moisture. Provide warning tape approximately 12" above buried conduits.

B. Horizontal portions of conduit installed underground 1" and larger may be schedule 40 PVC plastic. Vertical portions of underground conduit shall be rigid galvanized Aluminum with an approved metallic bushing at point of entry. Termination elbows shall be rigid galvanized Aluminum installed using a plastic-to-metal adapter. A full sized copper, grounding conductor shall be provided for the full length of each non-metallic conduit, terminated with an accessible connection to a ground lug on the cabinet or Aluminum conduit extension.

3.10 WEATHERPROOF EQUIPMENT

A. All disconnect switches, starters, and other electrical equipment located on the exterior of the building or exposed to the outside shall be enclosed in a rain-tight enclosure.

B. All lighting fixtures or other devices located on an exterior wall of the building shall be

mounted on a flush-mounted, cast outlet box.

3.11 MOUNTING HEIGHTS

A. Unless otherwise noted on the drawings, the following mounting heights apply:

Receptacles	4'-0"
Toggle Switches	4'-0"
Panelboards	6'-0" to top
Safety Switches	5'-0" to top
Motor Control Equipment	5'-0" to top

B. Under permission of the Engineer, mounting heights may be adjusted to facilitate equipment arrangements. Dimensions above refer to the centerline of the device unless noted otherwise.

3.12 HOUSE KEEPING PADS

A. All floor and ground mounted electrical equipment - panels, switchboards, motor control centers, transformers, etc. shall be installed with a reinforced concrete housekeeping pad, whether shown on the drawings or not. The pad shall extend 4" above either the finished floor or final grade (as applicable), have 45 degree chamfered edges, and be constructed of 3000psi concrete. The pad shall extend 3" beyond the edge of the respective electrical equipment.

END OF SECTION

DIVISION 16 – ELECTRICAL
SECTION 16200 - STANDBY POWER GENERATOR

PART 1.00 GENERAL

1.01 DESCRIPTION OF SYSTEM

A. Provide a standby power system to supply electrical power in event of failure of normal supply, consisting of a liquid cooled engine, an AC alternator and system controls with all necessary accessories for a complete operating system, including but not limited to the items as specified hereinafter.

B. Provide an automatic transfer switch described elsewhere in this specification so that the system comes on-line fully automatically, and on restoration of utility power automatically retransfers load to normal power, shuts down the generator and returns to readiness for another operating cycle.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

A. The electric generating system consists of a prime mover, generator, governor, coupling and all controls which must have been tested as a complete unit.

B. Conform to current edition of the NEC and applicable inspection authorities.

C. Transfer switch to be labeled under UL 1008.

1.03 QUALITY ASSURANCE

A. This system shall be supplied by a manufacturer who has been regularly engaged in the production of engine-alternator sets, automatic transfer switches, and associated controls for a minimum of ten years, so there is one source of supply and responsibility.

B. The manufacturer shall have printed literature and brochures describing the standard series specified, not a one of kind fabrication.

C. The manufacturer shall maintain an authorized service center within 75 miles of the Project site, capable of providing training, parts, and emergency repairs.

D. The basis for this specification is Cummins Power Generation equipment; approved equals may be considered if equipment performance is shown to meet the requirements herein.

1.04 WARRANTY

A. Base Warranty: Manufacturer shall provide base warranty coverage on the material and workmanship of the generator set for a minimum of twenty-four (24) months for Standby product from registered commissioning and start-up.

1.05 SUBMITTALS

A. Product Data: For each type of packaged engine generator indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. In addition, include the following:
   1. Thermal damage curve for generator.
   2. Time-current characteristic curves for generator protective device.
   3. Sound test data, based on a free field requirement.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, and location and size of each field connection.
   1. Dimensioned outline plan and elevation drawings of engine-generator set and other components specified.
   2. Wiring Diagrams: Control interconnection, Customer connections.

C. Certifications:
   1. Submit statement of compliance which states the proposed product(s) is certified to the emissions standards required by the location for EPA, stationary emergency application.

D. Warranty:
   1. Submit manufacturer's warranty statement to be provided for this Project.

PART 2.00 PRODUCTS

2.01 ENGINE-GENERATOR SET

A. Factory-assembled and -tested, engine-generator set.

B. Mounting Frame: Maintain alignment of mounted components without depending on concrete foundation; and have lifting attachments.
   1. Rigging Information: Indicate location of each lifting attachment, generator-set center of gravity, and total package weight in submittal drawings.

C. Capacities and Characteristics:
   1. Power Output Ratings: Electrical output power rating for Standby operation of not less than 150kW, at 80 percent lagging power factor, 120/240V Wye, Three phase, 4-wire, 60 hertz for the Faubourg site. Electrical output power rating for Standby operation of not less than 50kW, at 80 percent lagging power factor, 120/240V Wye, Three phase, 4-wire, 60 hertz for the Post Oak site.
   2. Alternator shall be capable be capable of recovering to a minimum of 90% of rated no load voltage. Following the application of the specified kVA load at near zero power factor applied to the generator set.
   3. Nameplates: For each major system component to identify manufacturer's name and address, and model and serial number of component. The engine-generator nameplate shall include information of the power output rating of the equipment.

D. Generator-Set Performance:

1. Steady-State Voltage Operational Bandwidth: 1.0 percent of rated output voltage from no load to full load.
2. Transient Voltage Performance: Not more than 11 percent variation for 50 percent step-load increase or decrease. Voltage shall recover and remain within the steady-state operating band within 3 seconds. On application of a 100% load step the generator set shall recover to stable voltage within 10 seconds.
3. Steady-State Frequency Operational Bandwidth: 0.5 percent of rated frequency from no load to full load.
4. Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operational band and no hunting or surging of speed.
5. Transient Frequency Performance: Not more than 4 percent variation for 50 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within 1 seconds. On application of a 100% load step the generator set shall recover to stable frequency within 10 seconds.
6. Output Waveform: At full load, harmonic content measured line to line or line to neutral shall not exceed 5 percent total and 3 percent for any single harmonic. Telephone influence factor, determined according to NEMA MG 1, shall not exceed 50.
7. Sustained Short-Circuit Current: (For engine-generator sets using a PMG-excited alternator) For a 3-phase, bolted short circuit at system output terminals, system shall supply a minimum of 300 percent of rated full-load current for not less than 8 seconds without damage to generator system components. For a 1- phase, bolted short circuit at system output terminals, system shall regulate both voltage and current to prevent over-voltage conditions on the non-faulted phases.
8. Start Time: Comply with NFPA 110, Level 1, Type 10, system requirements.
9. Ambient Condition Performance: Engine generator shall be designed to allow operation at full rated load in an ambient temperature under site conditions, based on highest ambient condition. Ambient temperature shall be as measured at the air inlet to the engine generator for enclosed units, and at the control of the engine generator for machines installed in equipment rooms.

2.02 ENGINE

A. Fuel: Natural Gas

B. Rated Engine Speed: 1800RPM.

C. Lubrication System: The following items are mounted on engine or skid:
1. Lube oil pump: shall be positive displacement, mechanical, full pressure pump.
2. Filter and Strainer: Provided by the engine manufacturer of record to provide adequate filtration for the prime mover to be used.
3. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps, siphons, special tools, or appliances.

D. Engine Fuel System: The engine fuel system shall be installed in strict compliance to the engine manufacturer's instructions

E. Coolant Jacket Heater: Electric-immersion type, factory installed in coolant jacket system. Comply with NFPA 110 requirements for Level 1 equipment for heater capacity and performance.
   1. Designed for operation on a single 120 VAC, Single phase, 60Hz power connection. Heater voltage shall be shown on the project drawings.
   2. Installed with isolation valves to isolate the heater for replacement of the element without draining the engine cooling system or significant coolant loss.
   3. Provided with a 12VDC thermostat, installed at the engine thermostat housing

F. Governor: Adjustable isochronous, with speed sensing. The governing system dynamic capabilities shall be controlled as a function of engine coolant temperature to provide fast, stable operation at varying engine operating temperature conditions. The control system shall actively control the fuel rate as appropriate to the state of the engine generator. Fuel rate shall be regulated as a function of starting, accelerating to start disconnect speed, accelerating to rated speed, and operating in various isochronous states.

G. Cooling System: Closed loop, liquid cooled
   1. The generator set manufacturer shall provide prototype test data for the specific hardware proposed demonstrating that the machine will operate at rated standby load in an outdoor ambient condition of 50 deg C.
   2. Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.
   3. Size of Radiator overflow tank: Adequate to contain expansion of total system coolant from cold start to 110 percent load condition.
   4. Expansion Tank: Constructed of welded steel plate and rated to withstand maximum closed-loop coolant system pressure for engine used. Equip with gage glass and petcock.
   5. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.
   6. Duct Flange: Generator sets installed indoors shall be provided with a flexible radiator duct adapter flange.

H. Muffler/Silencer: Selected with performance as required to meet sound requirements of the application, sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure requirements. For generator sets with outdoor enclosures the silencer shall be inside the enclosure.

I. Air-Intake Filter: Engine-mounted air cleaner with replaceable dry-filter element and restriction indicator.

J. Starting System: 12 or 24V, as recommended by the engine manufacturer; electric, with negative ground.
   1. Components: Sized so they will not be damaged during a full engine-cranking cycle with ambient temperature at maximum specified in Part 1 "Project Conditions" Article.

2. Cranking Cycle: As required by NFPA 110 for level 1 systems.

3. Battery Cable: Size as recommended by engine manufacturer for cable length as required. Include required interconnecting conductors and connection accessories.
4. Battery Compartment: Factory fabricated of metal with acid-resistant finish.
5. Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation. The battery charging alternator shall have sufficient capacity to recharge the batteries with all parasitic loads connected within 4 hours after a normal engine starting sequence.
6. Battery Chargers: Unit shall comply with UL 1236, provide fully regulated, constant voltage, current limited, battery charger for each battery bank. It will include the following features:
    a. Operation: Equalizing-charging rate based on generator set manufacturer's recommendations shall be initiated automatically after battery has lost charge until an adjustable equalizing voltage is achieved at battery terminals. Unit shall then be automatically switched to a lower float-charging mode and shall continue to operate in that mode until battery is discharged again.
    b. Automatic Temperature Compensation: Adjust float and equalize voltages for variations in ambient temperature from minus 20 deg C to plus 40 deg C to prevent overcharging at high temperatures and undercharging at low temperatures.
    c. Automatic Voltage Regulation: Maintain constant output voltage regardless of input voltage variations up to plus or minus 10 percent.
    d. Safety Functions: Sense abnormally low battery voltage and close contacts providing low battery voltage indication on control and monitoring panel. Sense high battery voltage and loss of ac input or dc output of battery charger. Either condition shall close contacts that provide a battery-charger malfunction indication at system control and monitoring panel.
    e. Provide LED indication of general charger condition, including charging, faults, and modes. Provide a LCD display to indicate charge rate and battery voltage. Charger shall provide relay contacts for fault conditions as required by NFPA110.
    f. Enclosure and Mounting: NEMA, Type 1, wall-mounted cabinet.

2.03 CONTROL AND MONITORING

A. Engine generator control shall be microprocessor based and provide automatic starting, monitoring, protection and control functions for the unit.

B. Automatic Starting System Sequence of Operation: When mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in one or more separate automatic transfer switches initiate starting and stopping of generator set. When mode-selector switch is switched to the on position, generator set starts. The off position of same switch initiates generator-set shutdown. (Switches with different configurations but equal functions are acceptable.) When generator set is running, specified system or equipment failures or derangements automatically shut down

generator set and initiate alarms. Operation of the local (generator set-mounted) and/or remote emergency-stop switch also shuts down generator set.

C. Manual Starting System Sequence of Operation: Switching on-off switch on the generator control panel to the on position starts generator set. The off position of same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms. Operation of the local (generator set-mounted) and/or remote emergency-stop switch also shuts down generator set.

D. Configuration: Operating and safety indications, protective devices, system controls, engine gages and associated equipment shall be grouped in a common control and monitoring panel. Mounting method shall isolate the control panel from generator-set vibration. AC output power circuit breakers and other output power equipment shall not be mounted in the control enclosure.

E. Indicating and Protective Devices and Controls: As required by NFPA 110 for Level 1 system, and the following:
   1. AC voltmeter (3-phase, line to line and line to neutral values).
   2. AC ammeter (3-phases).
   3. AC frequency meter.
   4. AC kVA output (total and for each phase). Display shall indicate power flow direction.
   5. Ammeter-voltmeter displays shall simultaneously display conditions for all three phases.
   6. Emergency Stop Switch: Switch shall be a red “mushroom head” pushbutton device complete with lock-out/tag-out provisions. Depressing switch shall cause the generator set to immediately stop the generator set and prevent it from operating.
   7. Fault Reset Switch: Supply a dedicated control switch to reset/clear fault conditions.
   8. DC voltmeter (alternator battery charging).
   9. Engine-coolant temperature gage.
   10. Engine lubricating-oil pressure gage.
   11. Running-time meter.
   12. Generator-voltage and frequency digital raise/lower switches. Rheostats for these functions are not acceptable. The control shall adjustment of these parameters in a range of plus or minus 5% of the voltage and frequency operating set point (not nominal voltage and frequency values.)
   13. AC Protective Equipment: The control system shall include over/under voltage, over current, short circuit, loss of voltage reference, and over excitation shut down protection. There shall be an overload warning, and overcurrent warning alarm.
   14. Status LED indicating lamps to indicate remote start signal present at the control, existing alarm condition, not in auto, and generator set running.
   15. A graphical display panel with appropriate navigation devices shall be provided to view all information noted above, as well as all engine status and alarm/shutdown conditions (including those from an integrated engine emission control system).

The display shall also include integrated provisions for adjustment of the gain and stability settings for the governing and voltage regulation systems.

16. Panel lighting system to allow viewing and operation of the control when the generator room or enclosure is not lighted.
17. DC control Power Monitoring: The control system shall continuously monitor DC power supply to the control, and annunciate low or high voltage conditions. It shall also provide an alarm indicating imminent failure of the battery bank based on degraded voltage recover on loading (engine cranking).

F. Common Remote Audible Alarm: Comply with NFPA 110 requirements for Level 1 systems. Include necessary contacts and terminals in control and monitoring panel.
1. Overcrank shutdown.
2. Coolant low-temperature alarm.
3. Control switch not in auto position.
4. Battery-charger malfunction alarm.
5. Battery low-voltage alarm.

G. Remote Alarm Annunciator: Comply with NFPA 110. An LED labeled with proper alarm conditions shall identify each alarm event and a common audible signal shall sound for each alarm condition.

2.04 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

A. Comply with NEMA MG 1.

B. Drive: Generator shaft shall be directly connected to engine shaft. Exciter shall be rotated integrally with generator rotor.

C. Electrical Insulation: Class H

D. Temperature Rise: 105 / Class H environment.

E. Construction shall prevent mechanical, electrical, and thermal damage due to vibration, over speed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.

F. Permanent Magnet Generator (PMG) shall provide excitation power for optimum motor starting and short circuit performance.

G. Enclosure: Drip-proof.

H. Voltage Regulator: SCR type, Separate from exciter, providing performance as specified. The voltage regulation system shall be microprocessor-controlled, full wave rectified, and provide a pulse-width modulated signal to the exciter. No exceptions or deviations to these requirements will be permitted.

I. The alternator shall be provided with anti-condensation heater(s) in all applications where the generator set is provided in an outdoor enclosure, or when the generator set is installed in a coastal or tropical environment.

J. Windings: Two-thirds pitch stator winding and fully linked amortisseur winding.

K. Subtransient Reactance: 15 percent maximum, based on the rating of the engine generator set.

2.05 OUTDOOR GENERATOR-SET ENCLOSURE

A. Description: Sound Attenuated Aluminum housing. Multiple panels shall be lockable and provide adequate access to components requiring maintenance. Instruments, control, and battery system shall be mounted within enclosure.

B. Construction:
1. Hinged Doors: With padlocking provisions. Restraint/Hold back hardware to prevent door to keep door open at 180 degrees during maintenance. Rain lips over all doors.
2. Exhaust System:
   a. Muffler Location: Within enclosure.
3. Hardware: All hardware and hinges shall be stainless steel.
4. Wind Rating: Wind rating shall be 150 mph
5. Mounting Base: Suitable for mounting on housekeeping pad.
6. A weather protective enclosure shall be provided which allows the generator set to operate at full rated load with a static pressure drop equal to or less than 0.5 inches of water.

C. Engine Cooling Airflow through Enclosure: Housing shall provide ample airflow for engine generator operation at rated load in an ambient temperature of 50 deg C.

D. Sound Performance: Reduce the sound level of the engine generator while operating at full rated load to a maximum of 72 dBA measured at any location 7 m from the engine generator in a free field environment.

E. Site Provisions:
1. Lifting: Complete assembly of engine generator, enclosure shall be designed to be lifted into place as a single unit, using spreader bars.

2.06 VIBRATION ISOLATION DEVICES

A. Vibration Isolation: Generators installed on grade shall be provided with elastomeric isolator pads integral to the generator, unless the engine manufacturer requires use of spring isolation.

2.07 FINISHES

A. Indoor and Outdoor Enclosures and Components: Powder-coated and baked over corrosion-resistant pretreatment and compatible primer. Manufacturer's standard color or as directed on the drawings.

2.08 SOURCE QUALITY CONTROL

A. Prototype Testing: Factory test engine-generator set using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.
   1. Tests: Comply with NFPA 110, Level 1 Energy Converters. In addition, the equipment engine, skid, cooling system, and alternator shall have been subjected to actual prototype tests to validate the capability of the design under the abnormal conditions noted in NFPA110. Calculations and testing on similar equipment which are allowed under NFPA110 are not sufficient to meet this requirement.

B. Project-Specific Equipment Tests: Before shipment, factory test engine-generator set manufactured specifically for this Project. Perform tests at rated load and power factor. Include the following tests:
   1. Test engine generator set manufactured for this Project to demonstrate compatibility and functionality.
   2. Full load run.
   3. Maximum power.
   4. Voltage regulation.
   5. Steady-state governing.
   6. Single-step load pickup.
   7. Simulated safety shutdowns.
   8. Provide 14 days' advance notice of tests and opportunity for observation of tests by Owner's representative.

2.09 AUTOMATIC TRANSFER SWITCH

A. The automatic transfer switch shall be furnished by the manufacturer of the engine-generator set so as to maintain system compatibility and local service responsibility for the complete emergency power system. It shall be listed by Underwriter's Laboratory, Standard 1008 with circuit breaker protection. Representative production samples of the transfer switch supplied shall have demonstrated through tests the ability to withstand at least 10,000 mechanical operation cycles. One operation cycle is the electrically operated transfer from normal to emergency and back to normal. Wiring must comply with NEC table 373-6(b). The manufacturer shall furnish schematic and wiring diagrams for the particular automatic transfer switch and a typical wiring diagram for the entire system.

B. The automatic transfer switch shall be rated for 600 amperes continuous operation at the Faubourg site and 125 amperes continuous operation at the Post Oak site in ambient temperatures of -40 Degrees Fahrenheit (-40 Degrees Celsius) to +122 Degrees Fahrenheit (+50 Degrees Celsius) and shall be service entrance listed. Main power switch contacts shall be rated for 240 Volt AC minimum. Where the line side overcurrent

protection is provided by circuit breakers, the short circuit withstand and closing ratings shall be 65,000 amperes RMS. These RMS symmetrical fault current ratings shall be the rating listed in the UL listing or component recognition procedures for the transfer switch. All withstand tests shall be performed with the overcurrent protective devices located external to the transfer switch.

C. The transfer switch shall be double throw construction, positively electrically and mechanically interlocked to prevent simultaneous closing and mechanically held in both normal and emergency positions. Independent break before make action shall be used to positively prevent dangerous source to source connections. When switching the neutral, this action prevents the objectionable ground currents and nuisance ground fault tripping that can result from overlapping designs. The transfer switch shall be approved for manual operation. The electrical operating means shall be by electric solenoid. Every portion of the contactor is to be positively mechanically connected. No clutch or friction drive mechanism is allowed, and parts are to be kept to a minimum. This transfer switch shall not contain integral overcurrent devices in the main power circuit, including molded case circuit breakers or fuses.

D. The transfer switch electrical actuator shall have an independent disconnect means to disable the electrical operation during manual switching. Maximum electrical transfer time in either direction shall be 160 milliseconds, exclusive of time delays. Main switch contacts shall be high pressure silver alloy contacts to resist burning and pitting for long life operation.

E. There shall be two SPDT, 10 ampere, 250 volt auxiliary switches on both normal and emergency sides, operated by the transfer switch. Full rated neutral bar with lugs for normal, emergency and load conductors shall be provided inside the cabinet.

F. All control equipment shall be mounted on the inside of the cabinet door in a metal lockable enclosure with transparent safety shield to protect all solid state circuit boards. This will allow for ease of service access when main cabinet lockable door is open, but to prevent access by unauthorized personnel. Control boards shall have installed cover plates to avoid shock hazard while making control adjustments. The solid state voltage sensors and time delay modules shall be plug-in circuit boards with silver or gold contacts for ease of service.

G. A solid state undervoltage sensor shall monitor all phases of the normal source and provide adjustable ranges for field adjustments for specific application needs. Pick-up and drop-out settings shall be adjustable from a minimum of 70% to a maximum of 95% of nominal voltage. A utility sensing interface shall be used, stepping down line voltage to 24VAC, helping to protect the printed circuit board from voltage spikes and increasing personnel safety when troubleshooting.

H. The control unit shall signal the engine-generator set to start in the event of a power interruption. A set of contacts shall close to start the engine and open for engine shutdown. A solid state time delay start (adjustable, .1 to 10 seconds) shall delay this signal to avoid nuisance start-ups on momentary voltage dips or power outages.

I. The control units shall transfer the load to the engine-generator set after it reaches proper voltage and frequency. A solid state time delay (adjustable, 5 seconds-3 minutes) shall delay this transfer to allow the engine-generator to warm-up before application of load. There shall be a switch to bypass this warm-up timer when immediate transfer is required.

J. The controller shall retransfer the load to the line after normal power restoration. A return to utility timer (adjustable, 1-30 minutes) shall delay this transfer to avoid short term normal power restoration.

K. The operating power for transfer and retransfer shall be obtained from the source to which the load is being transferred. Controls shall provide an automatic retransfer of the load from emergency to normal if the emergency source fails with the normal source available.

L. The control shall signal the engine-generator to stop after the load retransfers to normal. A solid state engine cool down timer (adjustable, 1-30 minutes) shall permit the engine to run unloaded to cool down before shutdown.

M. Provide an engine minimum run timer (adjustable, 5-30 minutes) to ensure an adequate engine run period.

N. Provide a solid state plant exercise clock to start the generator set exercise period. Clock shall have a one week cycle and be powered by the load side of the transfer switch. A battery must be supplied to maintain the circuit board clock operation when the load side of the transfer switch is de-energized. Include a switch to select if the load will transfer to the engine-generator set during the exercise period.

O. Control shall include a digital display interface enabling the operator to establish unit exercise time within a twenty four hour period. Additional switch settings enable any combination of days within a week for unit exercise. This control is completely self-contained, eliminating the need for the operator to handle pins and jumper wires.

P. Front mounted controls shall include a selector switch to provide for a NORMAL TEST mode with full use of time delays, FAST TEST mode which bypasses all time delays to allow for testing the entire system in less than one minute, or AUTOMATIC mode to set the system for normal operation.

Q. Provide bright lamps to indicate the transfer switch position in either UTILITY (white) or EMERGENCY (red). A third lamp is needed to indicate STANDBY OPERATING (amber). These lights must be energized from utility or the engine-generator set.

R. Provide a manual operating handle to allow for manual transfer. This handle must be mounted inside the lockable enclosure so accessible only by authorized personnel.

S. Provide LED status lights to give a visual readout of the operating sequence. This shall include utility on , engine warmup, engine warmup bypass, standby voltage "ready", standby frequency "ready", standby on, transfer to standby, inphase monitor, time delay neutral, return to utility, engine cool down, engine minimum run and fast test mode.

T. The transfer switch mechanism and controls are to be mounted in a NEMA 4X enclosure.

PART 3.00 EXECUTION

3.01 INSTALLATION

A. Comply with packaged engine-generator manufacturers' written installation, application, and alignment instructions and with NFPA 110.

B. Equipment shall be installed by the contractor in accordance with final submittals and contract documents. Installation shall comply with applicable state and local codes as required by the authority having jurisdiction. Install equipment in accordance with manufacturer's instructions and instructions included in the listing or labeling of UL listed products.

C. Installation of equipment shall include furnishing and installing all interconnecting wiring between all major equipment provided for the on-site power system. The contractor shall also perform interconnecting wiring between equipment sections (when required), under the supervision of the equipment supplier.

D. Equipment shall be installed on concrete housekeeping pads. Equipment shall be permanently fastened to the pad in accordance with manufacturer’s instructions and seismic requirements of the site.

E. Equipment shall be initially started and operated by representatives of the manufacturer. All protective settings shall be adjusted as instructed by the consulting engineer.

F. All equipment shall be physically inspected for damage. Scratches and other installation damage shall be repaired prior to final system testing. Equipment shall be thoroughly cleaned to remove all dirt and construction debris prior to initial operation and final testing of the system.

G. On completion of the installation by the electrical contractor, the generator set supplier shall conduct a site evaluation to verify that the equipment is installed per manufacturer’s recommended practice.

3.02 ON-SITE ACCEPTANCE TEST

A. The complete installation shall be tested to verify compliance with the performance requirements of this specification following completion of all site work. Testing shall be conducted by representatives of the manufacturer, with required fuel supplied by Contractor. The Engineer shall be notified in advance and shall have the option to witness the tests. The generator set manufacturer shall provide a site test specification covering the entire system. Tests shall include:

B. Prior to start of active testing, all field connections for wiring, power conductors, and bus bar connections shall be checked for proper tightening torque.

C. Installation acceptance tests to be conducted on site shall include a "cold start" test, a two hour full load (resistive) test, and a one-step rated load pickup test in accordance with NFPA 110. Provide a resistive load bank and make temporary connections for full load test, if necessary.

D. Perform a power failure test on the entire installed system. This test shall be conducted by opening the power supply from the utility service and observing proper operation of the system for at least 2 hours. Coordinate timing and obtain approval for start of test with site personnel.

3.03 TRAINING

A. The equipment supplier shall provide training for the facility operating personnel covering operation and maintenance of the equipment provided. The training program shall be not less than 4 hours in duration and the class size shall be limited to 5 persons. Training date shall be coordinated with the facility owner.

3.04 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

3.05 SERVICE AND SUPPORT

A. The generator set supplier shall maintain service parts inventory for the entire power system at a central location which is accessible to the service location 24 hours per day, 365 days per year. The inventory shall have a commercial value of $3 million or more. The manufacturer of the generator set shall maintain a central parts inventory to support the supplier, covering all the major components of the power system, including engines, alternators, control systems, paralleling electronics, and power transfer equipment.

B. The generator set shall be serviced by a local service organization that is trained and factory certified in generator set service. The supplier shall maintain an inventory of critical power system replacement parts in the local service location. Service vehicles shall be stocked with critical replacement parts. The service organization shall be on call 24 hours per day, 365 days per year. The service organization shall be physically located within 50 of the site.

C. The manufacturer shall maintain model and serial number records of each generator set provided for at least 20 years.

END OF SECTION

DIVISION 16 - ELECTRICAL
SECTION 16400 - SERVICE AND DISTRIBUTION

PART 1.00 GENERAL

1.01 SYSTEM VOLTAGE

A. The service shall be rated 120/240 Volt, 3-phase, 4-wire as shown on the Drawings.

1.02 TERMINATIONS

A. All wiring shall be sized based on 75^{o}C rated conductors. All connectors shall be rated for 75^{o}C in accordance with N.E.C. Article 110-14 requirements.

PART 2.00 PRODUCTS

2.01 SAFETY SWITCHES

A. Furnish and install safety switches as shown on the Drawings. All switches shall be fused NEMA 4X Stainless Steel Heavy Duty Type HD and Underwriter's Laboratories listed. All switches shall have blades that are fully visible in the "OFF" position with the door open. Switches shall be dead-front construction with permanently attached arc suppressers. Lugs shall be UL listed for copper and aluminum conductor and front removable. All current carrying parts shall be plated to resist corrosion. Switches shall be quick-make, quick-break type. During operation of the switch, the movable contacts shall not be able to be restrained by the handle once the closing or the opening action of the contacts has been initiated. Switches shall have cover interlocks to prevent opening of the switch door while the switch is in the "ON" position or closing the switch with the door open. Switch shall have padlocking capabilities in the "OFF" position.

B. Safety switches shall be rated 600 volts for 480 volt service and rated 240 volts for 208 volt service. Switches shall be motor rated when used for motor loads. Switches shall be NEMA 1 enclosed for indoor applications and NEMA 4X Stainless Steel for outdoor or wet area locations.

C. Switches used for service entrance shall be service entrance rated. Safety switches shall be furnished complete with fuses.

D. Safety switches shall be Square D Heavy Duty Class 3110 type, Eaton Heavy Duty type, or prior approved equal.

2.02 FUSES

A. All fuse holders shall be provided with dual-element, time-lag fuses as scheduled on the Drawings or as recommended by the equipment manufacturer. Fuses shall be rated 200,000 AIC. Fuses shall be Buss Fusetron, Economy Econ, or Gould Shawmut Tri-Onic for component protection and Buss Limitron, Economy Econolin, or Gould Shawmut Amp-Trap for circuit protection.

2.03 CIRCUIT BREAKER PANELBOARDS

A. Panelboards shall be sized as shown on the drawings and schedules, and shall be the bolted breaker panelboard type. Panelboards shall have copper bussing. Loadcenters shall not be permitted.

B. All branch breakers are to be quick-make, quick-break (over center toggle device) with trip indication and common trip on all multiple breakers. Trip indication shall be clearly shown by breaker handle taking a position between "ON" and "OFF" position. Breakers shall be ambient compensated to carry full NEC load in 120 degree F room temperature. Panelboards shall have distributed phase busing throughout. Any two adjacent single pole breakers shall be replaceable by a two pole breaker, and any three adjacent single pole breakers shall be replaceable by a three pole breaker.

C. Minimum interrupting capacity of breakers shall be as shown on panel schedules. No breakers shall be rated less than 10,000 RMS symmetrical amperes.

D. Branch breakers shall be numbered 1, 3, 5, etc. from top to bottom beginning at the top of the left hand column so that #1 shall be on phase A, #3 on phase B, and #5 on phase C.

E. All breakers shall be bolt on type. Panelboards for 120/208 volt or 120/240 volt service shall be Square D type NQ, Eaton Pow-R-Line series, or prior approved equal. Panelboards for 277/480 volt service shall be Square D type NEHB, Eaton Pow-R-Line series, or prior approved equal.

PART 3.00 EXECUTION

3.01 COORDINATION

A. Contractor shall coordinate all service and distribution work with other crafts on the project.

3.02 TEST AND BALANCING

A. At such times as the Architect directs, the Contractor shall conduct in the Architect's presence operating tests to demonstrate the electrical systems are installed and will operate properly and in accordance with the requirements of the specifications. The Contractor shall furnish instruments and personnel required for such tests. Any work that is found to be defective, or material that are found to vary from the requirements of the drawings or specifications shall be replaced by the Contractor without additional cost of the Owner.

3.03 EMERGENCY CIRCUITS

A. All wiring for emergency power and lighting circuits shall be run in conduits independent of all other circuits or conductors. Emergency circuit installations shall be made in accordance with National Electrical Code Article 700.9.

3.04 EQUIPMENT FUSING

A. All equipment shall be furnished complete with fuses as described herein and/or as shown on the Drawings. Contractor shall furnish one set of spare fuses for each size fuse furnished on the project. Fuses shall be delivered to Owner prior to acceptance of project.

B. Fusing for protective equipment shall be of the type specifically designed for the intended application. Fuses for service entrance rated equipment shall be Class L. Fuses for branch circuit protection shall be Class RK5 unless specified otherwise. Provide protective fuses as specifically required by the equipment manufacturer.

3.05 INSTALLATION

A. The Electrical Contractor shall place a sign at the Main Switchboard indicating the type and location of the emergency generator in accordance with National Electrical Code Article 702.8(A) requirements.

B. Disconnecting means shall be provided for each motor and motor controller, and shall be located within sight from the controller and motor locations in accordance with National Electrical Code Article 430.102 requirements.

END OF SECTION

DIVISION 16 - ELECTRICAL
SECTION 16401 - OVERCURRENT PROTECTIVE DEVICE SHORT-CIRCUIT STUDY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes a computer-based, fault-current study to determine the minimum interrupting capacity of circuit protective devices.

1.3 DEFINITIONS

A. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

B. One-Line Diagram: A diagram which shows, by means of single lines and graphic symbols, the course of an electric circuit or system of circuits and the component devices or parts used therein.

C. Protective Device: A device that senses when an abnormal current flow exists and then removes the affected portion from the system.

D. SCCR: Short-circuit current rating.

E. Service: The conductors and equipment for delivering electric energy from the serving utility to the wiring system of the premises served.

1.4 ACTION SUBMITTALS

A. Product Data: For computer software program to be used for studies.

B. Other Action Submittals: Submit the following after the approval of system protective devices submittals. Submittals shall be in digital form.
   1. Short-circuit study input data, including completed computer program input data sheets.
   2. Short-circuit study and equipment evaluation report; signed, dated, and sealed by a qualified professional engineer.
      a. Submit study report for action prior to receiving final approval of the distribution equipment submittals. If formal completion of studies will cause delay in equipment manufacturing, obtain approval from Architect for preliminary submittal of sufficient study data to ensure that the selection of devices and associated characteristics is satisfactory.

b. Revised single-line diagram, reflecting field investigation results and results of short-circuit study.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Short-Circuit Study Specialist and Field Adjusting Agency.

B. Product Certificates: For short-circuit study software, certifying compliance with IEEE 399.

1.6 QUALITY ASSURANCE

A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are unacceptable.

B. Short-Circuit Study Software Developer Qualifications: An entity that owns and markets computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.
1. The computer program shall be developed under the charge of a licensed professional engineer who holds IEEE Computer Society's Certified Software Development Professional certification.

C. Short-Circuit Study Specialist Qualifications: Professional engineer in charge of performing the study and documenting recommendations, licensed in the state where Project is located. All elements of the study shall be performed under the direct supervision and control of this professional engineer.

D. Field Adjusting Agency Qualifications: An independent agency, with the experience and capability to adjust overcurrent devices and to conduct the testing indicated, that is a member company of the International Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

PART 2 PRODUCTS

2.1 COMPUTER SOFTWARE

A. Manufacturers: Subject to compliance with requirements, provide products by the following:
1. SKM Systems Analysis, Inc.
2. ETAP

B. Comply with IEEE 399 and IEEE 551.

C. Analytical features of fault-current-study computer software program shall have the capability to calculate "mandatory," "very desirable," and "desirable" features as listed in IEEE 399.

D. Computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output.

2.2 SHORT-CIRCUIT STUDY REPORT CONTENTS

A. Executive summary.

B. Study descriptions, purpose, basis, and scope. Include case descriptions, definition of terms, and guide for interpretation of the computer printout.

C. One-line diagram, showing the following:
   1. Protective device designations and ampere ratings.
   2. Cable size and lengths.
   3. Transformer kilovolt ampere (kVA) and voltage ratings.
   4. Motor and generator designations and kVA ratings.
   5. Switchgear, switchboard, motor-control center, and panelboard designations.

D. Comments and recommendations for system improvements, where needed.

E. Protective Device Evaluation:
   1. Evaluate equipment and protective devices and compare to short-circuit ratings.
   2. Tabulations of circuit breaker, fuse, and other protective device ratings versus calculated short-circuit duties.
   3. For 600-V overcurrent protective devices, ensure that interrupting ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.
   4. For devices and equipment rated for asymmetrical fault current, apply multiplication factors listed in the standards to 1/2-cycle symmetrical fault current.
   5. Verify adequacy of phase conductors at maximum three-phase bolted fault currents; verify adequacy of equipment grounding conductors and grounding electrode conductors at maximum ground-fault currents. Ensure that short-circuit withstand ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.

F. Short-Circuit Study Input Data: As described in "Power System Data" Article in the Evaluations.

G. Short-Circuit Study Output:
   1. Low-Voltage Fault Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
      a. Voltage.
      b. Calculated fault-current magnitude and angle.
      c. Fault-point X/R ratio.
      d. Equivalent impedance.
   2. Momentary Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
      a. Voltage.
      b. Calculated symmetrical fault-current magnitude and angle.
      c. Fault-point X/R ratio.
      d. Calculated asymmetrical fault currents:

1) Based on fault-point X/R ratio.
2) Based on calculated symmetrical value multiplied by 1.6.
3) Based on calculated symmetrical value multiplied by 2.7.

3. Interrupting Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
   a. Voltage.
   b. Calculated symmetrical fault-current magnitude and angle.
   c. Fault-point X/R ratio.
   d. No AC Decrement (NACD) ratio.
   e. Equivalent impedance.
   f. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a symmetrical basis.
   g. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a total basis.

PART 3 EXECUTION

3.1 EXAMINATION

A. Obtain all data necessary for the conduct of the study.
   1. Verify completeness of data supplied on the one-line diagram. Call any discrepancies to the attention of Engineer.
   2. For equipment provided that is Work of this Project, use characteristics submitted under the provisions of action submittals and information submittals for this Project.
   3. For relocated equipment and that which is existing to remain, obtain required electrical distribution system data by field investigation and surveys, conducted by qualified technicians and engineers. The qualifications of technicians and engineers shall be qualified as defined by NFPA 70E.
   4. Obtain all arc flash information from the local utility in a timely manner. No extension of the contract time shall be permitted due to coordination with the local utility.

B. Gather and tabulate the following input data to support the short-circuit study. Comply with recommendations in IEEE 551 as to the amount of detail that is required to be acquired in the field. Field data gathering shall be under the direct supervision and control of the engineer in charge of performing the study, and shall be by the engineer or its representative who holds NETA ETT Level III certification or NICET Electrical Power Testing Level III certification.
   1. Product Data for Project's overcurrent protective devices involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.
   2. Obtain electrical power utility impedance at the service.
   3. Power sources and ties.
   4. For transformers, include kVA, primary and secondary voltages, connection type, impedance, X/R ratio, taps measured in percent, and phase shift.
   5. For reactors, provide manufacturer and model designation, voltage rating, and impedance.

6. For circuit breakers and fuses, provide manufacturer and model designation. List type of breaker, type of trip, SCCR, current rating, and breaker settings.
7. Generator short-circuit current contribution data, including short-circuit reactance, rated kVA, rated voltage, and X/R ratio.
8. Busway manufacturer and model designation, current rating, impedance, lengths, and conductor material.
9. Motor horsepower and NEMA MG 1 code letter designation.
10. Cable sizes, lengths, number, conductor material and conduit material (magnetic or nonmagnetic).

3.2 SHORT-CIRCUIT STUDY

A. Perform study following the general study procedures contained in IEEE 399.

B. Calculate short-circuit currents according to IEEE 551.

C. Base study on the device characteristics supplied by device manufacturer.

D. The extent of the electrical power system to be studied is indicated on Drawings.

E. Begin short-circuit current analysis at the service, extending down to the system overcurrent protective devices as follows:
1. To normal system low-voltage load buses where fault current is 10 kA or less.
2. Exclude equipment rated 240-V ac or less when supplied by a single transformer rated less than 125 kVA.

F. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project. Study all cases of system-switching configurations and alternate operations that could result in maximum fault conditions.

G. The calculations shall include the ac fault-current decay from induction motors, synchronous motors, and asynchronous generators and shall apply to low- and medium-voltage, three-phase ac systems. The calculations shall also account for the fault-current dc decrement, to address the asymmetrical requirements of the interrupting equipment.
1. For grounded systems, provide a bolted line-to-ground fault-current study for areas as defined for the three-phase bolted fault short-circuit study.

H. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault at each of the following:
1. Electric utility's supply termination point.
2. Incoming switchgear.
3. Unit substation primary and secondary terminals.
4. Low-voltage switchgear.
5. Motor-control centers.
6. Control panels.
7. Standby generators and automatic transfer switches.
8. Branch circuit panelboards.
9. Disconnect switches.

3.3 ADJUSTING

A. Make minor modifications to equipment as required to accomplish compliance with short-circuit study.

3.4 DEMONSTRATION

A. Train Owner's operating and maintenance personnel in the use of study results.

END OF SECTION

DIVISION 16 - ELECTRICAL
SECTION 16402 - OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes computer-based, overcurrent protective device coordination studies to determine overcurrent protective devices and to determine overcurrent protective device settings for selective tripping.

1.3 DEFINITIONS

A. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

B. One-Line Diagram: A diagram which shows, by means of single lines and graphic symbols, the course of an electric circuit or system of circuits and the component devices or parts used therein.

C. Protective Device: A device that senses when an abnormal current flow exists and then removes the affected portion from the system.

D. SCCR: Short-circuit current rating.

E. Service: The conductors and equipment for delivering electric energy from the serving utility to the wiring system of the premises served.

1.4 ACTION SUBMITTALS

A. Product Data: For computer software program to be used for studies.

B. Other Action Submittals: Submit the following after the approval of system protective devices submittals. Submittals shall be in digital form.
   1. Coordination-study input data, including completed computer program input data sheets.
   2. Study and equipment evaluation reports.
   3. Overcurrent protective device coordination study report; signed, dated, and sealed by a qualified professional engineer.
      a. Submit study report for action prior to receiving final approval of the distribution equipment submittals. If formal completion of studies will cause delay in equipment manufacturing, obtain approval from Architect

for preliminary submittal of sufficient study data to ensure that the selection of devices and associated characteristics is satisfactory.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Coordination Study Specialist and Field Adjusting Agency.

B. Product Certificates: For overcurrent protective device coordination study software, certifying compliance with IEEE 399.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For the overcurrent protective devices to include in emergency, operation, and maintenance manuals.
   1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
      a. The following parts from the Protective Device Coordination Study Report:
         1) One-line diagram.
         2) Protective device coordination study.
         3) Time-current coordination curves.
      b. Power system data.

1.7 QUALITY ASSURANCE

A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are unacceptable.

B. Coordination Study Software Developer Qualifications: An entity that owns and markets computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.
   1. The computer program shall be developed under the charge of a licensed professional engineer who holds IEEE Computer Society's Certified Software Development Professional certification.

C. Coordination Study Specialist Qualifications: Professional engineer in charge of performing the study and documenting recommendations, licensed in the state where Project is located. All elements of the study shall be performed under the direct supervision and control of this professional engineer.

D. Field Adjusting Agency Qualifications: An independent agency, with the experience and capability to adjust overcurrent devices and to conduct the testing indicated, that is a member company of the International Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

PART 2 PRODUCTS

2.1 COMPUTER SOFTWARE DEVELOPERS

A. Software Developers:
   1 Manufacturers: Subject to compliance with requirements, provide products by the following:
      a. SKM Systems Analysis, Inc.
      b. ETAP

B. Comply with IEEE 242 and IEEE 399.

C. Analytical features of device coordination study computer software program shall have the capability to calculate "mandatory," "very desirable," and "desirable" features as listed in IEEE 399.

D. Computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output. Computer software program shall report device settings and ratings of all overcurrent protective devices and shall demonstrate selective coordination by computer-generated, time-current coordination plots.
   1. Optional Features:
      a. Arcing faults.
      b. Simultaneous faults.
      c. Explicit negative sequence.
      d. Mutual coupling in zero sequence.

2.2 PROTECTIVE DEVICE COORDINATION STUDY REPORT CONTENTS

A. Executive summary.

B. Study descriptions, purpose, basis and scope. Include case descriptions, definition of terms and guide for interpretation of the computer printout.

C. One-line diagram, showing the following:
   1. Protective device designations and ampere ratings.
   2. Cable size and lengths.
   3. Transformer kilovolt ampere (kVA) and voltage ratings.
   4. Motor and generator designations and kVA ratings.
   5. Switchgear, switchboard, motor-control center, and panelboard designations.

D. Study Input Data: As described in "Power System Data" Article.

E. Short-Circuit Study Output: As specified in "Short-Circuit Study Output" Paragraph in "Short-Circuit Study Report Contents" Article in Section 16401 "Overcurrent Protective Device Short-Circuit Study."

F. Protective Device Coordination Study:
   1. Report recommended settings of protective devices, ready to be applied in the field. Use manufacturer's data sheets for recording the recommended setting of overcurrent protective devices when available.
      a. Phase and Ground Relays:
         1) Device tag.

2) Relay current transformer ratio and tap, time dial, and instantaneous pickup value
3) Recommendations on improved relaying systems, if applicable.

e. Circuit Breakers:
1) Adjustable pickups and time delays (long time, short time, ground).
2) Adjustable time-current characteristic.
3) Adjustable instantaneous pickup.
4) Recommendations on improved trip systems, if applicable.

f. Fuses: Show current rating, voltage, and class.

G. Time-Current Coordination Curves: Determine settings of overcurrent protective devices to achieve selective coordination. Graphically illustrate that adequate time separation exists between devices installed in series, including power utility company's upstream devices. Prepare separate sets of curves for the switching schemes and for emergency periods where the power source is local generation. Show the following information:

1. Device tag and title, one-line diagram with legend identifying the portion of the system covered.
2. Terminate device characteristic curves at a point reflecting maximum symmetrical or asymmetrical fault current to which the device is exposed.
3. Identify the device associated with each curve by manufacturer type, function, and, if applicable, tap, time delay, and instantaneous settings recommended.
4. Plot the following listed characteristic curves, as applicable:
   a. Power utility's overcurrent protective device.
   b. Medium-voltage equipment overcurrent relays.
   c. Medium- and low-voltage fuses including manufacturer's minimum melt, total clearing, tolerance, and damage bands.
   d. Low-voltage equipment circuit-breaker trip devices, including manufacturer's tolerance bands.
   e. Transformer full-load current, magnetizing inrush current, and ANSI through-fault protection curves.
   f. Cables and conductors damage curves.
   g. Ground-fault protective devices.
   h. Motor-starting characteristics and motor damage points.
   i. Generator short-circuit decrement curve and generator damage point.
   j. The largest feeder circuit breaker in each motor-control center and panelboard.
5. Series rating on equipment allows the application of two series interrupting devices for a condition where the available fault current is greater than the interrupting rating of the downstream equipment. Both devices share in the interruption of the fault and selectivity is sacrificed at high fault levels. Maintain selectivity for tripping currents caused by overloads.
6. Provide adequate time margins between device characteristics such that selective operation is achieved.
7. Comments and recommendations for system improvements.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine Project overcurrent protective device submittals for compliance with electrical distribution system coordination requirements and other conditions affecting performance. Devices to be coordinated are indicated on Drawings.
   1. Proceed with coordination study only after relevant equipment submittals have been assembled. Overcurrent protective devices that have not been submitted and approved prior to coordination study may not be used in study.

3.2 PROTECTIVE DEVICE COORDINATION STUDY

A. Comply with IEEE 242 for calculating short-circuit currents and determining coordination time intervals.

B. Comply with IEEE 399 for general study procedures.

C. The study shall be based on the device characteristics supplied by device manufacturer.

D. The extent of the electrical power system to be studied is indicated on Drawings.

E. Begin analysis at the service, extending down to the system overcurrent protective devices as follows:
   1. To normal system low-voltage load buses where fault current is 10 kA or less.
   2. Exclude equipment rated 240-V ac or less when supplied by a single transformer rated less than 125 kVA.

F. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project. Study all cases of system-switching configurations and alternate operations that could result in maximum fault conditions.

G. Transformer Primary Overcurrent Protective Devices:
   1. Device shall not operate in response to the following:
      a. Inrush current when first energized.
      b. Self-cooled, full-load current or forced-air-cooled, full-load current, whichever is specified for that transformer.
      c. Permissible transformer overloads according to IEEE C57.96 if required by unusual loading or emergency conditions.
   2. Device settings shall protect transformers according to IEEE C57.12.00, for fault currents.

H. Motor Protection:
   1. Select protection for low-voltage motors according to IEEE 242 and NFPA 70.
   2. Select protection for motors served at voltages more than 600 V according to IEEE 620.

I. Conductor Protection: Protect cables against damage from fault currents according to ICEA P-32-382, ICEA P-45-482, and protection recommendations in IEEE 242. Demonstrate that equipment withstands the maximum short-circuit current for a time equivalent to the tripping time of the primary relay protection or total clearing time of the fuse. To determine temperatures that damage insulation, use curves from cable manufacturers or from listed standards indicating conductor size and short-circuit current.

J. Generator Protection: Select protection according to manufacturer's written recommendations and to IEEE 242.

K. The calculations shall include the ac fault-current decay from induction motors, synchronous motors, and asynchronous generators and shall apply to low- and medium-voltage, three-phase ac systems. The calculations shall also account for the fault-current dc decrement, to address the asymmetrical requirements of the interrupting equipment.
   1. For grounded systems, provide a bolted line-to-ground fault-current study for areas as defined for the three-phase bolted fault short-circuit study.

L. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault and single line-to-ground fault at each of the following:
   1. Electric utility's supply termination point.
   2. Switchgear.
   3. Unit substation primary and secondary terminals.
   4. Low-voltage switchgear.
   5. Motor-control centers.
   6. Standby generators and automatic transfer switches.
   7. Branch circuit panelboards.

M. Protective Device Evaluation:
   1. Evaluate equipment and protective devices and compare to short-circuit ratings.
   2. Adequacy of switchgear, motor-control centers, and panelboard bus bars to withstand short-circuit stresses.

3.3 LOAD-FLOW AND VOLTAGE-DROP STUDY

A. Perform a load-flow and voltage-drop study to determine the steady-state loading profile of the system. Analyze power system performance two times as follows:
   1. Determine load-flow and voltage drop based on full-load currents obtained in "Power System Data" Article.
   2. Determine load-flow and voltage drop based on 80 percent of the design capacity of the load buses.
   3. Prepare the load-flow and voltage-drop analysis and report to show power system components that are overloaded, or might become overloaded; show bus voltages that are less than as prescribed by NFPA 70.

3.4 MOTOR-STARTING STUDY

A. Perform a motor-starting study to analyze the transient effect of the system's voltage profile during motor starting. Calculate significant motor-starting voltage profiles and analyze the effects of the motor starting on the power system stability.

B. Prepare the motor-starting study report, noting light flicker for limits proposed by IEEE 141 and voltage sags so as not to affect the operation of other utilization equipment on the system supplying the motor.

3.5 POWER SYSTEM DATA

A. Obtain all data necessary for the conduct of the overcurrent protective device study.
   1. Verify completeness of data supplied in the one-line diagram on Drawings. Call discrepancies to the attention of Engineer.
   2. For new equipment, use characteristics submitted under the provisions of action submittals and information submittals for this Project.
   3. For existing equipment, whether or not relocated obtain required electrical distribution system data by field investigation and surveys, conducted by qualified technicians and engineers. The qualifications of technicians and engineers shall be qualified as defined by NFPA 70E.

B. Gather and tabulate the following input data to support coordination study. The list below is a guide. Comply with recommendations in IEEE 551 for the amount of detail required to be acquired in the field. Field data gathering shall be under the direct supervision and control of the engineer in charge of performing the study, and shall be by the engineer or its representative who holds NETA ETT Level III certification or NICET Electrical Power Testing Level III certification.
   1. Product Data for overcurrent protective devices specified in other Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.
   2. Electrical power utility impedance at the service.
   3. Power sources and ties.
   4. Short-circuit current at each system bus, three phase and line-to-ground.
   5. Full-load current of all loads.
   6. Voltage level at each bus.
   7. For transformers, include kVA, primary and secondary voltages, connection type, impedance, X/R ratio, taps measured in percent, and phase shift.
   8. For reactors, provide manufacturer and model designation, voltage rating, and impedance.
   9. For circuit breakers and fuses, provide manufacturer and model designation. List type of breaker, type of trip and available range of settings, SCCR, current rating, and breaker settings.
   10. Generator short-circuit current contribution data, including short-circuit reactance, rated kVA, rated voltage, and X/R ratio.
   11. For relays, provide manufacturer and model designation, current transformer ratios, potential transformer ratios, and relay settings.
   12. Maximum demands from service meters.
   13. Busway manufacturer and model designation, current rating, impedance, lengths, and conductor material.
   14. Motor horsepower and NEMA MG 1 code letter designation.
   15. Low-voltage cable sizes, lengths, number, conductor material, and conduit material (magnetic or nonmagnetic).
   16. Medium-voltage cable sizes, lengths, conductor material, and cable construction and metallic shield performance parameters.
   17. Data sheets to supplement electrical distribution system diagram, cross-referenced with tag numbers on diagram, showing the following:

a. Special load considerations, including starting inrush currents and frequent starting and stopping.
b. Transformer characteristics, including primary protective device, magnetic inrush current, and overload capability.
c. Motor full-load current, locked rotor current, service factor, starting time, type of start, and thermal-damage curve.
d. Generator thermal-damage curve.
e. Ratings, types, and settings of utility company's overcurrent protective devices.
f. Special overcurrent protective device settings or types stipulated by utility company.
g. Time-current-characteristic curves of devices indicated to be coordinated.
h. Manufacturer, frame size, interrupting rating in amperes rms symmetrical, ampere or current sensor rating, long-time adjustment range, short-time adjustment range, and instantaneous adjustment range for circuit breakers.
i. Manufacturer and type, ampere-tap adjustment range, time-delay adjustment range, instantaneous attachment adjustment range, and current transformer ratio for overcurrent relays.
j. Panelboards, switchboards, motor-control center ampacity, and SCCR in amperes rms symmetrical.
k. Identify series-rated interrupting devices for a condition where the available fault current is greater than the interrupting rating of the downstream equipment. Obtain device data details to allow verification that series application of these devices complies with NFPA 70 and UL 489 requirements.

3.6 FIELD ADJUSTING

A. Adjust relay and protective device settings according to the recommended settings provided by the coordination study. Field adjustments shall be completed by the engineering service division of the equipment manufacturer under the Startup and Acceptance Testing contract portion.

B. Make minor modifications to equipment as required to accomplish compliance with short-circuit and protective device coordination studies.

C. Testing and adjusting shall be by a full-time employee of the Field Adjusting Agency, who holds NETA ETT Level III certification or NICET Electrical Power Testing Level III certification.
1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters. Perform NETA tests and inspections for all adjustable overcurrent protective devices.

3.7 DEMONSTRATION

A. Engage the Coordination Study Specialist to train Owner's maintenance personnel in the following:

1. Acquaint personnel in the fundamentals of operating the power system in normal and emergency modes.
2. Hand-out and explain the objectives of the coordination study, study descriptions, purpose, basis, and scope. Include case descriptions, definition of terms, and guide for interpreting the time-current coordination curves.
3. Adjust, operate, and maintain overcurrent protective device settings.

END OF SECTION

DIVISION 16 - ELECTRICAL
SECTION 16403 - OVERCURRENT PROTECTIVE DEVICE
ARC-FLASH STUDY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes a computer-based, arc-flash study to determine the arc-flash hazard distance and the incident energy to which personnel could be exposed during work on or near electrical equipment.

1.3 DEFINITIONS

A. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

B. One-Line Diagram: A diagram which shows, by means of single lines and graphic symbols, the course of an electric circuit or system of circuits and the component devices or parts used therein.

C. Protective Device: A device that senses when an abnormal current flow exists and then removes the affected portion from the system.

D. SCCR: Short-circuit current rating.

E. Service: The conductors and equipment for delivering electric energy from the serving utility to the wiring system of the premises served.

1.4 ACTION SUBMITTALS

A. Product Data: For computer software program to be used for studies.

B. Other Action Submittals: Submit the following submittals after the approval of system protective devices submittals. Submittals shall be in digital form.
   1. Arc-flash study input data, including completed computer program input data sheets.
   2. Arc-flash study report; signed, dated, and sealed by a qualified professional engineer.
      a. Submit study report for action prior to receiving final approval of the distribution equipment submittals. If formal completion of studies will cause delay in equipment manufacturing, obtain approval from Architect

for preliminary submittal of sufficient study data to ensure that the selection of devices and associated characteristics is satisfactory.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Arc-Flash Study Specialist and Field Adjusting Agency.

B. Product Certificates: For arc-flash hazard analysis software, certifying compliance with IEEE 1584 and NFPA 70E.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance procedures according to requirements in NFPA 70E shall be provided in the equipment manuals.

B. Operation and Maintenance Procedures: In addition to items specified in Section 017823 "Operation and Maintenance Data," provide maintenance procedures for use by Owner's personnel that comply with requirements in NFPA 70E.

1.7 QUALITY ASSURANCE

A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are unacceptable.

B. Arc-Flash Study Software Developer Qualifications: An entity that owns and markets computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.
   1. The computer program shall be developed under the charge of a licensed professional engineer who holds IEEE Computer Society's Certified Software Development Professional certification.

C. Arc-Flash Study Specialist Qualifications: Professional engineer in charge of performing the study, analyzing the arc flash, and documenting recommendations, licensed in the state where Project is located. All elements of the study shall be performed under the direct supervision and control of this professional engineer.

D. Field Adjusting Agency Qualifications: An independent agency, with the experience and capability to adjust overcurrent devices and to conduct the testing indicated, that is a member company of the International Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

PART 2 PRODUCTS

2.1 COMPUTER SOFTWARE DEVELOPERS

A. Software Developers:
   1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. SKM Systems Analysis, Inc.
b. ETAP

B. Comply with IEEE 1584 and NFPA 70E.

C. Analytical features of device coordination study computer software program shall have the capability to calculate "mandatory," "very desirable," and "desirable" features as listed in IEEE 399.

2.2 ARC-FLASH STUDY REPORT CONTENT

A. Executive summary.

B. Study descriptions, purpose, basis and scope.

C. One-line diagram, showing the following:
1. Protective device designations and ampere ratings.
2. Cable size and lengths.
3. Transformer kilovolt ampere (kVA) and voltage ratings.
4. Motor and generator designations and kVA ratings.
5. Switchgear, switchboard, motor-control center and panelboard designations.

D. Study Input Data: As described in "Power System Data" Article.

E. Short-Circuit Study Output: As specified in "Short Circuit Study Output" Paragraph in "Short-Circuit Study Report Contents" Article in Section 16401 "Overcurrent Protective Device Short-Circuit Study."

F. Protective Device Coordination Study Report Contents: As specified in "Protective Device Coordination Study Report Contents" Article in Section 16402 "Overcurrent Protective Device Coordination Study."

G. Arc-Flash Study Output:
1. Interrupting Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
a. Voltage.
b. Calculated symmetrical fault-current magnitude and angle.
c. Fault-point X/R ratio.
d. No AC Decrement (NACD) ratio.
e. Equivalent impedance.
f. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a symmetrical basis.
g. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a total basis

H. Incident Energy and Flash Protection Boundary Calculations:
1. Arcing fault magnitude with and without required Arc Energy Reduction methods.
2. Protective device clearing time.
3. Duration of arc.
4. Arc-flash boundary.

5. Working distance.
6. Incident energy.
7. Hazard risk category.
8. Recommendations for arc-flash energy reduction.

I. Fault study input data, case descriptions, and fault-current calculations including a definition of terms and guide for interpretation of the computer printout.

2.3 ARC-FLASH WARNING LABELS

A. Comply with requirements in Section 260553 "Identification for Electrical Systems." Produce a 3.5-by-5-inch thermal transfer label of high-adhesion polyester for each work location included in the analysis.

B. The label shall have an orange header with the wording, "WARNING, ARC-FLASH HAZARD," and shall include the following information taken directly from the arc-flash hazard analysis:
1. Location designation.
2. Nominal voltage.
3. Flash protection boundary.
4. Hazard risk category.
5. Incident energy.
6. Working distance.
7. Engineering report number, revision number, and issue date.

C. Labels shall be machine printed, with no field-applied markings.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine Project overcurrent protective device submittals. Proceed with arc-flash study only after relevant equipment submittals have been assembled. Overcurrent protective devices that have not been submitted and approved prior to arc-flash study may not be used in study.

3.2 ARC-FLASH HAZARD ANALYSIS

A. Comply with NFPA 70E and its Annex D for hazard analysis study.

B. Preparatory Studies:
1. Protective Device Coordination Study Report Contents: As specified in "Protective Device Coordination Study Report Contents" Article in Section 16402 "Overcurrent Protective Device Coordination Study."

C. Calculate maximum and minimum contributions of fault-current size.
1. The minimum calculation shall assume that the utility contribution is at a minimum and shall assume no motor load.

2. The maximum calculation shall assume a maximum contribution from the utility and shall assume motors to be operating under full-load conditions.

D. Calculate the arc-flash protection boundary and incident energy at locations in the electrical distribution system where personnel could perform work on energized parts.

E. Include medium- and low-voltage equipment locations, except equipment rated 240-V ac or less fed from transformers less than 125 kVA.

F. Safe working distances shall be specified for calculated fault locations based on the calculated arc-flash boundary, considering incident energy of 1.2 cal/sq.cm.

G. Incident energy calculations shall consider the accumulation of energy over time when performing arc-flash calculations on buses with multiple sources. Iterative calculations shall take into account the changing current contributions, as the sources are interrupted or decremented with time. Fault contribution from motors and generators shall be decremented as follows:
1. Fault contribution from induction motors should not be considered beyond three to five cycles.
2. Fault contribution from synchronous motors and generators should be decayed to match the actual decrement of each as closely as possible (e.g., contributions from permanent magnet generators will typically decay from 10 per unit to three per unit after 10 cycles).

H. Arc-flash computation shall include both line and load side of a circuit breaker as follows:
1. When the circuit breaker is in a separate enclosure.
2. When the line terminals of the circuit breaker are separate from the work location.

I. Base arc-flash calculations on actual overcurrent protective device clearing time. Cap maximum clearing time at two seconds based on IEEE 1584, Section B.1.2.

3.3 POWER SYSTEM DATA

A. Obtain all data necessary for the conduct of the arc-flash hazard analysis.
1. Verify completeness of data supplied on the one-line diagram on Drawings and under "Preparatory Studies" Paragraph in "Arc-Flash Hazard Analysis" Article. Call discrepancies to the attention of Engineer.
2. For new equipment, use characteristics submitted under the provisions of action submittals and information submittals for this Project.
3. For existing equipment, whether or not relocated, obtain required electrical distribution system data by field investigation and surveys, conducted by qualified technicians and engineers.

B. Electrical Survey Data: Gather and tabulate the following input data to support study. Comply with recommendations in IEEE 1584 and NFPA 70E as to the amount of detail that is required to be acquired in the field. Field data gathering shall be under the direct supervision and control of the engineer in charge of performing the study, and shall be by the engineer or its representative who holds NETA ETT Level III certification or NICET Electrical Power Testing Level III certification.

1. Product Data for overcurrent protective devices specified in other Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.
2. Obtain electrical power utility impedance at the service.
3. Power sources and ties.
4. Short-circuit current at each system bus, three phase and line-to-ground.
5. Full-load current of all loads.
6. Voltage level at each bus.
7. For transformers, include kVA, primary and secondary voltages, connection type, impedance, X/R ratio, taps measured in per cent, and phase shift.
8. For reactors, provide manufacturer and model designation, voltage rating and impedance.
9. For circuit breakers and fuses, provide manufacturer and model designation. List type of breaker, type of trip and available range of settings, SCCR, current rating, and breaker settings.
10. Generator short-circuit current contribution data, including short-circuit reactance, rated kVA, rated voltage, and X/R ratio.
11. For relays, provide manufacturer and model designation, current transformer ratios, potential transformer ratios, and relay settings.
12. Busway manufacturer and model designation, current rating, impedance, lengths, and conductor material.
13. Motor horsepower and NEMA MG 1 code letter designation.
14. Low-voltage cable sizes, lengths, number, conductor material and conduit material (magnetic or nonmagnetic).
15. Medium-voltage cable sizes, lengths, conductor material, and cable construction and metallic shield performance parameters.

3.4 LABELING

A. Apply one arc-flash label for 600-V ac, 480-V ac, and applicable 208-V ac panelboards and disconnects and for each of the following locations:
   1. Motor-control center.
   2. Low-voltage switchboard.
   3. Switchgear.
   4. Medium-voltage switch.
   5. Control panel.

3.5 APPLICATION OF WARNING LABELS

A. Install the arc-fault warning labels under the direct supervision and control of the Arc-Flash Study Specialist.

3.6 DEMONSTRATION

A. Engage the Arc-Flash Study Specialist to train Owner's maintenance personnel in the potential arc-flash hazards associated with working on energized equipment and the significance of the arc-flash warning labels.

END OF SECTION

DIVISION 16 - ELECTRICAL
SECTION 16410 - SURGE PROTECTION DEVICES FOR LOW-VOLTAGE ELECTRICAL POWER CIRCUITS

PART 1.00 GENERAL

1.01 SCOPE

A. This section describes the materials and installation requirements for surge protective devices (SPD) for the protection of all AC electrical circuits.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section. Other sections that may relate to the work in this section include, but are not limited to, the following:
   1. Section 16050 – Basic Electrical Materials and Methods

1.03 SUBMITTALS

A. Submit shop drawings and product information for approval and final documentation in the quantities listed according to the Conditions of the Contract. Customer name, customer location, and customer order number shall identify all transmittals.

B. Submittals shall include UL 1449 3rd Edition Listing documentation verifiable by visiting www.UL.com, clicking “Certifications” link, searching using UL Category Code: VZCA.
   1. Short Circuit Current Rating (SCCR)
   2. Voltage Protection Ratings (VPRs) for all modes
   3. Maximum Continuous Operating Voltage rating (MCOV)
   4. I-nominal rating (I-n)
   5. SPD shall be Type 1 UL listed and labeled

B. Upon request, an unencapsulated but complete SPD formally known as TVSS shall be presented for visual inspection.

D. Minimum of ten (10) year warranty

1.04 RELATED STANDARDS

A. The following codes and standards shall be referenced:
   1. IEEE C62.41.1, IEEE Guide on the Surge Environment in Low-Voltage (1000 V and Less) AC Power Circuits,
   2. IEEE C62.41.2, IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and Less) AC Power Circuits,
   3. IEEE C62.45, IEEE Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage (1000 V and Less) AC Power Circuits.
   4. National Electrical Code: Article 285
   5. UL 1283 - Electromagnetic Interference Filters
   6. UL 1449, Third Edition, effective September 29, 2009 – Surge Protective Devices

1.05 LISTING REQUIREMENTS

A. SPD shall bear the UL Mark and shall be Listed to most recent editions of UL 1449 and UL 1283. “Manufactured in accordance with” is not equivalent to UL listing and does not meet the intent of this specification.

B. SPD and performance parameters shall be posted at www.UL.com under Category Code: VZCA. Products or parameters without posting at UL.com shall not be approved.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Engage a firm with at least ten (10) years’ experience in manufacturing transient voltage surge suppressors.

B. Manufacturer shall be ISO 9001 or 9002 certified.

C. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five (10) years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

D. The SPD shall be compliant with the Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC.

1.07 DELIVERY, STORAGE AND HANDLING

A. Handle and store equipment in accordance with manufacturer’s Installation and Maintenance Manuals. One (1) copy of this document to be provided with the equipment at time of shipment.

PART 2.00 PRODUCTS

2.01 MANUFACTURERS

A. Provide internally mounted transient voltage suppressors as described herein.

B. Manufacturer and/or manufacturer's model number listed in this Specification are used to establish general style, type, character, and quality of product desired. Similar items manufactured by manufacturers other than those listed will be considered, providing submittals are made according to Pre-Bid Approval requirements of Instructions to Bidders.

C. Where no manufacturer or model number are given, any product meeting performance or design criteria, or referenced trade association standard may be used and Pre-Bid Approval is not required.

D. Subject to compliance with the specified requirements, provide products by one of the following manufacturers:
Siemens

2.02 SURGE PROTECTIVE DEVICE FEATURES

A. SPD shall be UL 1449 labeled with 200kA Short Circuit Current Rating (SCCR). Fuse ratings shall not be considered in lieu of demonstrated withstand testing of SPD, per NEC 285.6.

B. SPD shall be UL 1449 labeled as Type 1 intended for use without need for external or supplemental overcurrent controls. Internal overcurrent and thermal overtemperature controls shall protect every suppression component of every mode, including N-G. SPDs relying upon external or supplementary installed safety disconnectors do not meet the intent of this specification.

C. SPD shall be UL 1449 labeled with 20kA I-nominal (I-n) (verifiable at UL.com) for compliance to UL 96A Lightning Protection Master Label and NFPA 780.

D. Suppression components shall be heavy duty 'large block' MOVs, each exceeding 30mm diameter.

E. Standard 7 Mode Protection paths: SPD shall provide surge current paths for all modes of protection: L-N, L-G, L-L, and N-G for Wye systems; L-L, L-G in Delta and impedance grounded Wye systems.

F. If a dedicated breaker for the SPD is not provided in the switchboard, the service entrance SPD shall include an integral UL Recognized disconnect switch. A dedicated breaker shall serve as a means of disconnect for distribution SPD's.

G. SPD shall meet or exceed the following criteria:

1. Minimum surge current capability (single pulse rated) per phase shall be:
   a. Service Entrance applications:
      Siemens Model TPS3 12 with Maximum 7-Mode surge current capability shall be 300kAper phase.
      Advanced Protection Technologies Model TE_XAS30 series with Maximum 7-Mode surge current capability of 300kA per phase.
   b. Distribution applications:
      Siemens Model TPS3 12 with Maximum surge current capability of 200kA per phase.
      Advanced Protection Technologies Model TE_XAS20 series with Maximum surge current capability of 200kA per phase
   c. Branch Panel applications:
      Siemens Model TPS3 12 with Maximum surge current capability of 100kA per phase.
      2) Advanced Protection Technologies Model TE_XDS104 series with Maximum surge current capability of 100kA per phase
2. UL 1449 Listed Voltage Protection Ratings (VPRs) shall not exceed the following:

VOLTAGE	L-N	L-G	N-G
208Y/120V	700V	700V	700V

480Y/277V	1500V	1500V	1500V

H. UL 1449 Listed Maximum Continuous Operating Voltage (MCOV) (verifiable at UL.com):

System Voltage	Allowable System Voltage Fluctuation (%)	MCOV
208Y/120	25%	150V
480Y/277V	20%	320V

I. SPD shall include a serviceable, replaceable module (excluding Distribution).

J. Service Entrance SPD shall have UL 1283 EMI/RFI filtering with minimum attenuation of -50dB at 100kHz.

K. SPD shall have a warranty for a period of ten (10) years, incorporating unlimited replacements of suppressor parts if they are destroyed by transients during the warranty period.

L. Service Entrance SPDs shall be equipped with the following diagnostics:
1. Visual LED diagnostics including a minimum of one green LED indicator per phase, and one red service LED.
2. Audible alarm with on/off silence function and diagnostic test function (excluding branch).
3. Form C dry contacts
4. Surge Counter
5. No other test equipment shall be required for SPD monitoring or testing before or after installation.

M. Distribution Panels and Branch Panels SPDs shall be equipped with the following diagnostics:
1. Visual LED diagnostics including a minimum of one green LED indicator per phase, and one red service LED.
2. No other test equipment shall be required for SPD monitoring or testing before or after installation.
3. Surge protection devices installed for individual equipment items shall meet or exceed the following criteria:
   a. Minimum surge current capability (single pulse rated) per phase shall be:
      Siemens Model TPS3_0305 series with dry contacts and audible alarm and surge current capability shall be 50kA per phase.
      Advanced Protection Technologies Model S50A series with dry contact and surge current capability shall be 50kA per phase.

UL 1449 Listed Voltage Protection Ratings (VPRs) shall not exceed the following:

VOLTAGE	L-N	L-G	N-G
208Y/120V	600V	1000V	1000V
480Y/277V	1200V	2000V	1000V

UL 1449 Listed Maximum Continuous Operating Voltage (MCOV) (verifiable at UL.com):

System Voltage	Allowable System Voltage Fluctuation (%)	MCOV

208Y/120	25%	150V
480Y/277V	20%	320V

4. Furnished with NEMA 4X Polycarbonate enclosure.

PART 3.00 EXECUTION

3.01 INSTALLATION

A. The installation shall meet the following criteria:
1. Install per manufacturer's recommendations and contract documents.
2. Install units plumb, level and rigid without distortion
3. One primary suppressor shall be installed external to the service entrance in accordance with manufacturer instructions.
4. Service Entrance SPD shall be installed on the line or load side of the main service disconnect.
5. Service Entrance SPD ground shall be bonded to the service entrance ground.
6. At Service Entrance or Transfer Switch, a UL approved disconnect switch shall be provided as a means of servicing disconnect if a 60A breaker is not available.
7. One SPD shall be installed external to each designated distribution panelboard.
8. At Distribution, MCC and Branch, TVSS shall have an independent means of servicing disconnect such that the protected panel remains energized. A 30A breaker (or larger) may serve this function.
9. SPD shall be installed per manufacturer's installation instructions with lead lengths as short (less than 24") and straight as possible. Gently twist conductors together.
10. Installer may reasonably rearrange breaker locations to ensure short & straightest possible leads to SPDs.
11. Before energizing, installer shall verify service and separately derived system Neutral to Ground bonding jumpers per NEC.

3.02 ADJUSTMENTS AND CLEANING

A. Remove debris from SPD and wipe dust and dirt from all components.

B. Repaint marred and scratched surfaces with touch up paint to match original finish.

3.03 TESTING

A. Check tightness of all accessible mechanical and electrical connections to assure they are torqued to the minimum acceptable manufacture's recommendations.

B. Check all installed panels for proper grounding, fastening and alignment.

3.04 WARRANTY

A. Equipment manufacturer warrants that all goods supplied are free of non-conformities in workmanship and materials for one year from date of initial operation, but not more than eighteen months from date of shipment.

END OF SECTION

DIVISION 16 - ELECTRICAL
SECTION 16500 - LIGHTING

PART 1.00 GENERAL

1.01 LIGHTING SCHEDULE

A. The Contractor shall install lighting fixtures and accessories as shown on the drawings and/or described herein. The Contractor shall also install lamps for all fixtures.

PART 2.00 PRODUCTS

2.01 LED LIGHTING

A. Lighting fixtures with LED light sources shall meet the following fixture and light source requirements:
   1. LED Color Temperature – Neutral White (NW), 4000K nom., CRI > 80
   2. Line Voltage – Universal Voltage 120-277 volts
   3. Governmental Standards – LM79 and LM80 Compliant
   4. Expected Lamp Life – LED Life Rating (L_{70} B_{10}) to be 60,000 hours to 100,000 hours; Defined as time of operation (in hours) to 30% lumen depreciation (i.e. 70% lumen maintenance), derived from Luminaire in-situ temperature measurement testing (i.e. LED chip package temperature (T_S) measurement obtained with the LED chip package operating in given luminaire and in a given stabilized ambient environment) under UL1598 environments and directly correlated to LED package manufacturers IESNA LM-80-08 data. Predicted (L_{70} B_{10}) Limits (@ 25°C luminaire ambient operating environment): Greater than 60,000 hours @ 350mA Drive Current
   5. Driver – Components must be fully encased in potting material for moisture resistance, and must comply with IEC and FCC standards
   6. Surge Protection – Surge protection must be provided including separate sure protection built into electronic driver
   7. Mechanical – Luminaire LED system components to be low copper aluminum, with high performance heat sink(s) designed specifically for LED luminaires. No active cooling features (Fans, etc.). Luminaire configuration must allow for modular upgradability and/or field repair of all electrical components (i.e. LED modules, Driver(s), etc.). Drivers and vertical light bars must be all mounted to a twist-lock tool-less assembly for ease of installation and trouble- shooting.

2.02 FIXTURES

A. Fixtures as described in the Fixture Schedule on the drawings shall be furnished by the Contractor and shall be properly installed.

PART 3.00 EXECUTION

3.01 INSTALLATION

A. Unless otherwise specified, lighting fixtures shall be permanently installed and connected to the wiring system.

B. The Contractor shall support each fixture, independently from the building structure. Ceiling framing members shall not be used to support fixtures except in specified areas where ceiling supports for this purpose have been specified elsewhere in these specifications. Each fixture shall have at least two fixture supports. Supports shall be on opposite corners of the fixture, if applicable.

C. Flexible conduit used for fixture whips shall be at least twelve (12) inches, but not more than 48 inches long.

3.02 CEILING COMPATIBILITY

A. Catalog numbers shown on the drawings or descriptions of lighting fixtures contained herein may indicate fixture compatibility with certain types of ceiling construction. Contractor shall determine exact type of ceiling actually to be furnished in each area and shall obtain fixtures to suit, deviation from specified catalogue numbers or descriptions only where necessary and only to the extent necessary to insure fixture/ceiling compatibility.

3.03 LIGHT LEAKS

A. The Contractor shall, at the end of this project, adjust all recessed lighting fixtures so that there will be no light leaks between the fixture trim and the ceiling. Contractor shall also adjust recessed fluorescent fixtures to eliminate any light leaks between fixture trim and ceiling grid member.

3.04 LAMPS

A. The Contractor shall install lamps in all fixtures and shall obtain replacement lamps should any not properly operate or become damaged during construction.

3.05 EXIT FIXTURES

A. Exit fixtures shall be installed according to Life Safety Code requirements, with face(s) plainly visible and directional arrows indicating the proper direction of egress.

END OF SECTION

DIVISION 16 - ELECTRICAL
SECTION 16900 - PROCESS INSTRUMENTATION AND CONTROL

PART 1.00 GENERAL

1.01 WORK INCLUDED

The work covered under this section of the specifications includes the furnishing and installing of all instrumentation and control hereinafter specified to perform the intended function for the Faubourg stie.

1.02 RELATED WORK

A. Section 16050 – Basic Electrical Material and Methods
B. Division 11 Specifications

PART 2.00 PRODUCTS

2.01 SYSTEM SUPPLIER

A. All instrumentation and control systems equipment shall be furnished by a System Supplier. The System Supplier shall provide and be responsible for the proper operation of all Process Instrumentation and Controls and Control Panels. The System Supplier shall perform in house submittal drawings and assembly of products. Subcontracting submittal drawings and equipment assembly will not be permitted.

B. Substitutions of functions or equipment specified will not be acceptable.

C. The entire system shall be warranted for one year from date of substantial completion.

D. The Contractor shall assign full responsibility for the function operation of all new instrumentation and control systems to a System Supplier. This System Supplier shall be responsible for all coordination necessary in order to select, to furnish, to supervise installation and connections, to calibrate, and to place into operation all instrumentation and controls along with all other equipment and accessories as specified herein. The System Supplier shall be a licensed electrical contractor in the state of Louisiana.

E. The System Supplier shall be one of established favorable reputation who has designed and produced similar systems and components for a period of at least (10) ten years.

F. It shall be required of the System Supplier to execute and submit a guarantee to assume full responsibility as defined in Section 2.01, paragraph ‘A’ above. It is the duty of the Contractor to include this guarantee with his Bidding Documents.

G. Only the guarantee of the System Supplier whose name the Contractor has inserted in his Bidding Documents is required. Failure by a System Supplier to provide a written guarantee with his proposal shall be deemed by the Contractor as “NO BID” and that System Supplier will not be acceptable. The written guarantee shall be on the named System Supplier's letterhead and shall be signed by a responsible representative who will

be primarily involved in the fulfillment of this guarantee. The written guarantee shall be stated as follows:

"... (Name of Single Source System Supplier)...guarantees that the proposal offered provides for complete compliance with all requirements of this section of the project specifications without exceptions to these specifications.

Full responsibility will be placed upon... (Name of Single Source System Supplier)...for all coordination necessary to select, to furnish, to supervise installation and connections, to calibrate, and to place into operation Process Instrumentation and Controls, Control Panels, and all other equipment and accessories needed to provide a complete operating system to comply with requirements of this section of the project specifications.

... (Name of Single Source System Supplier)... guarantees to provide all submittal drawings, instruction manuals, and qualified personnel for specified field services and training, all as defined within this section of the project specifications."

... (Name of Single Source System Supplier)... is a licensed electrical contractor in the state of Louisiana; Certificate of Responsibility No._ _____, name of qualifying party ;

Guarantee on system function and equipment shall be one (1) year from date of substantial completion or partial acceptance.

2.02 SUBMITTAL DRAWINGS

A. Descriptive literature and drawings for equipment and systems being furnished under this section shall be included in two submittals as a maximum. If two submittals are made, the first shall include all primary devices, transmitters, sensors, and field mounted equipment. The second submittal will include the balance of the submittal required. The submittal shall include as a minimum, equipment specifications, dimensional drawings, flow and other calculations, schematic drawings of each and every system within the complete offering, and such other information requested by the Engineer or considered necessary to the proper installation of the equipment. Furnish submittals in a Bound Booklet Form 8.5" X 11". No sheets shall be larger than 8.5" X 11". Foldout larger sheets will not be acceptable. This submittal shall include coordinated information and drawings for all items that the Single Source System Supplier is required to furnish under this section of the specifications, all in one integrated and coordinated manual. Each item of a submittal shall carry the appropriate title and be indexed against the appropriate specification item.

B. A quantity of eight (8) sets of submittals shall be furnished for the Engineer's approval.

2.03 INSTRUCTION MANUALS

Prior to 65% of the value of job completion, System Supplier shall furnish two (2) copies to the Engineer and one (1) copy to the Owner of all descriptive matter and complete system operation instruction manuals in separate indexed binders coordinated with the equipment that is furnished and installed for approval. System Supplier shall incorporate Engineer's comments and resubmit for approval within thirty (30) days of receipt of Engineer's comments. Once final approval is

obtained, System Supplier shall furnish two (2) copies to the Owner and two (2) to the Engineer.

2.04 RELATED SYSTEM COMPONENTS

The attention of the System Supplier is called to sections concerned with electrical work, chemical feeders, valves, piping, etc., and such other devices not specified under this section, but related to it.

PART 3 CONTROL PANEL SPECIFICATIONS

3.01 GENERAL

A. Enclosure shall be constructed of 12-gauge stainless steel. Seams shall be continuously welded and ground smooth without holes or knockouts. Provide a seamless foam-in-place oil-resistant gasket to assure water tight and dust tight seal. Provide a rolled lip around three sides of door and all sides of enclosure opening to exclude liquids and contaminants. Provide an internal 3-point latch and padlocking powerglide handle to assure security and a water-tight seal while still allowing convenient access. Door shall be removable by pulling a stainless steel continuous hinge pin. Double-door enclosures shall come complete with twelve-inch (12") stainless steel floor stands welded to the enclosure. Enclosure shall be factory painted with white polyester powder paint inside and out over pretreated surfaces. The enclosure shall be rated NEMA Type 4X and be manufactured by Hoffman, Saginaw Control & Engineering (SCE) or approved equal. Enclosure backplate shall be a minimum of 12-gauge steel, finished with white polyester powder paint or a conductive, corrosion-resistant coating.

B. All power and control wires shall be stranded copper type MTW. All wiring shall be in covered plastic wireway.

C. All points necessary for external connection in the controller, whether power or control, shall be wired to a terminal strip located at the top or bottom of the enclosure as directed by the engineer. The terminal strip shall be permanently marked with the same designation as the wire connected to it.

D. All power and control wires shall be marked at both ends using self-adhering wire markers. No two wires having different functions within the control panel shall have the same markings.

E. All circuit breakers, starters, and other control devices mounted within the controller panel shall be labeled for identification both within the panel and on the wiring schematic with corresponding designations.

F. Control power shall be 120 volts and shall be protected by a correctly sized circuit breaker. If required, provide a properly sized control power transformer with primary over current protection.

G. Each starter shall be provided with overload protection in all three phases and each individual starter shall have phase failure protection.

H. All selector switches, pilot lights and control devices shall be visible and operable from the

Controller exterior door or an interior deadfront panel when required. The deadfront panel shall be constructed of anodized aluminum and shall have a continuous aluminum hinge. An anodized aluminum deadfront shall be utilized when the Controller environment is not conducive to exposed controls or as specified on drawings.

I. All approval drawings shall be prepared per J.I.C. standards for engineers review prior to any fabrication of control equipment. The Controller shall be produced by a UL 508 listed shop. Proof of label availability shall be submitted with above drawing.

J. The controller manufacturer shall provide a written warranty with approval drawings covering all Control materials and parts furnished for a period ending one year after final acceptance of the project. This warranty shall cover all material replacement, all labor, and all travel expenses.

K. The controller manufacturer shall show satisfactory evidence that he maintains a fully equipped factory organization capable of furnishing adequate service for the equipment furnished, including replacement parts within a 200-mile radius of the job site. Suppliers employing outside organizations for "ON CALL" service shall not be considered.

L. The controller manufacturer shall have a service department capable to respond in emergency condition twenty-four/seven and three-hundred sixty-five days a year (24/7/365).

M. The quality establishing brand for the control panel(s) shall be that as manufactured by Control Systems, Inc. of Jackson, MS.

3.02 TRIPLEX LIFT STATION CONTROL PANEL

A. SERVICE ENTRANCE: The control panel shall be designed for 120/240-volt, three-phase, four-wire power. The control panel shall be rated NEMA 4X, as indicated on drawing.

B. MAIN BREAKER: Provide a properly sized Main Breaker, as shown on the drawings. In addition, provide a through the door operator mounted on the interior deadfront. The operator shall prevent the deadfront from being opened while the breaker is in the "ON" position.

C. POWER DISTRIBUTION BLOCKS: Provide properly sized Power Distribution Block(s) (PDB), as required for the control panel. Power distribution blocks shall be UL Listed and rated for the voltage and ampere rating as required; manufactured by Marathon, Square D, or approved equal. Provide necessary lugs for service entrance neutral.

D. MISCELLANEOUS FEEDER BREAKERS: Provide a 60-amp, 240-volt, 3-pole feeder breaker to feed the external Main Surge Protection Device.

E. POWER MONITOR: Provide a service entrance rated Power Monitor (PM), per Component Specifications. Power monitor shall constantly monitor the three-phase voltages to detect harmful power line conditions, caused by single-phasing, low voltage, phase reversal, and voltage unbalance. When a harmful condition is detected, no three-phase motors shall be allowed to operate. Phase monitor shall be protected by 1 amp,

240-volt fuses on the primary side.

F. PUMPS NO.1, NO.2 AND NO.3: Provide a combination circuit breaker and externally mounted Variable Frequency Drive starter (VFD), per Component Specifications, for each pump. The Variable Frequency Drive shall come complete with an externally mounted 5% Line and Load Reactor (LR), "**if required**," per Component Specifications, to attenuate harmonics and provide protection from transients. Acceptable VFD manufactures shall be Allen-Bradley Power Flex 753, Danfoss VLT Aqua, Invertek Optidrive or approved equal. The Full Load Amperes (FLA) of the variable frequency drive **must be** greater than the Full Load Amperes of the motor horsepower being furnished. The **Contractor** must use properly sized cable with ground from the starter to the motor. Motor cable ground conductor shall land on a terminal on the VFD, per VFD manufacturer's requirements. The VFD keypad shall be accessible through or installed on the deadfront door of the control panel. In addition, provide the following additional equipment and controls:

1. The pumps shall be controlled by a Quadraplex Pump Controller (QC1-3), per Component Specifications. The controller shall be capable of operating with float switches or a level controller with dry contact outputs for All-Stop, Lead Start, Lag 1 Start and Lag 2 Start during normal operation. In the automatic mode, the Quadraplex Pump Controller shall receive stop and start commands from the Level Meter/Controller, submersible transducer and back-up float switches, all as described below. All pumps shall be exercised uniformly. The frequency drive controller (FDC1-3) shall balance pump speeds based on the number of pumps running and level of liquid in wet pit. The Quadraplex Pump Controller shall provide variable delays for Power-On, Motor Failure, Motor Start, and Short Cycle. Field adjustable motor failure delays shall be provided in the range of five (5) seconds to five (5) minutes. Adjustable power-on delay shall also be included for the pump during initial startup or after a power failure. The Quadraplex Pump Controller shall be a standard, catalogued product of a water and wastewater automation equipment manufacturer regularly engaged in the design and manufacture of such equipment for a period of at least fifteen (15) years. In addition, perform all control functions as specified in Component Specifications Section. The Quadraplex Controller shall have the following operators and indicators:

    a. Manual-Off-Automatic selector switch
    b. Green "Running" LED
    c. Red "Failure" LED
    d. Green pump "Start" pilot lights for Lead Lag.
    e. Amber pump "Stop" pilot lights for Lead Lag.

2. Provide a Quadraplex Alarm Telemetry system (QCAT), per Component Specifications, for the Quadraplex Controller, which provides auxiliary normally open relay contact outputs for the following quadraplex controller alarms: auxiliary alarm, improper sequence, Motor No.1 Failure, Motor No.2 Failure, Motor No.3 Failure, Motor No.4, Failure Motor No.1 Seal Failure, Motor No.2 Seal Failure, Motor No.3 Seal Failure, Motor No.4 Seal Failure, Improper Sequence, One (1) Auxiliary Contact, and High Level or Flow. Alarm telemetry system shall be capable of integrating with a customer furnished future alarm dialer, SCADA

system, FUTURE telemetry equipment, etc.

3. Provide a Motor Monitors (MM-1, MM-2 and MM-3) complete with properly sized Current Transformer, both per Component Specifications. The Motor Monitor shall provide a positive run signal, monitor motor running current, and indicate motor running time and motor full load running amperes. In addition, the motor monitor shall come complete with high and low amperes set points for the pump.

G. VARIABLE FREQUENCY DRIVE CONTROLLER: Provide a Frequency Drive Controller (FDC1-3), per Component Specifications. The frequency drive controller shall balance pump speeds based on the level of liquid in the wetwell. The operator shall be able to select a signal level at which point the VFD(s) will operate at minimum speed and a signal level at which point the VFD(s) will operate at maximum speed when the controller is receiving a positive motor running signal for at least one motor. As the input signal increases from the minimum setting to the maximum setting, the VFD(s) shall increase in speed linearly. The operator shall be able to select individual minimum and maximum speed settings with one or more motors operating. All control setpoints shall be field adjustable throughout the complete signal range from the front of the controller. Setpoints shall be displayed on a digital readout at any time via pushbutton.

H. LEVEL METER/CONTROLLER: Provide a Level Meter/Controller, (LMC-WW), per Component Specifications. All control setpoints shall be field adjustable throughout the complete signal range from the front of the meter/controller. Setpoints shall be displayed on a digital readout at any time via pushbutton. The setpoints shall be field adjustable to operate on rising above or falling below the desired setpoint. The Level Meter/Controller shall be a standard, catalogued product of a water and wastewater automation equipment manufacturer regularly engaged in the design and manufacture of such equipment for a period of at least fifteen (15) years. The Level Meter/Controller shall receive an analog signal from the wet pit submersible pressure level transmitter. Back-up float switches shall be utilized in the event of a submersible pressure level transmitter failure and activate the common alarm light. The Level Meter/Controller shall provide OFF-ON set point controls for the Quadraplex Controller (QC1-3). Provide the following set points for this controller.

1. High Level Alarm (Rising Level)
2. Lag 2 Pump Start (Rising Level)
3. Lag 1 Pump Start (Rising Level)
4. Lead Pump Start (Rising Level)
5. Pump(s) Stop (Falling Level)
6. Low Level Alarm (Falling Level)
7. Provide one (6) spare setpoints for future use.

In addition, provide a signal failure relay option with two relays, to energize when the transducer signal goes above 20mA or falls below 4mA. The relays can energize on both high/low conditions or one can energize on high failure (signal above 20mA) and the other on low failure (signal loss). This failure alarm shall also energize a front panel flashing LED alarm indicator.

I. ANALOG SIGNAL LINE FILTER: Provide an analog signal Line Filter (LF-WW), per Component Specifications, for the wetwell level/meter controller.

J. BRANCH CIRCUIT BREAKERS: Provide the following 120 Volt, single-phase branch circuit breakers.

1. 20 Amp – 1 Pole, for Control Power and Alarm Light
2. 20 Amp – 1 Pole, for Weatherproof GFCI Duplex Receptacle
3. 20 Amp – 1 Pole, for Panel Exhaust Fans/Cabinet Lights
4. 20 Amp – 1 Pole, for Spare

K. CONTROL POWER SURGE PROTECTOR: Provide a single phase, in-line (series) 120 volt, single-phase, 20A continuous power Surge Protection Device (SPD-2), per Component Specifications, designed to protect all of the loads fed from the control power circuit. Device shall have protection modes and protection status indication of each mode when power is present (L-N, L-G, N-G).

L. GROUND FAULT INTERRUPTER RECEPTACLE: Provide a 120 Volt, 15 amp, Weatherproof Duplex GFCI Receptacle mounted on the side of enclosure for electrical hand tool use. Receptacle shall come complete with a weatherproof cover. Cover shall be UL listed for wet locations, with cover closed, and shall be constructed of tough plastic that is resistant to high impact and sunlight. In addition, the cover shall be non-corrosive, non-conductive and protect against rain, snow and ice.

M. CABINET INTERIOR LIGHTS: Provide (2) two 120Vac LED interior panel lights (CL1 & CL2) switching via movement detector. Panel lights shall be mounted at the top of the interior of the control panel to automatically illuminate the interior deadfront doors and the backplate of the enclosure. Interior lights shall be Finder model number 7L43.0.230.2200, or approved equal.

N. ENCLOSURE EXHAUST FAN: Provide four (4) filtered steel louvers and two (2) six-inch (6”) thermostatically controlled exhaust fans to properly ventilate the controller enclosure. Exhaust fans shall operate based on temperature setting or when the variable frequency drive operates. Exhaust fan shall be mounted near the top of the enclosure. In addition, provide a Thermostat (TH), per Component Specifications, to control the exhaust fans.

O. COMMON ALARM LIGHT: Provide a weatherproof exterior Alarm Light (AL), per Component Specifications, with red push-to-test pilot light enclosed in a cast aluminum box with a one hole plate mounted on top of the enclosure with a myers hub. The alarm light shall burn dim and steady during normal conditions to indicate electrical power “ON” and lamp good. During any alarm condition, the alarm light shall flash brightly.

PART 4 FIELD INSTRUMENTATION

4.01 SUBMERSIBLE PRESSURE/LEVEL TRANSMITTER: Provide a Submersible Pressure/Level Transmitter (LT-WW), per Component Specifications, for the lift station wetwell (see detail on drawings). Submersible pressure/level transmitter shall provide an analog level signal to the wetwell level/meter controller, proportional to the level in the wetwell.

SUBMERSIBLE PRESSURE/LEVEL TRANSMITTER INSTALLATION: The submersible pressure/level transmitter shall be field installed by the Contractor, per project engineer’s direction.

Transmitter shall be suspended six-inches (6") above the bottom of the storage unit.

JUNCTION BOX AND ANALOG SIGNAL LINE FILTER: Provide and install a properly sized NEMA 4 rated junction box, suited for outdoor/wet locations, complete with an analog signal Line Filter (LF), per Component Specifications, for the submersible pressure/level transmitter. Junction shall have a 1/8" drain/breather hole installed in the bottom of the enclosure. Line filter shall protect associated equipment from transient voltage surges and induced voltages. Junction box shall be field installed by the Contractor in close proximity of the submersible pressure level transmitter. The Contractor shall be responsible for properly sealing the conduits entering the junction box.

4.02 AUXILIARY BACKUP FLOAT SWITCHES: Provide a backup float control system, as shown on the drawing, to operate the pumps in the event of a Submersible Pressure/Level Transmitter failure. Provide four (4) back-up Float Switches (F), per Component Specifications, mounted in wetwell. Backup float switches shall be set at one foot (1') above normal level inputs from the primary digital meter/controller. Normal operating levels shall be set per Project Engineers direction.

4.03 FREE STANDING ENCLOSURE MOUNTING: Control panel's free-standing double-door enclosures leg stands shall be securely fastened to concrete base with wedge anchors, sleeve anchors, drop-in anchors or equivalent. All mounting hardware shall be hot dipped galvanized or stainless steel. Zinc plated material shall not be accepted. Anchor embedment shall be a minimum of three inches (3"). Control panel(s) shall be accurately leveled following the manufacturer's instructions. The leveling shall be checked in the presence of the Project Engineer and shall be to then engineer's satisfaction. Control panel installation shall be the responsibility of the **Contractor**.

4.04 RESPONSIBILITY: The Contractor shall be responsible for coordinating all work covered in this section with the Association, Contractor and Engineer. All work shall be performed based on the standards of the National Electric Code (NEC) currently in force by the Authority Having Jurisdiction (AHJ).

4.05 CONDUITS: All conduits entering control panels shall be properly sealed, per plans, to ensure corrosive gasses, and water/moisture does not enter into panel. It is the responsibility of the Contractor to provide and install adequate conduit seals. It is recommended that re-enterable sealant compounds are used; equal to 3M Scotchcast 2112C or Alesko Epoxy Sealing Putty.

4.06 GROUNDING: All control panels shall be properly grounded per Section 16060 – Grounding and Bonding for Electrical Systems. The Contractor shall provide certified test reports of ground resistance.

A. Certification that the materials and installation are in accordance with the drawings and specifications.
B. Certification by the Contractor that the complete installation has been properly installed and tested.

PART 5 COMPONENT SPECIFICATIONS

5.01 PHASE FAILURE/UNBALANCE/UNDER VOLTAGE/REVERSAL RELAY: Phase monitor shall be designed to protect 3-phase motors regardless of size and for use with 200 – 240 or 425 – 485

VAC, 50 to 60 Hz motors to prevent damage. The unit shall constantly monitor the three phase voltages to detect harmful power line conditions, caused by single phasing, low voltage, phase reversal and voltage unbalance. When a harmful condition is detected, an output relay is deactivated after a trip delay. The output relay shall reactivate after power line conditions return to an acceptable level for the specified Restart Delay. The trip delay shall prevent nuisance tripping due to rapidly fluctuating power line conditions. Phase monitor shall have the following features and functions.

A. Under Voltage:
   Trip: -15% of setting for 230V (-10% for 480V)
   Reset: -12% of setting for 230V (-8% for 480V)
B. Over Voltage:
   Trip: -15% of setting for 230V (-10% for 480V)
   Reset: -12% of setting for 230V (-8% for 480V)
C. Phase Unbalance:
   Trip: 7% with 5 second trip delay
   15% with 1 second trip delay
   Reset: 6%
D. Trip Delay:
   5 seconds (delay is reduced to 1 second if Phase Unbalance is 15% or greater)
E. Reset Delay:
   2 seconds standard (5-60 seconds optional)
F. Voltage Range: 200V to 240V or 425V to 525V
G. Output Rating: 10A resistive @ 240VAC
   6A resistive @ 240VAC
H. Operating Temp: -40ºC to +50ºC, -38ºF to +122ºF
I. Storage Temp: -45ºC to +85ºC, -47ºF to +185ºF
J. Enclosure: Lexan, surface mount
K. UL and cUL listed

TAG	SERVICE
PM	Electrical System Power Monitor

5.02 VARIABLE FREQUENCY DRIVE: Variable Frequency Drives shall conform to the following specifications:

A. General Requirements

1. The VFD shall convert the input AC main power to an adjustable frequency and voltage as defined in the following sections.
2. The VFD shall be listed and labeled as a complete unit and shall include all accessories and requirements as described in this section.

B. Certifications

1. Listed to UL508C and CAN/CSA-C22.2 No. 14-05
2. In conformity with EMC Directive (2004/108/EC) and Low Voltage Directive (2006/95/EC). Standards applied; EN 61800-3:2004, EN 61800-5-1:2007

3. TÜV Rheinland - standards applied: EN 61800-3:2004, EN 61800-5-1:2007, EN ISO 13849-1:2008, EN ISO 13849-2:2003, EN 61800-5-2:2007, EN 61508 PARTS 1-7:2000, EN 62061:2005, and EN 60204-1:2006
4. Electric Power Research Institute. Certified compliant with standards SEMI F47 and IEC 61000-4-34

C. Hardware

1. Utilize Diode Bridge or SCR Bridge on the input rectifier.
2. Utilize DC bus inductor on all six-pulse VFDs only.
3. Utilize switching logic power supply operating from the DC bus.
4. Incorporate phase to phase and phase to ground MOV protection on the AC input line.
5. Microprocessor based inverter logic shall be isolated from power circuits.
6. Utilize latest generation IGBT inverter section.
7. Battery receptacle for Lithium battery power to the Real Time Clock.
8. Additional DPI port for handheld and remote HIM options.
9. Dedicated Digital Input for hardware enable.
10. Conformal coated printed circuit boards.
11. Optional onboard 24V DC Auxiliary Control Power Supply.

D. Control Logic

1. Ability to operate with motor disconnected.
2. Provide a controlled shut down, when properly protected, with no component failure in the event of an output phase to phase or phase to ground short circuit. Provide annunciation of the fault condition.
3. Provide multiple programmable stop modes including Ramp, Coast, DC-Brake, Ramp-to Hold, Fast Braking, and Current Limit Stop.
4. Provide multiple acceleration and deceleration rates.
5. Adjustable output frequency up to 650Hz.

E. Motor Control Modes

1. Selectable Sensorless Vector, Flux Vector, V/Hz, and Adjustable Voltage
2. Control modes selectable through programming.
3. The drive shall be supplied with a Start-up and Auto-tune mode.
4. The V/Hz mode shall be programmable for fan curve or full custom patterns.
5. Capable of Open Loop V/Hz.

F. Current Limit

1. Programmable current limit from 20 to 160% of rated output current.
2. Current limit shall be active for all drive states: accelerating, constant speed and decelerating.
3. The drive shall employ PI regulation with an adjustable gain for smooth transition in and out of current limit.

G. Acceleration / Deceleration

1. Accel/Decel settings shall provide separate adjustments to allow either setting to be adjusted from 0 to 3600 seconds.
2. A second set of remotely selectable accel/decel settings shall be accessible through digital inputs.

H. Speed Profiles

1. Programming capability shall allow the user to produce speed profiles with linear acceleration/deceleration or "S Curve" profiles that provide changing accel/decel rates.
2. S Curve profiles shall be adjustable.

I. Adjustments

1. A digital interface can be used for all set-up, operation and adjustment settings.
2. All adjustments shall be stored in nonvolatile memory (EEPROM).
3. EEPROM memory for factory default values shall be provided.

J. Process PID Control

1. The drive shall incorporate an internal process PI regulator with proportional and integral gain adjustments as well as error inversion and output clamping functions.
2. The feedback shall be configurable for normal or square root functions. If the feedback indicates that the process is moving away from the set-point, the regulator shall adjust the drive output until the feedback equals the reference.
3. Process control shall be capable of being enabled or disabled with a hardwire input. Transitioning in and out of process control shall be capable of being tuned for faster response by preloading the integrator.
4. Protection shall be provided for a loss of feedback or reference signal.

K. Skip Frequencies

1. Three adjustable set points that lock out continuous operation at frequencies which may produce mechanical resonance shall be provided.
2. The set points shall have a bandwidth adjustable from Maximum Reverse
3. Speed to Maximum Forward Speed.

L. Fault Reset / Run

1. The drive shall provide up to nine automatic fault reset and restarts following a fault condition before locking out and requiring manual restart.
2. The automatic mode shall not be applicable to a ground fault, shorted output faults and other internal microprocessor faults.
3. The time between restarts shall be adjustable from 0.5 seconds to 30 seconds.

M. Run on Power Up

A user programmable restart function shall be provided to allow restart of the equipment

after restoration of power after long duration power outages. Restart time dependent on presence of incoming signal.

N. Fault Memory

1. The last 32 fault codes shall be stored and time stamped in a fault buffer.
2. Information about the drive's condition at the time of the last fault such as operating frequency, output current, dc bus voltage and twenty-seven other status conditions shall be stored.
3. A power-up marker shall be provided at each power-up time to aid in analyzing fault data.
4. The last 32 alarm codes shall be stored and time stamped for additional troubleshooting reference.

O. Overload Protection

1. The drive shall provide internal class 10 adjustable overload protection.
2. Overload protection shall be speed sensitive and adjustable.
3. A viewable parameter shall store the overload usage.

P. Auto Economizer

1. An auto economizer feature shall be available to automatically reduce the output voltage when the drive is operating in an idle mode (drive output current less than programmed motor FLA). The voltage shall be reduced to minimize flux current in a lightly loaded motor thus reducing kW usage.
2. When the load increases, the drive shall automatically return to normal operation.

Q. Terminal Blocks

1. Separate terminal blocks shall be provided for control and power wiring.
2. I/O terminal blocks shall be removable with wiring in place.

R. Flying Start

The drive shall be capable of determining the speed and direction of a spinning motor and adjust its output to "pick-up" the motor at the rotating speed. This feature is disabled by default.

S. Inputs and Outputs

1. The Input / Output option modules shall consist of both analog and digital I/O.
2. No jumpers or switches shall be required to configure digital inputs and outputs.
3. All digital input and output functions shall be fully programmable.
4. The control terminal blocks shall be rated for 115V AC.
5. Inputs shall be optically isolated from the drive control logic.
6. The control interface card shall provide input terminals for access to fixed drive functions that include start, stop, external fault, speed, and enable.
7. The VFD shall be capable of supporting up to 7 analog inputs, 7 analog outputs,

21 digital inputs, 7 relay outputs, 7 transistor outputs, and 3 positive temperature coefficient (PTC) inputs.

8. The Input / Output option modules shall have the following features:

a) Analog Inputs:

i. Quantity two (2) differentially isolated, ±10V (bi-polar), 88k ohm input impedance, 11 bit plus sign.
ii. Analog inputs shall be user programmable for a variety of uses including frequency command and process loop input. Analog inputs shall be user programmable for function scaling (including invert), offset, signal loss detect and square root.

b) Analog Outputs:

i. Quantity two (2) ±10V (bi-polar) / 11 bit & sign, 2 kΩ minimum load, 4-20 mA, 11 bit plus sign, 400 Ω maximum load.
ii. The analog output shall be user programmable to be proportional to one of fourteen process parameters including output frequency, output current, encoder feedback, output power.
iii. Programming shall be available to select either absolute or signed values of these parameters.

c) Digital Inputs:

i. Quantity of six (6) digital inputs rated 24V DC/115V AC.
ii. All inputs shall be individually programmable for multiple functions including: Start, Run, Stop, Auxiliary Fault, Speed Select, Jog and Process PI functions.

d) Digital Outputs:

i. At least one (1) relay output (N.O. or N.C.).
ii. For 240V AC or 24V DC, N.O. contact output ratings shall be 2 amp max., general purpose (inductive)/resistive. N.C. contact output ratings shall be 2 amp max., resistive only.
iii. Relays shall be programmable to multiple conditions including: Fault, Alarm, At Speed, Drive Ready and PI Excess Error.
iv. Timers shall be available for each output to control the amount of time, after the occurring event, that the output relay actually changes state.
v. At least one (1) transistor output.
vi. For 24V DC, transistor output rating shall be 1 amp max, Resistive.

T. Reference Signals

1. The drive shall be capable of using the following input reference signals:

a) Analog inputs
b) Preset speeds
c) Remote potentiometer
d) Digital MOP
e) Human Interface Module
f) Communication modules

U. Loss of Reference

1. The drive shall be capable of sensing reference loss conditions.
2. In the event of loss of the reference signal, the drive shall be user programmable to the following:

   a) Fault the drive and coast to stop.
   b) Issue a minor fault - allows the drive to continue running while some types of faults are present.
   c) Alarm and maintain last reference.

3. When using a communications network to control the drive, the communications adapter shall have these configurable responses to network disruptions and controller idle (fault or program) conditions:

   a) Fault
   b) Stop
   c) Zero Data
   d) Hold Last State
   e) Send Fault Configuration

V. Metering

1. At a minimum, the following parameters shall be accessible through the Human Interface Module, if installed:

   a) Output Current in Amps
   b) Output Voltage in Volts
   c) Output Power in kW
   d) Elapsed MWh
   e) DC Bus Voltage
   f) Frequency
   g) Heatsink Temperature
   h) Last eight (32) faults
   i) Elapsed Run Time
   j) IGBT Temperature

W. Faults

1. At a minimum, the following faults shall be accessible through the Human Interface Module:

a) Power Loss
b) Undervoltage
c) Overvoltage
d) Motor Overload
e) Heat Sink Over-temperature
f) Maximum Retries
g) Phase to Phase and Phase to Ground Faults

X. Predictive Diagnostics

1. At a minimum, the following predictive diagnostic features shall be provided:

a) Relay Output Life Cycles based on load type and amps.
b) Hours of Fan Life based on load and ambient temperature.
c) Motor Bearing life based on expected hours of use.
d) Motor Lubrication schedule based on hours of use.
e) Machine Bearing life based on expected hours of use.

Y. Real-Time Clock

1. Shall be capable of providing time stamped events.
2. Shall have the ability to be set locally or via a remote controller.
3. Shall provide the ability to be programmable for month, day, year and local time zones in HH:MM:SS.

Z. Installation: Installation shall be in compliance with manufacturer's instructions, drawings and recommendations.

AA. Start-up

1. Certified factory start-up shall be provided for each VFD provided.
2. Service engineers shall be employed by the manufacturer or be certified by the manufacturer and provide start-up services including physical inspection of drive and connected wiring and final adjustments to meet specified performance requirements.

BB. Product Support

1. Factory trained application engineering and service personnel that are familiar with the VFD products offered shall be locally available.
2. A 24 hour, 365 day technical support line shall be available.

CC. Manufacturers

1. Allen-Bradley – PowerFlex 753 VFD.
2. Invertek – Optidrive
3. Danfoss – VLT Aqua
4. Substitutions must be submitted in writing three (3) weeks prior to original bid date with supporting documentation demonstrating that the alternative manufacturer

meets all aspects of the specification herein.

DD. Warranty: The manufacturer shall provide their standard parts warranty for eighteen (18) months from the date of shipment or twelve (12) months from the date of being energized, whichever occurs first. Warranty shall be twenty-four (24) months from the date of certified start-up, not to exceed thirty (30) months from the date of shipment.

TAG	SERVICE
VFD	Variable Frequency Drive (Qty. 3)

5.03 LINE REACTOR: Provide a Line Reactor for each Variable Frequency Drive being furnished. The Reactor shall be properly rated for the motor amperes required. The Reactor shall have a 5% filter rating to alternate harmonics and provide protection from transients. Line reactor(s) shall have the following features.

A. Standard impedance values by calculation: 1.5%, 2%, 3%, 4%, 5% available
B. Impedance Basis: Reactor rated current, line voltage, frequency and inductance
C. Service Factor: Reactors rated 1 to 750 Amps - 150% of rating; Reactors rated above 750 Amps - 125% of rated minimum.
D. Overload Rating: 200% of rated for 30 minutes; 300% of rated for 1 minute
E. Maximum System Voltage: 600 Volts (units with terminal blocks); 690 Volts (units with box lugs or tab terminals)
F. Maximum Switching Frequency: 20 kHz
G. Insulation System: Class N (200°C *392°F*)
H. Temperature Rise (o*pen or enclosed reactors*): 135°C *275°F* (maximum)
I. Ambient Temperature (o*pen or enclosed reactors*): 45°C *113*°F (Full rated)
J. Altitude (*maximum*): 1000 meters
K. Fundamental Frequency *(Line or Load*): 50/60 Hz
L. Approvals: CE, UL-508, CSA C22.2
M. Inductance Curve *(typical)*: 100% at 100% current; 100% at 150% current; 50% at 350% current (minimum)
N. Inductance Tolerance: +/- 10%
O. Impregnation: High Bond Strength "Solvent-Less" Epoxy, 200° C; UL94HB recognized
P. Dielectric Strength: 3000 volts RMS (4243 volts peak)
Q. dV/dT Protection: Meets NEMA MG-1, part 31 (same as inverter duty motors)
R. Agency Approvals: UL-508 File E180243 Component Listed (1 amp – 2400 amps); UL-508 File E180243 UL Listed NEMA 1 units (1 amp – 2400 amps)
Note: Short Circuit rating not required under Exception No.1 of UL508A SB4.2.1 effective 4/25/06; CSA C22.2 File LR29753-13 CSA Certified (1 amp – 2400 amps); Class N, 200° C File E66214, Type 200-18, UL Recognized Insulation System; CE Marked
S. Material: Core Steel: Electrical grade high frequency silicon steel; Windings: High dielectric withstand solid copper conductor (220° C); Enclosures: Sheet steel per UL and CSA requirements. Painted ANSI-61 Grey; Brackets: ASTM structural steel or structural aluminum; Sheet Insulation: DuPont Nomex 410 (220° C); Epoxy: Ripley Resin Type 468-2 (220° C)
T. Construction: CORE: Electrical grade silicon steel magnetic laminations; Windings: 3000 volts RMS dielectric strength (coil-to-coil & coil-to-core);
U. Assembly: Windings are assembled onto EI laminations, secured in place & epoxy impregnated for minimum noise & maximum structural rigidity.

V. Testing: Inductance, Hi-Pot 3000 Volts RMS (5656 volts peak)

TAG	SERVICE
LR	VFD Line Reactor (Qty. 3 – if required)

5.04 QUADRAPLEX PUMP CONTROLLER: Provide a Quadraplex Pump Controller, including the following features for each pump:

A. OPERATORS AND INDICATORS

1. Manual-Off-Automatic selector switch
2. Green “Running” pilot light
3. Red “Failure” pilot light
4. Red “Seal Failure” pilot light (if required)
5. Green pump “Start” pilot lights for Lead, Lag 1, Lag 2, and Lag 3.
6. Amber pump “Stop” pilot lights for Lead, Lag 1, Lag 2, and Lag 3.

B. LEVEL INPUTS

1. Individual “Start” and “Stop” level control points shall be provided for each pump or field adjustable controls shall be provided to allow the first “Stop” level control point to stop all of the pumps.
2. Provide a High liquid level alarm input sensing point, as required for the application.
3. Provide pilot light indicators for each level input sensing point.
4. Provide manual override inputs for each pump, which can be used to override the quadraplex controller□s pump call-for outputs when the controls are in the Automatic mode. Inputs shall be provided to start or stop each pump from a remote location.
5. All pump control inputs shall be optically isolated and their power limited to 24V DC with a maximum current of 16mA DC for intrinsic safety.

C. PUMP SEQUENCING

1. Automatic pump alternations on each lead pump “Call” cycle. Pump alternation shall be field selectable to alternate on a first pump “On”, first pump “Off” basis or on a last pump “On”, first pump “Off” basis.
2. The pumps shall also alternate as lead pump, when the lead pump reaches a field adjustable running time period, which shall have a time range from 10 minutes to 21 hours.
3. Provide a field adjustable failure time delay for each pump. If a pump fails to run, or if that pump□s selector switch is placed in the off position, provide controls to start the next pump in the sequence at the failed or disabled pump□s operating call-for input setting.
4. If a pump fails to run, that pump shall automatically become the last called for pump in the operating sequence. Normal pump alternation shall resume when the failure condition is corrected and the failed pump has been reset.
5. Provide individual field adjustable time controls to delay starting each pump in the automatic mode after power failure or during initial start.

6. Provide stagger stop feature to require the pumps to stop a minimum of two (2) seconds apart during the condition that two or more pumps are running when signaled to stop. Provide stagger start feature to start the pumps a minimum of three (3) seconds apart during conditions that two are more pumps are called for simultaneously.
7. Provide controls to remove any pump(s) from the alternating sequence, making the removed pump(s) the last pump(s) to be called for if the input conditions require it.
8. Pump failure, Seal failure, High-level alarm, and Improper Sequence alarm red pilot lights shall flash when activated.
9. Provide automatic controls to alternate on Pump Failure, Seal Failure, or when a pump is running in Automatic and is manually turned off.
10. When pump seal failures are not needed, the seal failure circuitry for each pump shall be able to indicate an auxiliary condition by flashing or steady operation without interfering with the controller operation.

D. INPUT MONITORING AND CONTROL

1. The Manual-Off-Automatic switches shall bypass all of the controls and energize their respective pump outputs when placed in the Manual position. In the Manual and Off modes, pump failure alarms shall be disabled.
2. The Manual-Off-Automatic switches shall be used to reset a pump failure alarm after the failure condition has been cleared, by manually switching the failed pump to the OFF position and back to Automatic.
3. Provide automatic input sequence monitoring, such that if the first "All Pumps Stop" input fails to activate, and any two start inputs are activated, the lead pump shall start.

    a. If a third start input is activated, start the first lag pump.
    b. If a fourth start input is activated, start the second lag pump.
    c. If the high-level alarm input is activated, start all pumps.

4. When operating in a "Last On, First Off" mode, each pump that is started is turned off at the next lower start input setting during the "improper sequence". That is, the Lag 2 pump will turn off at the Lag 1 Start setting, Lag 1 will turn off at the Lead Start setting, and the Lead pump will run until the Lead Start input turns off.
5. When operating in a "First On, First Off" mode, the Lead pump will turn off first, followed by the Lag 1, Lag 2, and Lag 3 pumps.
6. Provide a red pilot light indicator to alarm "Improper Input Sequence" when any of the above-described conditions occurs. Also, provide a manual reset pushbutton switch for clearing the Improper Sequence alarm.
7. If the "improper sequence" clears itself, the pumps will return to normal operation. The alarm will continue to be energized until manually reset.

E. ANNUNCIATING

Provide individual discrete pump running output contacts for each pump.

1. Provide individual discrete "Alarm Telemetry" dry contact outputs for the following

alarms:

a. Each pump failure
b. Each pump seal failure
c. High level alarm
d. Improper level input Sequence

2. Provide a Common Alarm discrete output contact that will actuate when any alarm condition occurs.
3. Provide an exterior alarm light output, which allows the light to dim glow under normal conditions to indicate power on, and lamp good. The light shall flash brightly during any alarm condition.

TAG	SERVICE
QC1-3	Quadraplex Pump Controller

5.05 QUADRAPLEX ALARM TELEMETRY OPTION: Provide an Alarm Telemetry system for the Quadraplex Controller, which provides auxiliary normally open relay contact outputs for the following quadraplex controller alarms: Motor No.1 Failure, Motor No.2 Failure, Motor No.3 Failure, Motor No.4 Failure, Motor No.1 Seal Failure, Motor No.2 Seal Failure, Motor No.3 Seal Failure, Motor No.4 Seal Failure, Improper Sequence, One (1) Auxiliary Contact, and High Level. Provide the following features for the QCAT system.

A. Input voltage: 12VDC; Duty Cycle: Continuous

B. The control circuitry shall be solid-state and contain an integral power supply with proper surge and over-current protection.

C. Provide an individual Normally Open, Dry-Contact output for each alarm that has a contact rating of 5 Amps @ 120V AC, resistive.

D. Provide individual LED indicators for each output relay to show when each relay is energized.

E. Output terminals labeled for easy field identification.

TAG	SERVICE
QCAT	Quadraplex Alarm Telemetry System

5.06 MOTOR MONITOR: Provide an electronic solid state Motor Monitor powered by 120 volt AC that will accept a zero (0) to five (5) amp input signal condition the signal to perform ON/OFF or OPEN/CLOSE discrete dry type setpoint contact conditions based on the input signal value. The Motor Monitor shall have the following features.

A. Provide an LCD readout meter providing field adjustable scales of 0-25.0, 0-50.0, 0-100.0, 0-250, 0-500 and 0-1000 to accurately indicate the motor full load current using the 0-5 amp input signal.

B. The Monitor shall be capable of displaying motor total running time up to 99,999.9 hours

and be provided with reset capability from the rear of the monitor. The display shall include a non-volatile EEPROM memory backup that does not require battery backup during power failure.

C. Provide two (2) separate field adjustable setpoints, each with discrete, isolated sealed SPDT relay output contacts. The setting of each setpoint shall be adjustable throughout the complete signal range from the front of the Monitor. Each set point shall be provided with a field adjustable "ON" and "OFF" time delay, adjustable from zero (0) to fifteen (15) seconds. The actual setting of each setpoint shall be able to be displayed on the LCD readout at any time. An LED indicator shall be provided for each setpoint and shall operate as follows:

1. Setpoint No. 1: When setpoint is timing, the indicator shall burn amber. After timing period and current is at or above setpoint, indicator shall burn green.

2. Setpoint No. 2: When set point is timing, the indicator shall burn amber. After set timing period and current is at or above setpoint, indicator shall burn red.

TAG	SERVICE
MM-1	Pump No. 1 Motor Monitor
MM-2	Pump No. 2 Motor Monitor
MM-3	Pump No.3 Motor Monitor

5.07 CURRENT TRANSFORMER: Current transformers insulation class shall be 0.6 KV BIL, 10 KV Full Wave. They shall be manufactured to meet the requirements of UL1244 and have a minimum accuracy of 60Hz of 2%. Current transformers shall be provided with brass stud terminals and mounting bracket.

5.08 LEVEL METER/CONTROLLER: Provide an electronic, solid-state, proportional Level Meter/Controller that will accept a four (4) to twenty (20) mA or a one (1) to five (5) volt DC signal. In addition, condition the signal to provide a valid basis for control and then perform ON/OFF or OPEN/CLOSE discrete dry type set point contact conditions based on the input value of the analog input signal. The Level Meter/Controller shall have the following features.

A. Provided with a 3.5 digit LED (or LCD if required) readout meter in feet of water. The display shall be capable of being calibrated from the front of the unit and have a maximum display of 1999, with a decimal point that is user selectable.

B. The display zero indication shall be able to be offset anywhere within the range of the meter, with a minimum range of 60 counts.

C. Provide six (6) or twelve (12) separate setpoints each with discrete, isolated sealed SPDT relay output contacts.

D. Provide excitation voltage to drive a transducer/transmitter and condition its output signal to provide a continuous display of level.

E. The setpoints shall be field adjustable to operate on rising above or falling below the setpoint.

F. An LED indicator shall be provided for each setpoint to indicate when it is activated.

G. The actual setting of each setpoint shall be able to be displayed on the digital readout at any time.

H. The setting of each setpoint shall be adjustable throughout the complete signal range from the front of the meter/controller.

I. Provide a means of manually ramping the meter/controller, up and down, throughout its complete signal range, to test the operation of the setpoints.

J. The meter/controller shall come complete with a four (4) to twenty (20) mA, or a one (1) to five (5) volt DC output signal for additional monitoring and control devices.

K. Provide a signal failure relay option with two relays, to energize when the input signal goes above 20 mA or below 4 mA. The relays can energize on both high/low conditions or one can energize on high failure and the other on low failure. In addition, either relay may be set to 'flash' on and off during the failure condition. This failure alarm shall also energize a front panel flashing LED alarm indicator.

L. Provide a Lamp Test feature to test the digital display and individual LED setpoint indicators.

TAG	SERVICE	SCALE
LMC-WW	Wetwell Level Controller	0-35 feet

5.09 TELEMETRY LINE FILTER: Provide a telemetry line filter with a fast-acting design to protect data and communications equipment from transient voltage surges and induced voltages. The filter shall be a low-impedance, two-stage hybrid design with a first stage consisting of a heavy-duty energy handling gas discharge tube having a breakdown voltage rating between 200 and 350 volts. Impulse breakdown at 100 volts per microsecond shall equal 600 volts. A filter capacitor shall be connected across the lines, rated a 1kv. The second stage shall consist of two current limiting resistors, a fast-acting solid-state transient voltage surge absorber from each line to ground to protect each line up to a maximum continuous voltage of 30V AC or 38V DC with a 50 nanosecond response time. In addition, a separate bi-directional transient voltage surge absorber rated at 1500W @ 33V DC, which is connected across the two lines, for maximum protection. Integral wiring terminal blocks shall be included for both line and equipment sides of the filter. The filter shall be mountable directly on the panel backplate or be able to use track mounting if required.

TAG	SERVICE
LF-WW	Analog Signal Line Filter

5.10 SUBMERSIBLE PRESSURE/LEVEL TRANSMITTER: Provide a solid-state direct submersible level sensor and transducer designed as pressure sensor for continuous, hydrostatic level measurement in open containers/basins. Transmitter shall have a high resistance to overload and aggressive media with a ceramic diaphragm and enclosed in 316L stainless steel housing. The range of the transmitter shall be as required for the desired application with excitation voltage of 10 - 35V DC. Instrument cable shall be commercially available shielded instrument cable with a minimum of forty-five foot (45') cable length. The transmitter shall be capable of being supported by its own cable. The electronics shall be completely potted and provide a 4 – 20mA analog output to the level meter/controller. The accuracy shall be ±0.2% full scale. The transmitter shall be mounted near the bottom of the vessel with support bracket and be cable connected. Transmitter

shall have Drinking water approvals: KTW, NSF, and ACS; and approvals by: ATEX, FM, and CSA.

A.	Application:	Type of pressure: Relative Pressure, Liquids
B.	Operating Voltage:	10-30 V DC
C.	Electrical Design:	DC
D.	Output Function:	4-20 mA analog
E.	Measuring Range:	0 – 0.6 bar (0 – 8.70 psi)
F.	Pressure Rating:	4 bar (58 psi)
G.	Bursting Pressure Min.:	4.8 bar (69.62 psi)
H.	Characteristics Deviation:	< 0.25 (BFSL) / 0.5 *
I.	Connection:	PUR cable / 15 m
J.	Housing Materials:	Stainless Steel 316Ti / 1.4571; PA
K.	Medium Temperature:	-10 – 50 °C
L.	Ambient Temperature:	-10 – 50 °C
M.	Protection:	IP 68
N.	MTTF:	732 years

TAG	SERVICE	SCALE
LT-WW	Wetwell Level Transmitter	0-35 feet

5.11 FLOAT SWITCHES: The float switch shall be a direct acting switch and contain a single pole mercury switch, which actuates when the longitudinal axis of the float is horizontal and de-actuates when the liquid level falls 1" below the actuation elevation. The float shall have a chemical resistant polypropylene casing with a firmly bonded electrical cable protruding. One end of the cable shall be permanently connected to the enclosed mercury switch and the entire assembly shall be capsulated to form a completely watertight and impact resistance unit. Float shall include a bracket for support pipe mounting.

TAG	SERVICE
F	Wetwell Float Switches (Qty. 4)

5.12 VARIABLE FREQUENCY DRIVE CONTROLLER: Provide an electronic solid state controller that can be field configured or programmed to control the speed of up to four Variable Frequency Drives. The controller shall have the following features.

A. Provide four separate isolated output signals, each producing a four (4) to twenty (20) mA output to signal or pace each drive and motor.

B. Provide a 3½-digit LED readout meter on face of controller that can be field calibrated in feet, psi, temperature, etc. This readout shall indicate the value of an input 4-20 mA DC signal. The controller shall monitor this input signal and condition the four analog output signals based on this signal and the individual field set Low and High adjustment points.

C. Provide four input points to receive a dry contact positive running signal from each of four motors.

D. The operator shall be able to select a signal level at which point the drive will operate at minimum speed and a signal level at which point the drive will operate at maximum speed when the controller is receiving a positive motor running signal for one motor. As the input

signal increases from the minimum setting to the maximum setting, the drive shall increase in speed linearly. The operator shall be able to select individual minimum and maximum speed setting with one, two, three and four motors operating.

E. Provide a 3½-digit LED readout meter on face of controller indicating analog output signals to Variable Frequency Drives. Provide an inconspicuous selector switch to drive the analog output signals to four (4) or twenty (20) mA for testing purposes.

F. Provide four individual green LED pilot lights to indicate when 1, 2, 3 or 4 motor running input signals are being received.

G. Provide a Lamp Test feature to illuminate the front panel pilot lights and all digital display segments via a remote pushbutton.

H. In general, the operator shall be able to select four (4) individual speed ranges over the complete range of the input analog signal being received, selecting a Low and High speed setting for each range depending on whether 1, 2, 3 or 4 motors are operating.

I. The actual setting of each set point shall be able to be displayed on the digital readout at any time and the setting of each set point shall be adjustable, throughout the complete signal range, from the front of the controller.

TAG	SERVICE
FDC1-3	Wet Well VFD Pump Controller

5.13 THERMOSTAT: Provide a non-programmable line volt mechanical thermostat with bi-metal actuator type sensor. The thermostat shall have an adjustable temperature range of 50 to 90 degrees F with a differential of 2 to 4 degrees F. This thermostat shall have a SPDT contact rated at 120V/22A. The thermostat shall be certified UL and CSA. Enclosure shall be NEMA 1 with an external adjustment knob.

TAG	SERVICE
TH	Thermostat

5.14 CONTROL POWER SURGE PROTECTION DEVICE (SPD): The surge protection device shall be mounted in the control panel in series with the control power circuit. Provide a single-phase, in-line series AC power line surge protector with the following features:

A. Rated voltage shall be 120 VAC @ 60Hz.
B. Current rating shall be 20 Amps @ 40°C.
C. The protection circuitry shall automatically reset after the transient has passed.
D. Protection modes shall be: Line to Neutral, Line to Ground, and Neutral to Ground.
E. Provide three (3) Green LED indicators to indicate protection status of each mode when power is present (L-N, L-G, N-G).
F. Varistors with integral thermally activated elements shall be used to open in the event of overheating due to the abnormal overvoltage, limited current conditions outlined in UL1449. The lower inductance of the varistors shall result in improved clamping performance to fast overvoltage transients.

G. Metal Oxide Varistors (MOV) shall have cured, flame retardant epoxy polymer coating meeting UL94V-0 requirements.
H. Electromagnetic Interference (EMI) filtration shall be incorporated into the unit to dampen unwanted signals from the protected side of the unit.
I. Operating temperature shall be -40 to +70°C.
J. Screw terminals shall be provided for all wiring.
K. Maximum continuous operating VAC shall be 115% of rated line voltage.

TAG	SERVICE
SPD-2	Control Power Surge Protection Device

5.15 COMMON ALARM LIGHT: Alarm Light shall be RAB catalog number VBR100/GL100PGR or equal. Alarm light enclosure shall be constructed of die cast aluminum with a sturdy mounting bracket. Alarm light shall be suitable for wet location and comply with UL standard 1598, for hazardous locations where the lamp, socket and wiring require protection from rain, corrosive fumes, non-combustible dusts, moisture, non-explosive vapors and gases. The alarm light shall burn dim and steady during normal conditions to indicate electrical power "ON" and lamp good. During any alarm condition, the alarm light shall flash brightly. Alarm light mounted on the side of the enclosure or as directed by the project engineer.

TAG	SERVICE
AL	Common Alarm Light

PART 6 EXECUTION

6.01 ENGINEERING SUPERVISION

A. The services of a qualified representative of the selected Single Source System Supplier shall be provided to inspect the completed installation, suggest all adjustments necessary to place the system in proper operation, and instruct operating personnel in the care and operation of the equipment furnished. A minimum of one (1) day and one (1) trip start-up service and trainig operating personnel shall be included. The services shall be furnished by the Contractor as a part of the work included under this section of the specifications.

B. The System Supplier shall show satisfactory evidence that he maintains, a fully equipped factory organization capable of furnishing adequate service for the equipment furnished, included replacement parts. Suppliers employing outside organizations for "ON CALL" service shall not be considered.

6.02 GENERAL INSTALLATION

A. Installation of instrumentation and controls shall be in strict compliance with the manufacturer's instruction. The locations of these items as shown on the Contract Drawings are approximate only. Exact locations shall be as approved by the Engineer during construction. It is the duty of the Contractor to obtain, in the field, all relevant information required for proper placement of instrumentation and controls. In the case of interference with other work, proceed as instructed by the Engineer and provide all materials and labor required to prevent construction delays.

B. Execution of the installation shall be in full accordance with codes and local rulings. The Contractor shall be responsible for any expenses that are a result of work performed contrary to said codes and regulations.

C. The System Supplier shall coordinate with the Contractor the installation, the location of process equipment, and connections of process equipment to related equipment panels, subject to the Engineer's approval. The equipment being furnished with electrical controls or instrumentation must be submitted to the System Supplier for approval and coordination with all other control and instrumentation on this project. This engineer will not approve any equipment submittal until this coordination has been accomplished.

6.03 SPARE PARTS

A one-year supply of manufactures' recommended spare parts shall be provided. The spare parts shall be packaged for long-term storage and shall be protected against humidity and temperature. A spare parts list shall be furnished listing manufacture, device model number, part number and quantity supplied.

6.04 DELIVERY AND HANDLING

After delivery to the jobsite, the Contractor shall store the control panel off of the ground in a dry location until such time as it is mounted and supplied with electrical service. The contractor shall also ensure that the pump power and control cords, as well as control floats, are protected from submergence until they are properly installed and sealed.

6.05 CONTROL PANEL STAND (when required)

Each control panel stand shall be fabricated per the detail indicated in the plans. Control panel stand legs shall be cemented into the ground a minimum of three feet (3') deep. The control panel shall be bolted at all four corners to the control panel stand with stainless steel hardware. Control panels shall be installed following manufacturer's instructions properly leveled.

END OF SECTION

Section 14

DEPARTMENT OF UTILITIES
POST OAK SEWER CONSOLIDATION & FAUBOURG LIFT STATION IMPROVEMENTS

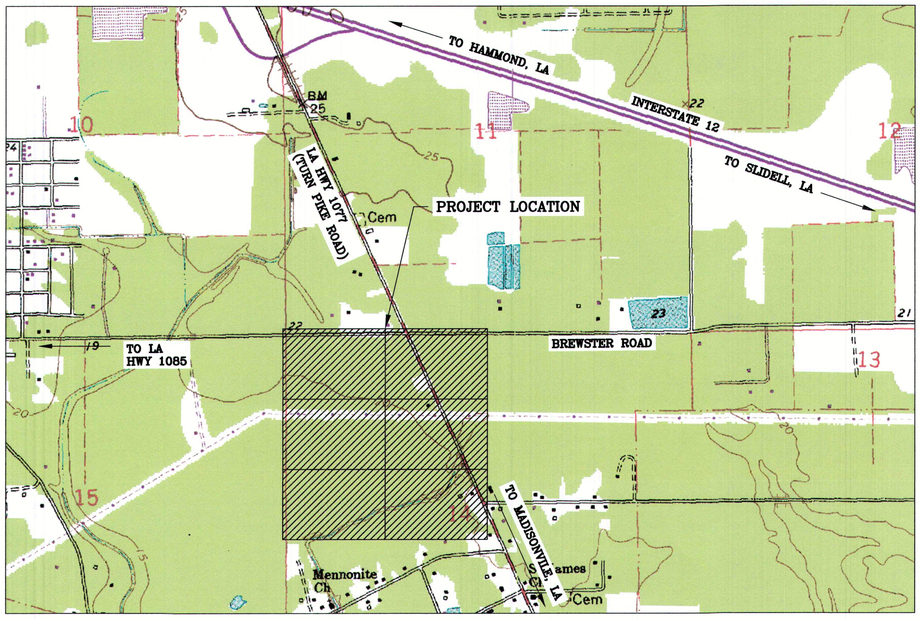
ST. TAMMANY PARISH, LOUISIANA

PROJECT No.: TU23000171 (POST OAK) & TU23000175 (FAUBOURG)

BID NO. 24-27-2

INDEX OF SHEETS:

TOTAL NUMBERS OF SHEETS = 42



LOCATION MAP

SCALE: 1"=1000'

PARISH PRESIDENT

MICHAEL B. COOPER

PARISH COUNCIL

ARTHUR LAUGHLIN
COUNCIL CHAIRMAN
DISTRICT 11

JOE IMPASTATO
COUNCIL VICE-CHAIRMAN
DISTRICT 7

COUNCIL MEMBERS

RICK SMITH	DISTRICT 1
LARRY ROLLING	DISTRICT 2
MARTHA J. CAZAUBON	DISTRICT 3
KATHY SEIDEN	DISTRICT 4
PAT PHILLIPS	DISTRICT 5
CHERYL TANNER	DISTRICT 6
JOE IMPASTATO	DISTRICT 7
PAT BURKE, III	DISTRICT 8
DAVID COUGLE	DISTRICT 9
MAUREEN "MO" O'BRIEN	DISTRICT 10
ARTHUR LAUGHLIN	DISTRICT 11
JERRY BINDER	DISTRICT 12
JEFF CORBIN	DISTRICT 13
JIMMY STRICKLAND, III	DISTRICT 14

PLANS PREPARED BY AND RECOMMENDED FOR APPROVAL:

David A. Colson — June 05, 2024

PROFESSIONAL ENGINEERING CONSULTANTS, CORP. — DATE
DAVID A. COLSON, P.E.

APPROVED BY:

Andrew M. Hutchinson FOR Director C Tissue - 25 June, 2024

ST. TAMMANY PARISH GOVERNMENT — DATE
DEPARTMENT OF UTILITIES
CHRISTOPHER P. TISSUE, P.E., DIRECTOR

CONSTRUCTION TYPE:
ABANDON EXISTING WASTEWATER TREATMENT PLANT AND WASTEWATER LIFT STATION, AND CONSTRUCT NEW WASTEWATER LIFT STATIONS, MANHOLE, WASTEWATER GRAVITY MAINS, AND FORCE MAINS.

CLASSIFICATION:
MUNICIPAL AND PUBLIC WORKS CONSTRUCTION

LDH PERMIT NO: P23-09-103-151
DOTD PERMIT NO: 62035009

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY: DAC
DRAWN BY: GFJ
CHECKED BY: TAA
SUBMITTED BY: DAC
PROJECT No.: TU23000171 TU23000175
ISSUE DATE: 05/2024
APPROVED BY: TAA
SHEET SIZE: ANSI D
SCALE: 1" = 1000'

STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26372
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171 & TU23000175

TITLE SHEET

SHEET NO.
G-001
SHEET 1 of 42

G:\11707\06 ISSUED FOR BID REVISED\01_11707_G-001_TITLE SHEET2.dwg [1] Jun 25, 2024 - 3:27pm by tammy

GENERAL NOTES:

1. THE WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.

2. SUBMIT SHOP DRAWINGS OF ALL PIPING, VALVES, ETC. TO THE ENGINEER FOR APPROVAL PRIOR TO COMMENCING WORK.

3. THE WORK SHALL BE CONFINED TO THE LIMITS OF CONSTRUCTION AS SHOWN ON THE PLANS. THE CONTRACTOR'S STAGING AND STORAGE AREAS SHALL BE LOCATED WITHIN THE LIMITS OF CONSTRUCTION. IF THE CONTRACTOR REQUIRES ADDITIONAL STAGING OR STORAGE SPACE, THE CONTRACTOR SHALL COORDINATE WITH THE OWNER TO DETERMINE AN ACCEPTABLE ON– OR OFF–SITE LOCATION.

4. THE CONTRACTOR SHALL NOT DISTURB ANY WETLANDS.

5. CONTRACTOR OPERATIONS SHALL NOT INTERFERE OR RESTRICT THE OWNER'S ACCESS AND OPERATION OF THE FACILITY.

6. NEW GRAVITY SEWER MAINS SHALL BE NO SMALLER THAN 8" INSIDE DIAMETER PVC PIPE. THE MINIMUM VELOCITY FOR A FULL FLOWING PIPE SHALL BE NO LESS THAN 2 FEET PER SECOND.

7. CONSTRUCTION PLANS ARE IN LOUISIANA STATE PLANE SOUTH COORDINATE SYSTEM. THE VERTICAL DATUM FOR ALL ELEVATIONS ARE REFERENCED TO NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88) GEOGRID 12B.

8. THE CONTRACTOR SHALL USE THE HORIZONTAL AND VERTICAL CONTROLS ESTABLISHED FOR THE PROJECT AS INDICATED IN NOTE 8.

9. THE CONTRACTOR SHALL FIELD VERIFY ALL ELEVATIONS, GRADES AND MEASUREMENTS PRIOR TO STARTING ANY CONSTRUCTION.

10. TO ENSURE THE CONSTRUCTION OPERATIONS REMAIN IN THE RIGHT–OF–WAY OR UTILITY SERVITUDE, THE CONTRACTOR SHALL STAKE THE RIGHT–OF–WAY AND/OR SERVITUDE LINE PRIOR TO COMMENCING WORK.

11. NEW SEWER MAINS SHALL BE INSTALLED USING OPEN–CUT METHODS UNLESS WHERE SPECIFIED ON THE PLANS.

12. MINIMUM COVER OVER THE NEW SEWER MAIN SHALL BE AT LEAST 3 FEET UNLESS OTHERWISE STATED IN THE PLANS OR AS APPROVED BY THE OWNER IN WRITING.

13. THE CONTRACTOR SHALL PROVIDE RED–LINE DRAWINGS TO BE USED BY THE ENGINEER OF RECORD FOR THE PROJECT IN THE PREPARATION OF RECORD DRAWINGS/AS–BUILT DRAWINGS. RECORD DRAWINGS/AS–BUILT DRAWINGS SHALL BE SUBMITTED AS PART OF THE PROJECT CLOSE–OUT DOCUMENTS.

14. EXISTING UTILITY LOCATIONS AS SHOWN ON THE PLANS ARE APPROXIMATE. THE CONTRACTOR SHALL CONTACT LOUISIANA ONE CALL TO LOCATE AND MARK SUBSURFACE UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND RESOLVING CONFLICTS WITH THE RESPECTIVE UTILITY OWNERS. A LIST OF UTILITY OWNERS AND POINTS OF CONTACT ARE PROVIDED BELOW:

AT&T
STEVE BERGERON
(985) 327–6432

ATMOS
RODNEY BABIN
(985) 290–0897

CLECO
PAUL GITZ
(985) 807–3755

15. THE CONTRACTOR SHALL VERIFY THE REQUIRED HORIZONTAL AND VERTICAL CLEARANCES WITH THE RESPECTIVE UTILITY OWNER PRIOR TO BEGINNING WORK.

16. CONCERNS REGARDING THE DEPARTMENT OF UTILITIES FACILITIES SHALL BE DIRECTED TO THE FOLLOWING PERSON:

FIELD OPERATIONS SUPERVISOR
(985) 893–1717

17. THE CONTRACTOR SHALL PROTECT SURROUNDING FACILITIES, INCLUDING BUT NOT LIMITED TO BUILDINGS, PAVEMENT, LANDSCAPING AND UTILITIES FROM DAMAGE. THE CONTRACTOR SHALL REPAIR OR REPLACE DAMAGED FACILITIES AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL REPAIR OR REPLACE DAMAGED FACILITIES TO THE OWNERS SATISFACTION.

18. LOCATIONS OF UTILITIES IDENTIFIED BY THE DEPARTMENT OF UTILITIES ARE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY ALL AFFECTED UTILITIES (I.E. WATER, SEWER, GAS, ETC.) PRIOR TO DIGGING AND/OR BORING. ANY DAMAGE SHALL BE REPAIRED IMMEDIATELY BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE PROJECT.

19. SERVICE INTERRUPTIONS ASSOCIATED WITH FINAL CONNECTIONS SHALL BE APPROVED BY THE DEPARTMENT OF UTILITIES PRIOR TO COMMENCING THE TIE–IN WORK. THE CONTRACTOR SHALL CONTACT THE DEPARTMENT AT LEAST 5 DAYS PRIOR TO HIS PROPOSED SERVICE INTERRUPTION DATE.

20. CUSTOMERS AFFECTED BY THE PLANNED SERVICE INTERRUPTION SHALL BE NOTIFIED IN WRITING 48 HOURS IN ADVANCE OF APPROVED SERVICE OUTAGE DATE.

21. THE CONTRACTOR SHALL RESTORE THE GROUND IN AND AROUND THE WORK AREA TO THE SATISFACTION OF THE OWNER. THE WORK AREA SHALL BE CLEANED AND MADE READY FOR RE–OCCUPANCY BY THE OWNER UPON COMPLETING ALL CONSTRUCTION ACTIVITIES.

22. THE WORK AREA SHALL BE KEPT CLEAN THROUGHOUT THE DURATION OF THE PROJECT. THE CONTRACTOR SHALL COLLECT AND REMOVE ANY DEBRIS OR TRASH FROM WORK AREA ON A DAILY BASIS. DEBRIS OR TRASH SHALL BE STORED IN REFUSE CONTAINERS OR BINS UNTIL REMOVAL FROM THE SITE.

23. THE CONTRACTOR MAY USE THE FAUBOURG LIFT STATION SITE AT 69445 LA HWY 1077 FOR EQUIPMENT AND MATERIAL STAGING AND STORAGE AS DIRECTED BY THE DEPARTMENT OF UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SAFE KEEPING AND SECURITY OF ALL MATERIAL AND EQUIPMENT STORED AT THIS LOCATION.

24. NOTE: THE LOCATIONS OF ALL EXISTING FORCE MAINS AND GRAVITY MAINS DEPICTED IN THE DRAWINGS ARE SHOWN AS APPROXIMATE AND ARE FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT SIZE, LOCATION, AND MATERIAL PRIOR TO CONSTRUCTION AND ORDERING MATERIAL FOR CONNECTIONS AS REQUIRED.

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	GFJ
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171 TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	N.T.S.

STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26572
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

GENERAL NOTES

SHEET NO.
G–002
SHEET 2 OF 42

GENERAL SEWER STANDARD NOTES

1. ALL MATERIALS SHALL COMPLY WITH ALL APPLICABLE AWWA STANDARDS AND SPECIFICATIONS.

2. THE CONTRACTOR SHALL PROVIDE A ONE–YEAR WARRANTY FOR ALL NEWLY INSTALLED SEWER INFRASTRUCTURE ASSOCIATED WITH THE CONSTRUCTION OF THE PROJECT, INCLUDING BUT NOT LIMITED TO ANY SEWER FORCE MAIN AND GRAVITY SEWER MAIN EXTENSIONS. THE WARRANTY SHALL EXTEND FROM THE DATE OF FINAL ACCEPTANCE. THE CONTRACTOR SHALL FURNISH ALL MATERIALS AND LABOR REQUIRED TO CORRECT DEFICIENCIES IN THE SYSTEM AT NO COST TO THE DEPARTMENT OF UTILITIES.

3. A PRE–CONSTRUCTION MEETING WITH THE DEPARTMENT OF UTILITIES, THE CONTRACTOR, AND ENGINEER OF RECORD SHALL BE HELD 30–DAYS PRIOR TO THE START OF CONSTRUCTION. THE PRE–CONSTRUCTION MEETING SHALL BE HELD ON A THURSDAY AT THE DEPARTMENT OF UTILITIES OFFICE IN COVINGTON. THE ENGINEER OF RECORD SHALL COORDINATE WITH THE DEPARTMENT OF UTILITIES TO SCHEDULE THE DATE AND TIME OF THE PRE–CONSTRUCTION MEETING.

4. PARALLEL SEWER LINES (I.E. GRAVITY SEWER LINES AND SEWER FORCE MAINS) AND WATER LINES SHALL BE LAID IN SEPARATE TRENCHES WITH THE HORIZONTAL CLEARANCE BETWEEN ALL WATER LINES AND ALL SEWER LINES OF 10'. THE HORIZONTAL CLEARANCE BETWEEN GRAVITY SEWER LINES AND SEWER FORCE MAINS SHALL BE 10'. IN THE EVENT A WATER LINE CROSSES OVER A SEWER LINE CROSS, THE MINIMUM VERTICAL CLEARANCE SHALL BE 18" BETWEEN THE WATER AND SEWER LINES. ALL SEWER LINES SHALL BE LOWER THAN WATER LINES. ANY CLEARANCES LESS THAN THE ABOVE MENTIONED SHALL BE APPROVED BY THE DEPARTMENT OF UTILITIES.

5. EXCAVATIONS FOR SEWER LINES AND STRUCTURES SHALL BE EXCAVATED, BEDDED AND BACKFILLED IN ACCORDANCE WITH THE NOTES BELOW AND THE PROVIDED SEWER DETAILS.

   a. GRAVITY SEWER MAINS AND SEWER FORCE MAINS SHALL BE BEDDED IN A CLEAN SAND COMPLYING WITH AASHTO A–3 CLASSIFICATION. THE CLEAN SAND BEDDING MATERIAL SHALL PLACED IN LOOSE 8" LIFTS AND COMPACTED TO 95% OF OPTIMAL DRY DENSITY AS DETERMINED BY ASTM D698.

   b. THE MINIMUM THICKNESS FOR PIPE BEDDING MATERIAL UNDER ALL SEWER GRAVITY MAINS AND SEWER FORCE MAINS SHALL BE 6" OR AS DICTATED BY THE RECOMMENDATIONS OUTLINED IN THE GEOTECHNICAL REPORT. THE BEDDING MATERIAL SHALL EXTEND TO THE SPRINGLINE OF THE PIPE (I.E. HALF PIPE O.D.). THE MORE STRINGENT REQUIREMENT SHALL CONTROL.

   c. WHEN A SOFT AND/OR WET EXCAVATION BOTTOM HAS BEEN ENCOUNTERED, THE EXCAVATION BOTTOM SHALL BE STABILIZED IN ACCORDANCE WITH THE RECOMMENDATIONS OUTLINED IN THE GEOTECHNICAL REPORT. HOWEVER AT A MINIMUM, A 6" THICK CRUSHED No. 57 LIMESTONE FOUNDATION SHALL BE USED TO STABILIZE A SOFT AND/OR WET EXCAVATION BOTTOM. A MINIMUM OF 6" OF THE SOFT AND/OR WET NATIVE MATERIAL SHALL BE REMOVED PRIOR TO PLACING THE CRUSHED LIMESTONE FOUNDATION. THE CRUSHED LIMESTONE FOUNDATION SHALL BE PLACE ON TOP OF A COMBINATION OF GEOTEXTILE AND BI–AXIAL GEOGRID FABRICS. THE CRUSHED LIMESTONE FOUNDATION SHALL BE PLACED IN LOOSE 8" LIFTS AND COMPACTED TO 90% OF THE RELATIVE DRY DENSITY AS DETERMINED BY ASTM D4253. THE GEOTEXTILE FABRIC SHALL ENCASE THE LIMESTONE FOUNDATION. THE MORE STRINGENT REQUIREMENTS SHALL CONTROL.

   d. SEWER FORCE MAIN VALVES AND SEWER STRUCTURES (I.E. MANHOLES, WET WELLS, VALVE VAULTS, EQUIPMENT PADS) SHALL BE CONSTRUCTED ON No. 57 CRUSHED LIMESTONE BASE. THE MINIMUM THICKNESS OF THE LIMESTONE BASE AND THE USE OF GEO–SYNTHETIC FABRICS SHALL BE DICTATED BY THE RECOMMENDATIONS OUTLINED IN THE GEOTECHNICAL REPORT. HOWEVER, THE LIMESTONE BASE SHALL HAVE A MINIMUM THICKNESS 12" UNDER SEWER STRUCTURE AND 6" UNDER SEWER FORCE MAIN VALVES. THE LIMESTONE BASE SHALL BE PLACED ON TOP OF A COMBINATION OF GEOTEXTILE AND BI–AXIAL GEOGRID FABRICS. THE CRUSHED LIMESTONE MATERIAL SHALL BE PLACED IN LOOSE 8" LIFTS AND COMPACTED TO 90% OF THE RELATIVE DRY DENSITY AS DETERMINED BY ASTM D4253. THE GEOTEXTILE FABRIC SHALL ENCASE THE LIMESTONE BASE. THE MORE STRINGENT REQUIREMENTS SHALL CONTROL.

6. THE COVER BETWEEN THE TOP OF PIPE FOR ALL SEWER LINES (I.E. GRAVITY SEWER AND SEWER FORCE MAINS) AND FINISHED GRADE SHALL BE AT LEAST 3' FOR LANDSCAPED AREAS AND 5' UNDER ROADS.

7. THE LOCATION OF ALL NEW HOUSE CONNECTIONS SHALL BE IMPRESSED INTO THE CURB FACE OR STREET SURFACE WITH THE LETTERS "H↑C" AND AN ARROW POINTING THE DIRECTION THE HOUSE CONNECTION. THE LETTERING SHALL BE 4" BY 8"; REFER TO THE SEWER STANDARD DETAILS. PRIOR THE CONSTRUCTION OF THE RESIDENCE, NEW HOUSE CONNECTIONS SHALL BE LOCATED USING A 2" BY 2" STAKE WITH A FLORESCENT GREEN FLAG/STREAMER OR PAINTED FLORESCENT GREEN FOR EASE OF LOCATING BY THE DEPARTMENT OF UTILITIES INSPECTORS. THE STAKE SHALL EXTEND AT LEAST 3 FEET FROM THE EXISTING GROUND SURFACE. THE STAKE MUST BE MAINTAINED UNTIL THE RESIDENCE HAS BEEN CONNECTED TO THE SERVICE LINE.

8. A DEPARTMENT OF UTILITIES REPRESENTATIVE SHALL BE ON–SITE FOR ALL TESTING REQUIRED FOR THE ACCEPTANCE OF THE PROJECT. THE CONTRACTOR SHALL CONTACT THE DEPARTMENT OF UTILITIES AT LEAST 48–HOURS PRIOR TO TESTING. THE CONTRACTOR SHALL CONTACT THE DEPARTMENT OF UTILITIES AT (985) 893–1717 TO SCHEDULE INSPECTIONS AND TESTING.

9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE HORIZONTAL AND VERTICAL LOCATION OF ALL NEW SEWER INFRASTRUCTURE POST–CONSTRUCTION. THE FIELD VERIFICATION DATA SHALL BE REFLECTED AND CERTIFIED IN THE RECORD DRAWINGS/AS–BUILT PLANS TO BE PREPARED BY THE ENGINEER OF RECORD FOR THE PROJECT. THE DEPARTMENT OF UTILITIES SHALL NOT ACCEPT THE PROJECT UNTIL AN ACCURATE, VERIFIED SET OF RECORD DRAWINGS/AS–BUILT PLANS FOR THE PROJECT ARE PROVIDED.

10. THE RECORD DRAWINGS/AS–BUILT PLANS SHALL CONTAIN THE FOLLOWING SHEETS OF INFORMATION:

    a. ALL SHEETS SHALL BE STAMPED WITH THE BLOCK "RECORD DRAWINGS" OR "AS–BUILT PLANS" AND SHALL BE DATED.

    b. TITLE SHEET WITH AN INDEX OF SHEETS. IF ADDITIONAL SHEETS ARE NEEDED TO CAPTURE CHANGES VIA CHANGE–ORDER/PLAN CHANGE, THESE ADDITIONAL SHEETS SHALL BE LISTED IN THE INDEX OF SHEETS AND BE ADDED AT THE END OF THE PLAN SET.

    c. GENERAL NOTES AND LEGEND. STRIKE–THROUGH NOTES WHICH DO NOT APPLY.

    d. SITE VICINITY MAP SHOWING NEW WATER AND SEWER INFRASTRUCTURE AND TIE–IN LOCATION TO THE EXISTING SYSTEM(S).

    e. PLAN AND PROFILE SHEETS

    f. SUMMARY OF MATERIAL QUANTITIES. FINAL QUANTITIES INSTALLED SHALL BE TABULATED.

    g. SUMMARY OF HOUSE CONNECTIONS. INFORMATION REGARDING THE HOUSE CONNECTIONS SHALL BE TABULATED. THE LOCATION OF EACH HOUSE CONNECTION SHALL BE DETERMINED BY MEASURING ALONG THE CENTERLINE OF THE SEWER GRAVITY MAIN FROM THE CENTER OF THE DOWNSTREAM MANHOLE. ADDITIONALLY, THE DIRECTION AND OFFSET OF EACH HOUSE CONNECTION SHALL BE MEASURED FROM THE CENTERLINE OF THE SEWER (I.E. 35' L).

    h. STANDARD DETAILS – STRIKE–THROUGH STANDARD DETAILS NOT USED.

11. PLAN AND PROFILE SHEETS IN THE RECORD DRAWINGS/AS–BUILT PLANS SHALL CONTAIN THE FOLLOWING INFORMATION AT A MINIMUM:

    a. LABEL THE CENTER–TO–CENTER DISTANCE BETWEEN MANHOLES ALONG THE DIRECTION OF FLOW IN PLAN–VIEW ONLY.

    b. LABEL THE SLOPE AND DIRECTION OF FLOW FOR ALL SEWER LINES IN PLAN–VIEW ONLY. SLOPE OF THE GRAVITY SEWER LINE SHALL BE LABELED. SLOPE SHALL BE PROVIDED AS A PERCENTAGE.

    c. LABEL TOP–OF–CASTING (TOC) AND INVERT ELEVATIONS FOR ALL MANHOLES. SHOW INVERT ELEVATIONS AND CARDINAL DIRECTION (I.E. N. INV. 20.19) FOR ALL PIPES IN THE MANHOLE

    d. SHOW AND LABEL TIE–IN LOCATIONS BETWEEN THE EXISTING AND NEW SEWER INFRASTRUCTURE.

    e. SEPARATE PLAN AND PROFILE SHEETS SHALL BE PROVIDED FOR THE LIFT STATION(S) AND FORCE MAIN(S). LABEL ALL VALVES AND FITTINGS ALONG THE FORCE MAIN. LABEL THE DISTANCE BETWEEN ALL VALVES AND FITTINGS. LABEL VERTICAL AND HORIZONTAL OFFSETS FROM PROJECT BASELINE OR DATUM.

12. THE CONTRACTOR'S REDLINE DRAWINGS SHALL NOT BE SUBSTITUTED FOR OR ACCEPTED BY THE DEPARTMENT OF UTILITIES AS RECORD DRAWINGS/AS–BUILT PLANS

13. THE CONTRACTOR FOR THE PROJECT SHALL PROVIDE RECORD DRAWINGS/AS–BUILT PLANS IN THE FOLLOWING FORMATS AND QUANTITIES: THREE (3) FULL–SIZE HARD COPIES, ONE (1) COPY IN PDF FORMAT, AND ONE (1) COPY IN AUTOCAD 2016 FORMAT.

14. THE DEPARTMENT OF UTILITIES STANDARD NOTES AND DETAILS SHALL BE MADE PART OF THE CONSTRUCTION DOCUMENTS. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS, INCLUDING THE DEPARTMENT OF UTILITIES STANDARD NOTES AND DETAILS.

SEWER MANHOLES NOTES

1. ALL NEW MANHOLES SHALL HAVE MINIMUM INSIDE DIAMETER OF 48 INCHES. ALL COMPONENTS OF THE MANHOLES (I.E. BASE, RISER, AND TOP) SHALL BE A PRE–CAST, REINFORCED CONCRETE STRUCTURE CONFORMING TO ASTM C478. THE PRE–CAST MANHOLE STRUCTURE SHALL BE DESIGNED TO MEET OR EXCEED AASHTO HS–20 LOADING.

2. CONCRETE SHALL HAVE A MINIMUM 28–DAY COMPRESSIVE STRENGTH OF 4,000 PSI. CONCRETE SHALL CONTAIN XYPEX CONTENT OF AT LEAST 3% BY WEIGHT. REINFORCING STEEL SHALL BE GRADE 60 AND CONFORM TO ASTM A615.

3. CONCRETE SHALL BE FORTIFIED WITH THE CORROSION CONTROL ADDITIVE "CON–SHIELD" IN ADDITION TO XYPEX OR XYPEX C500 BIO–SAN FOR THE FOLLOWING CONDITIONS: (1) MANHOLES RECEIVING DISCHARGE FROM A FORCE MAIN, (2) MANHOLES WITHIN 100' OF A LIFT STATION, OR (3) MANHOLES WITH A DEPTH GREATER THAN 8'. CONCRETE SHALL CONTAIN "CON–SHIELD" AT RATE OF ONE GALLON PER CUBIC YARD IN ADDITION TO XYPEX C100R AT 3% BY WEIGHT OF CEMENT OR XYPEX C500 BIO–SAN BY 1% BY WEIGHT OF CEMENT.

4. EXISTING MANHOLES TO BE REFURBISHED AND/OR TO RECEIVE FLOW FROM A SEWER FORCE MAIN SHALL BE COATED USING ONE OF THE FOLLOWING COMPOSITE LINER SYSTEMS: MADEWELL MAINSTAY (ML72 TO REBUILD TO ORIGINAL THICKNESS OR MIN. 3/8" THICKNESS, DS5 EPOXY LINER WITH 125 MILS THICKNESS), TNEMEC PERMASHIELD (SERIES 217 MORTOR CLAD TO REBUILD TO ORIGINAL THICKNESS OR MIN. 3/8" THICKNESS, SERIES 434 PERMA–SHIELD EPOXY LINER WITH 125 MILS THICKNESS), XYPEX BIO–SAN MEGAMIX 2 (MIN. 3/8" THICKNESS) OR AS SHOWN ON THE PLANS. PRIOR TO APPLYING THE SELECTED COMPOSITE LINER SYSTEM, ALL SURFACES SHALL BE PREPARED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. THE COMPOSITE LINER SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. COORDINATE WITH THE DEPARTMENT OF UTILITIES TO DETERMINE THE SCOPE OF THE MANHOLE REFURBISHMENT PRIOR TO BEGINNING WORK.

5. JOINTS IN THE MANHOLE SECTIONS SHALL BE SEALED WITH "RAM–NEK" OR A RUBBER GASKET CONFORMING TO ASTM C433. EXCESS JOINT SEALANT MATERIAL PROTRUDING FROM THE JOINT ON THE INTERIOR OF THE MANHOLE SHALL BE TRIMMED FLUSH WITH THE INTERIOR OF SURFACE OF THE MANHOLE. INTERIOR JOINTS SHALL THEN BE SEALED WITH A NON–SHRINK, NON–METALLIC GROUT.

6. ALL PIPE PENETRATIONS INTO MANHOLES SHALL BE CAST OR CORED. CONNECTION OF SEWER PIPES TO MANHOLES SHALL BE WATERTIGHT. THE CONNECTIONS SHALL BE MADE WITH AN ELASTOMERIC PIPE TO MANHOLE CONNECTOR OR BOOT CONFORMING TO ASTM C923 AND NON–METALLIC EPOXY GROUT.

7. GROUT AND MORTAR MIXES SHALL CONTAIN CONCRETE ADDITIVES LISTED IN NOTE #3 ABOVE.

8. MANHOLE FRAMES AND COVERS SHALL BE GRAY IRON CONFORMING TO ASTM A48. MANHOLE FRAMES AND COVERS SHALL BE EAST JORDAN IRON WORKS OR US FOUNDRY. ALL MANHOLE FRAMES AND COVERS SHALL BE RATED FOR AASHTO HL–93 LOADING. A "RAINSTOPPER" INSERT SHALL BE INSTALLED WITH ALL NEW MANHOLE COVERS.

9. MANHOLE COVERS SHALL HAVE DIAMOND TREAD PATTERN AND HAVE WORD "SEWER" CAST ON THE COVER.

REFER TO SHEET G-202 FOR ADDITIONAL SEWER STANDARD NOTES

SEWER LINETYPES AND SYMBOLS

SYMBOL	MEANING
SS	GRAVITY SEWER LINE
6"HC	SEWER SERVICE LINE
SFM	SEWER FORCE MAIN
EFM	EFFLUENT FORCE MAIN
	SINGLE SEWER HOUSE CONNECTION
	DUAL SEWER HOUSE CONNECTION
	SEWER CLEAN–OUT
S	SEWER MANHOLE
LS	SEWER LIFT STATION
	VALVE ON SEWER FORCE MAIN

WATER LINETYPES AND SYMBOLS

SYMBOL	MEANING
W	WATER MAIN
	SINGLE WATER SERVICE CONNECTION
	DUAL WATER SERVICE CONNECTION
	WATER METER
	FIRE HYDRANT
W	WATER VALVE & MANHOLE
	BACK FLOW PREVENTER

VALVE SYMBOLS

SYMBOL	MEANING
	CHECK VALVE
	ISOLATION VALVE
	GATE VALVE
	PLUG VALVE
	TAPPING SLEEVE AND VALVE
	AIR RELEASE VALVE
	TEE, VALVE & FIRE HYDRANT ASSEMBLY

GENERAL LINETYPES AND SYMBOLS

SYMBOL	MEANING
R/W	RIGHT–OF–WAY
	SERVITUDE / PROPERTY LINE
OHP	OVERHEAD POWER LINE
	POWER POLE
UGE	UNDERGROUND POWER LINE
T	PAD MOUNTED TRANSFORMER
GAS	GAS LINE
	GAS VALVE & MANHOLE
D	DRAINAGE CULVERT, SUBSURFACE
	TOP OF DITCH
	DRAINAGE DROP INLET OR CATCH BASIN
	DEMOLITION AND REMOVAL
	PORTLAND CEMENT CONCRETE
	GRANULAR BACKFILL, COMPACTED
	BEDDING MATERIAL, COMPACTED
	SELECT FILL (INSITU SOILS), COMPACTED

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY: DAC
DRAWN BY: GFJ
CHECKED BY: TAA
SUBMITTED BY: DAC
PROJECT No.: TU23000171
TU23000175
ISSUE DATE: 05/2024
APPROVED BY: TAA
SHEET SIZE: ANSI D
SCALE: N.T.S.

STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26372
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171 & TU23000175

SEWER STANDARD NOTES (SHEET 1 OF 2)

SHEET NO.
G–201
SHEET 3 OF 42

GRAVITY SEWER MAIN NOTES

1. NEW GRAVITY SEWER LINES BETWEEN 6" AND 15" DIAMETER, INCLUDING HOUSE SERVICE CONNECTIONS, SHALL BE POLYVINYL CHLORIDE (PVC) PIPE CONFORMING TO ASTM D3034. NEW GRAVITY SEWER LINES BETWEEN 6" AND 15" DIAMETER SHALL HAVE A PIPE STIFFNESS NO LESS THAN 115 PSI (SDR26). CONNECTIONS BETWEEN PIPE LENGTHS SHALL BE OF AN INTEGRATED "BELL AND SPIGOT" DESIGN WITH A RUBBER GASKET SEAL. RUBBER SEAL SHALL CONFORM TO ASTM F477. NEW GRAVITY SEWER LINES SHALL BE THE COLOR GREEN AND LABELED AS "SEWER".
2. NEW GRAVITY SEWER LINES BETWEEN 18" AND 48" DIAMETER SHALL BE POLYVINYL CHLORIDE (PVC) PIPE CONFORMING TO ASTM F679. NEW GRAVITY SEWER LINES BETWEEN 18" AND 48" DIAMETER SHALL HAVE A PIPE STIFFNESS NO LESS THAN 115 PSI (PS115). CONNECTIONS BETWEEN PIPE LENGTHS SHALL BE OF AN INTEGRATED "BELL AND SPIGOT" DESIGN WITH A RUBBER GASKET SEAL. RUBBER SEAL SHALL CONFORM TO ASTM F477. NEW GRAVITY SEWER LINES SHALL BE THE COLOR GREEN AND LABELED AS "SEWER".
3. NEW GRAVITY SEWER MAINS SHALL BE NO SMALLER THAN 8" INSIDE DIAMETER PVC PIPE WITH A MINIMUM SLOPE 0.4%. NEW GRAVITY SEWER MAINS SHALL HAVE MINIMUM VELOCITY OF 2 FEET PER SECOND.
4. NEW HOUSE SERVICE CONNECTIONS SHALL BE NO SMALLER THAN 6" INSIDE DIAMETER PVC PIPE. A NEW HOUSE SERVICE CONNECTIONS SHALL BE INSTALLED A PERPENDICULAR TO THE GRAVITY SEWER MAIN AND SHALL BE PROPERLY SECURED WITH A PVC CAP.
5. THE LOCATION OF THE HOUSE SERVICE CONNECTIONS SHALL BE STAMPED IN THE CURB FACE OR ROAD SURFACE USING THE LETTERING "H↑C", AND THE LETTERING SHALL BE AT LEAST 4" BY 8".
6. ALL NEW HOUSE SERVICE CONNECTIONS SHALL BE LOCATED AT THE LOT LINE. HOUSE SERVICE CONNECTION SHALL NOT BE LOCATED WITHIN THE DRIVEWAY.
7. THE GRAVITY SEWER SYSTEM SHALL BE TESTED FOR LEAKS BY SMOKE TESTING.
8. GRAVITY SEWER PIPES SHALL BE CHECKED FOR ALIGNMENT BY MANDREL TESTING AND VIDEO INSPECTION. CLEAN WATER SHALL BE INTRODUCED INTO THE GRAVITY SEWER LINE UNDERGOING VIDEO INSPECTION TO DETERMINE IF THE GRAVITY SEWER LINE HAS ANY SAGS OR HIGH POINTS THAT WILL IMPEDE FLOW. A DEPARTMENT OF UTILITIES REPRESENTATIVE SHALL BE ON-SITE DURING THE VIDEO INSPECTION.
9. IN THE EVENT A SECTION OF GRAVITY SEWER PIPE FAILS INSPECTION AND TESTING, PIPES SHALL BE RE-LAID AND RE-CHECKED AT EXPENSE OF THE CONTRACTOR.

SEWER LIFT STATION NOTES

1. WET WELLS SHALL HAVE A MINIMUM INSIDE DIAMETER OF 60 INCHES.
2. LIFT STATION SERVITUDE SHALL BE CENTERED ON THE WET WELL AND MEASURE AT LEAST 25' BY 25' UNLESS SHOWN OTHERWISE. THE ACCESS DRIVEWAY SHALL BE AT LEAST 12' WIDE. A SEPARATE SERVITUDE FOR THE ACCESS DRIVEWAY TO THE LIFT STATION SHALL BE PROVIDED IN ADDITION TO THE LIFT STATION SERVITUDE.
3. LIFT STATIONS LOCATED IN A RESIDENTIAL OR COMMERCIAL SETTING SHALL BE SECURED BY A WOODEN PRIVACY FENCE OR BUILDING STRUCTURE. THE FENCE SHALL BE CONSTRUCTED ALONG THE PERIMETER OF THE LIFT STATION SERVITUDE. THE FENCE SHALL BE 6-FEET TALL. A DOUBLE SWING GATE SHALL BE PROVIDED FOR MAINTENANCE VEHICLE ACCESS, AND THE CLEAR OPENING FOR THE GATE SHALL BE 16-FEET. THE APPROPRIATE WARNING SIGNS AND DEPARTMENT OF UTILITIES SIGNS SHALL BE ATTACHED TO THE FENCE AND GATE.
4. LIFT STATIONS LOCATED IN AN INDUSTRIAL SETTING OR ALONG A HIGHWAY SHALL BE SECURED BY A CHAIN LINK FENCE. THE FENCE SHALL BE CONSTRUCTED ALONG THE PERIMETER OF THE LIFT STATION SERVITUDE. THE FENCE SHALL BE 6-FEET TALL WITH A BARBED WIRE TOP-OF-FENCE TREATMENT. ADDITIONALLY, A DARK GREEN PRIVACY MESH FABRIC SHALL BE INSTALLED ON THE FENCE AND GATE. A ROLLER GATE SHALL BE PROVIDED FOR MAINTENANCE VEHICLE ACCESS, AND THE CLEAR OPENING FOR THE GATE SHALL BE 16-FEET. THE APPROPRIATE WARNING SIGNS AND THE DEPARTMENT OF UTILITIES SIGNS SHALL BE ATTACHED TO FENCE AND GATE.
5. ALL COMPONENTS OF THE WET WELL (I.E. BASE, RISER, AND TOP) SHALL BE A PRE-CAST, REINFORCED CONCRETE STRUCTURE CONFORMING TO ASTM C478. THE PRE-CAST WET WELL STRUCTURE SHALL BE DESIGNED TO MEET OR EXCEED AASHTO HS-20 LOADING.
6. CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI. REINFORCING STEEL SHALL BE GRADE 60 AND CONFORM TO ASTM A615. CONCRETE SHALL CONTAIN XYPEX C1000-R CONTENT OF AT LEAST 3% BY WEIGHT OF CEMENT AND SHALL BE FORTIFIED WITH A CORROSION CONTROL ADDITIVE SUCH AS "CON-SHIELD" OR XYPEX C500 BIO-SAN. CONCRETE SHALL CONTAIN "CON-SHIELD" AT RATE OF ONE GALLON PER CUBIC YARD IN ADDITION TO XYPEX C100R AT 3% BY WEIGHT OF CEMENT OR XYPEX C500 BIO-SAN BY 1% BY WEIGHT OF CEMENT. THE CONTRACTOR SHALL SUBMIT CONCRETE MIX DESIGNS FOR APPROVAL BY THE ENGINEER AND DEPARTMENT OF UTILITIES PRIOR TO ORDERING THE WET WELL.
7. JOINTS IN THE WET WELL OF THE SEWER LIFT STATION SECTIONS SHALL BE SEALED WITH A RUBBER GASKET CONFORMING TO ASTM C433. EXCESS JOINT SEALANT MATERIAL PROTRUDING FROM THE JOINT ON THE INTERIOR OF THE WET WELL SHALL BE TRIMMED FLUSH WITH THE INTERIOR OF SURFACE OF THE WET WELL. INTERIOR JOINTS SHALL THEN BE SEALED WITH A NON-SHRINK, NON-METALLIC GROUT.
8. GROUT AND MORTAR MIXES SHALL CONTAIN CONCRETE ADDITIVES LISTED IN NOTE #6 ABOVE.
9. EXISTING WET WELLS TO BE REFURBISHED SHALL BE COATED USING ONE OF THE FOLLOWING COMPOSITE LINER SYSTEMS: MADEWELL MAINSTAY (ML72 TO REBUILD TO ORIGINAL THICKNESS OR MIN. 3/8" THICKNESS, DS5 EPOXY LINER WITH 125 MILS THICKNESS), TNEMEC PERMASHIELD (SERIES 217 MORTOR CLAD TO REBUILD TO ORIGINAL THICKNESS OR MIN. 3/8" THICKNESS, SERIES 434 PERMA-SHIELD EPOXY LINER WITH 125 MILS THICKNESS), XYPEX BIO-SAN MEGAMIX 2 (MIN. 3/8" THICKNESS) OR AS SHOWN ON THE PLANS. PRIOR TO APPLYING THE SELECTED COMPOSITE LINER SYSTEM, ALL SURFACES SHALL BE PREPARED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. THE COMPOSITE LINER SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. COORDINATE WITH DEPARTMENT OF UTILITIES TO DETERMINE THE SCOPE OF THE WET WELL REFURBISHMENT PRIOR TO BEGINNING WORK.
10. ALL PIPE PENETRATIONS INTO THE WET WELL SHALL BE CAST OR CORED. CONNECTION OF SEWER PIPES TO MANHOLES SHALL BE WATERTIGHT. THE CONNECTIONS SHALL BE MADE WITH AN ELASTOMERIC PIPE TO MANHOLE CONNECTOR OR BOOT CONFORMING TO ASTM C923 AND NON-METALLIC EPOXY GROUT.
11. A COLLECTOR MANHOLE SHALL BE CONSTRUCTED IMMEDIATELY UPSTREAM OF THE WET WELL TO MINIMIZE THE NUMBER OF PENETRATIONS IN THE WET WELL WALL. THE MANHOLE AND WET WELL SHALL BE CONNECTED USING MINIMUM 12" DIAMETER GRAVITY SEWER LINE WITH MINIMUM SLOPE OF 2.5%. THE GRAVITY SEWER LINE BETWEEN THE MANHOLE AND WET WELL SHALL BE PVC PIPE CONFORMING TO THE "GRAVITY SEWER NOTES" ABOVE. THE SEALS AROUND PIPE PENETRATIONS SHALL CONFORM TO THE "GRAVITY SEWER NOTES" AND "SEWER LIFT STATION NOTES". THE COLLECTOR MANHOLE SHALL CONFORM TO THE "SEWER MANHOLE NOTES" PREVIOUSLY NOTED.
12. WET WELL HATCH FRAMES AND COVERS SHALL BE CONSTRUCTED OF ALUMINUM AND BE RATED FOR AASHTO HL-93 LOADING.

SEWER FORCE MAIN NOTES

1. NEW SEWER FORCE MAINS CONNECTING TO OTHER SEWER FORCE MAINS SHALL HAVE A MINIMUM INSIDE DIAMETER OF 4". NEW SEWER FORCE MAINS FOR LIFT STATIONS INTERIOR TO A SUBDIVISION (I.E. DAISY CHAIN OF LIFT STATIONS) SHALL HAVE A MINIMUM INSIDE DIAMETER OF 3".
2. MINIMUM VELOCITY IN ALL SEWER FORCE MAINS SHALL BE 3 FEET PER SECOND. MAXIMUM VELOCITY IN ALL SEWER FORCE MAINS SHALL NOT EXCEED 8 FEET PER SECOND. VELOCITIES IN EXCESS OF 8 FEET PER SECOND SHALL APPROVED BY THE DEPARTMENT OF UTILITIES.
3. NEW SEWER FORCE MAINS SHALL BE POLYVINYL CHLORIDE (PVC) PIPE CONFORMING TO AWWA C900 OR HIGH-DENSITY POLYETHYLENE (HDPE) PIPE CONFORMING TO AWWA C906.
4. SEWER FORCE MAINS CONSTRUCTED USING PVC PIPE BETWEEN 4" AND 30" DIAMETER SHALL BE AWWA C900 DR-18. CONNECTIONS BETWEEN PIPE LENGTHS OF PVC SHALL BE OF AN INTEGRATED "BELL AND SPIGOT" PUSH-ON DESIGN WITH A RUBBER GASKET SEAL. RUBBER SEAL SHALL CONFORM TO AWWA C111. NEW SEWER FORCE MAINS SHALL BE THE COLOR GREEN AND LABELED AS "SFM".
5. SEWER FORCE MAINS CONSTRUCTED USING PVC PIPE 3" AND 30" DIAMETER SHALL BE A PRESSURE CLASS OF 160 PSI (SDR26). CONNECTIONS BETWEEN PIPE LENGTHS OF PVC SHALL BE OF AN INTEGRATED "BELL AND SPIGOT" PUSH-ON DESIGN WITH A RUBBER GASKET SEAL. RUBBER SEAL SHALL CONFORM TO AWWA C111. NEW SEWER FORCE MAINS SHALL BE THE COLOR GREEN AND LABELED AS "SFM".
6. ALL SEWER FORCE MAINS CONSTRUCTED USING HDPE PIPE BETWEEN 4" AND 48" DIAMETER SHALL HAVE A MINIMUM PRESSURE CLASS OF 160 PSI (DR13.5) AND CONFORM TO DUCTILE IRON PIPE SIZES (DIPS). CONNECTIONS BETWEEN PIPE LENGTHS SHALL BE FUSED IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS AND RECOMMENDATIONS. NEW HDPE SEWER FORCE MAINS SHALL BE THE COLOR BLACK WITH A GREEN STRIPE. CONNECTIONS TO OTHER SEWER FORCE MAINS, INCLUDING THOSE OF DIFFERENT MATERIAL, SHALL BE MADE USING THE APPROPRIATE ADAPTERS AND FITTINGS.
7. NEW SEWER FORCE MAINS INSTALLED USING HORIZONTAL DIRECTIONAL DRILLING (HDD) METHODS SHALL USE HIGH-DENSITY POLYETHYLENE (HDPE) PIPE CONFORMING TO NOTE #6 ABOVE.
8. UPON COMPLETION OF SEWER FORCE MAIN CONSTRUCTION, THE DRILLING LOGS FOR ALL HDD INSTALLED FORCE MAINS SHALL BE PROVIDED WITH THE RECORD DRAWINGS/AS-BUILT PLANS. THE DRILLING LOGS SHALL CONTAIN, AT MINIMUM, THE SIZE OF THE FORCE MAIN, THE DEPTH OF INSTALLATION, AND THE LENGTH OF THE SEGMENT.
9. THE CONTRACTOR SHALL INSTALL A TRACER WIRE ALONG THE ENTIRE LENGTH OF THE FORCE MAIN. THE TRACER WIRE SHALL BE INSTALLED SIMULTANEOUSLY WITH THE FORCE MAIN.
10. JOINT RESTRAINTS FOR PVC PIPE BELL JOINTS SHALL BE RESTRAINED WITH A SERIES 1900 SERRATED RESTRAINT HARNESS MANUFACTURED BY EBBA, INC. OR APPROVED EQUAL.
11. ALL APPLICABLE FORCE MAIN JOINTS SHALL BE RESTRAINED IN ACCORDANCE WITH THE PROVIDED DETAIL. THE MINIMUM RESTRAINT LENGTH FOR PVC PIPE JOINTS SHALL BE IN ACCORDANCE WITH THE PROVIDED DETAIL.
12. NEW SEWER FORCE MAIN FITTINGS SHALL BE DUCTILE IRON FITTINGS CONFORMING TO AWWA C110/A21.10 WITH FITTING JOINTS CONFORMING TO AWWA C111/A21.11. THE DUCTILE IRON FITTING SHALL BE EPOXY COATED INSIDE AND OUT. FITTINGS SHALL BE MECHANICAL JOINT (MJ) FITTINGS. THE CONNECTION BETWEEN THE PVC FORCE MAIN AND THE FITTING SHALL BE RESTRAINED WITH A 2000PV OR 2000SV MEGA-LUG MECHANICAL JOINT THRUST RESTRAINT MANUFACTURED BY EBBA, INC. OR AN APPROVED EQUAL. THE NUTS AND BOLTS SHALL BE TEFLON COATED COR-TEN FASTENERS.
13. THE CONTRACTOR SHALL INSTALL IDENTIFICATION TAPE ALONG THE ENTIRE LENGTH OF THE NEW SEWER FORCE MAIN. IDENTIFICATION TAPE SHALL BE INSTALLED BY THE CONTRACTOR ONCE THE BACKFILL HAS BEEN PLACED AND COMPACTED TO AT LEAST 12" ABOVE THE TOP OF THE PIPE AND NOT MORE THAN 18" ABOVE THE CONNECTION.
14. AIR RELEASE VALVES (ARVS) SHALL BE LOCATED UPSTREAM OF THE LIFT STATIONS AND AT HIGH POINTS ALONG THE LENGTH OF THE FORCE MAIN. THE ARVS SHALL BE CONTAINED WITHIN A STANDARD PRE-CAST SEWER MANHOLE.
15. ALL NEW SEWER FORCE MAINS SHALL UNDERGO HYDROSTATIC TESTING TO VERIFY LEAK TIGHTNESS. NEW SEWER FORCE MAINS SHALL BE TESTED A 150 PSI FOR 2 HOURS OR AS REQUIRED BY THE SPECIFICATIONS. THERE SHALL BE NO PRESSURE DROP DURING THE TEST. IN THE EVENT THE SEWER FORCE MAIN FAILS THE TEST, THE FORCE MAIN PIPES SHALL BE CHECKED AND REPAIRED ACCORDINGLY. THE FORCE MAIN SHALL BE RE-TESTED.

REFER TO SHEET G-201 FOR ADDITIONAL SEWER STANDARD NOTES

SEWER LINETYPES AND SYMBOLS

SYMBOL	MEANING
SS	GRAVITY SEWER LINE
6"HC	SEWER SERVICE LINE
SFM	SEWER FORCE MAIN
EFM	EFFLUENT FORCE MAIN
	SINGLE SEWER HOUSE CONNECTION
	DUAL SEWER HOUSE CONNECTION
	SEWER CLEAN-OUT
S	SEWER MANHOLE
LS	SEWER LIFT STATION
	VALVE ON SEWER FORCE MAIN

WATER LINETYPES AND SYMBOLS

SYMBOL	MEANING
W	WATER MAIN
	SINGLE WATER SERVICE CONNECTION
	DUAL WATER SERVICE CONNECTION
	WATER METER
	FIRE HYDRANT
W	WATER VALVE & MANHOLE
	BACK FLOW PREVENTER

VALVE SYMBOLS

SYMBOL	MEANING
	CHECK VALVE
	ISOLATION VALVE
	GATE VALVE
	PLUG VALVE
	TAPPING SLEEVE AND VALVE
	AIR RELEASE VALVE
	TEE, VALVE & FIRE HYDRANT ASSEMBLY

GENERAL LINETYPES AND SYMBOLS

SYMBOL	MEANING
R/W	RIGHT-OF-WAY
	SERVITUDE / PROPERTY LINE
OHP	OVERHEAD POWER LINE
	POWER POLE
UGE	UNDERGROUND POWER LINE
T	PAD MOUNTED TRANSFORMER
GAS	GAS LINE
	GAS VALVE & MANHOLE
D	DRAINAGE CULVERT, SUBSURFACE
	TOP OF DITCH
	DRAINAGE DROP INLET OR CATCH BASIN
	DEMOLITION AND REMOVAL
	PORTLAND CEMENT CONCRETE
	GRANULAR BACKFILL, COMPACTED
	BEDDING MATERIAL, COMPACTED
	SELECT FILL (INSITU SOILS), COMPACTED

ST. TAMMANY PARISH GOVERNMENT

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY: DAC
DRAWN BY: GFJ
CHECKED BY: TAA
SUBMITTED BY: DAC
PROJECT No.: TU23000171
TU23000175
ISSUE DATE: 05/2024
APPROVED BY: TAA
SHEET SIZE: ANSI D
SCALE: N.T.S.

STATE OF LOUISIANA
DAVID A. COLSON
REG. NO. 28372
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171 & TU23000175

SEWER STANDARD NOTES (SHEET 2 OF 2)

SHEET NO.
G-202
SHEET 4 OF 42

ADDITIVE ALTERNATE NO. 1

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

No.	DESCRIPTION OF REVISION	DATE:

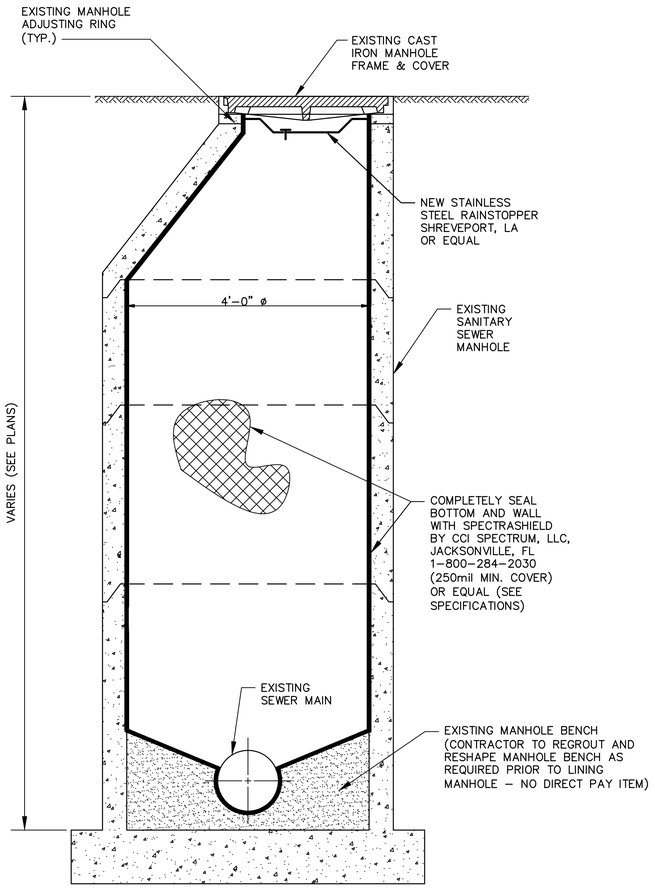
DESIGNED BY:	DAC
DRAWN BY:	TLB
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	1" = 200'

STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 28572
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

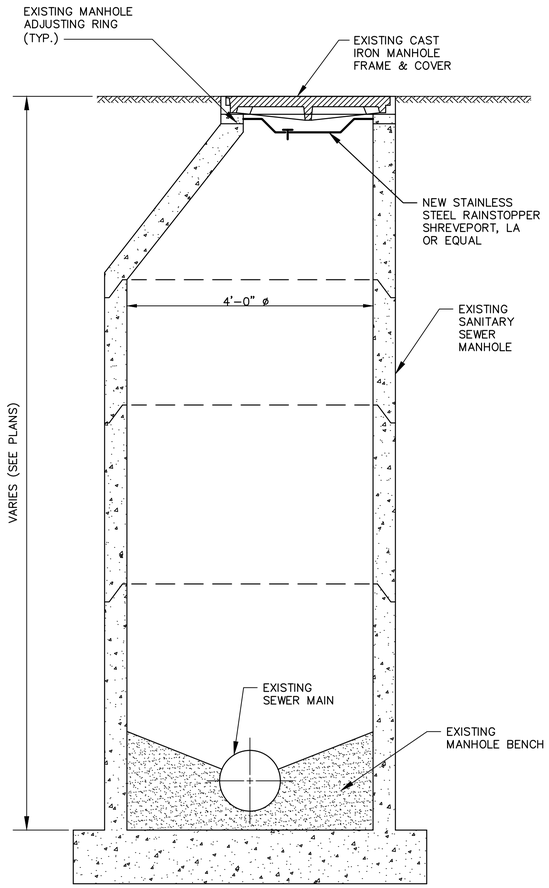
INDEX MAP FOR MANHOLE REHABILITATION

SHEET NO.
C-001
SHEET 5 of 42



TYPICAL MANHOLE REHABILITATION – (TYPE A)

NOT TO SCALE



TYPICAL MANHOLE REHABILITATION – (TYPE B)

NOT TO SCALE

GENERAL NOTES:

1. PIPING MAY BE ROTATED FOR CLARITY. VERIFY ALL ELEVATIONS AND PIPE LOCATIONS. ACTUAL NUMBER OF PIPES MAY VARY.
2. IT IS ESSENTIAL THAT THE SEWER SERVICE HAVE NO INTERRUPTION THROUGH THE DURATION OF THE WORK. IF THE STORAGE CAPACITY OF THE UPSTREAM LINE IS NOT ADEQUATE TO STORE THE FLOW DURING THE DURATION OF THE WORK OR IF THE LINE IS TO BE SHUT DOWN FOR A PERIOD GREATER THAN 2 HOURS, THEN THE CONTRACTOR SHALL PROVIDE ADEQUATE BYPASS PUMPING SO THAT THERE IS NO INTERRUPTION IN THE FLOW THROUGHOUT THE DURATION OF THE WORK. THEREFORE, CONTRACTOR SHALL PROVIDE, MAINTAIN AND OPERATE ALL TEMPORARY FACILITIES SUCH AS DAMS, PLUGS, PUMPING, EQUIPMENTS (BOTH PRIMARY AND BACK-UP UNITS) AS NECESSARY TO INTERCEPT THE FLOW BEFORE IT IMPACTS THE WORK AREA, CARRY IT PAST THE WORK AREA AND RETURN IT TO THE EXISTING SEWER SYSTEM DOWNSTREAM OF THE WORK.
3. DISCHARGE OF SEWAGE INTO PRIVATE OR PUBLIC PROPERTY, GUTTERS, STREETS, SIDEWALKS OR STORM SEWERS SHALL NOT BE PERMITTED
4. THE CONTRACTOR SHALL BE REQUIRED TO FURNISH ALL MATERIALS, LABOR, EQUIPMENT, POWER, MAINTENANCE, ETC. TO IMPLEMENT THE NECESSARY FLOW CONTROL SYSTEM AND CONTROL THE FLOW AROUND AND/OR THROUGH THE WORK AREA FOR THE DURATION OF THE WORK
5. INSTALL TEMPORARY BYPASS PUMPING AT THE MANHOLE(S) UPSTREAM OF MANHOLE TO BE REHABILITATED AS NECESSARY. THE TEMPORARY BYPASS PUMPS SHALL BE CAPABLE OF PUMPING THE PEAK WASTEWATER FLOW TO A DOWNSTREAM MANHOLE WITHOUT SURCHARGING EITHER MANHOLE. BYPASS PUMPS SHALL BE PROVIDED WITH SOUND ATTENUATION DEVICES TO MAINTAIN LEVELS AT 25 DECIBELS (dB) OR LESS. SEE SPECIFICATIONS FOR ADDITIONAL BYPASS PUMPING REQUIREMENTS.
6. ALL DEBRIS, SOLIDS OR SEMI-SOLIDS RESULTING FROM THE CLEANING OPERATIONS SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT A LEGALLY PERMITTED SITE FOR THAT PURPOSE. AT A MINIMUM ALL MATERIALS SHALL BE REMOVED FROM THE SITE AT THE END OF EACH WORKDAY.
7. THE CONTRACTOR MUST FOLLOW ALL CURRENT APPLICABLE LOCAL, STATE AND FEDERAL RULES AND LAWS REGARDING THE APPROPRIATE DISPOSAL OF WASTE MATERIALS.
8. UNDER NO CIRCUMSTANCES SHALL SOLID REMOVED IN THE CLEANING PROCESS BE DUMPED INTO STREETS, DITCHES, CATCH BASINS, STORM DRAINS, SEWER MANHOLES, WETWELLS, CLEANOUTS, OR DUMPS.

ADDITIVE ALTERNATE NO. 1

ST. TAMMANY PARISH GOVERNMENT

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	GFJ
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	N.T.S.

STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 28372
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

MANHOLE REHABILITATION DETAILS

SHEET NO.
C-201
SHEET 6 of 42

STRUCTURE NO.	APPROXIMATE DEPTH (FT.)	APPROX. LOCATION		REHABILITATION METHOD
		NORTHING	EASTING	
MH-39	8.00	708454.270286	3646650.688235	A
MH-40	7.20	708728.856977	3646470.124570	A
MH-41	6.40	708719.754697	3646224.950419	B
MH-42	6.10	708716.619028	3646132.718794	B
MH-43	5.50	708647.262204	3646006.985356	A
MH-44	5.00	708597.968745	3645764.772686	A
MH-45	3.80	708766.013211	3645628.728826	A
MH-46	4.00	708969.362598	3645631.886117	A
MH-47	5.60	709009.587244	3646215.096763	B
MH-48	5.00	709003.641072	3646040.197812	B

COORDINATE SYSTEM:
NAD83 LA STATE PLANE SOUTH

NOTE: SEE SHEET C-201 FOR MANHOLE REHABILITATION METHOD DETAILS.

BREWSTER ROAD

PRESIDENT MADISON

MH-48 — 175 L.F. OF 8" PVC — MH-47

MH-46 — 200 L.F. OF 8" PVC — MH-45 — 190 L.F. OF 8" PVC — MH-44 — 240 L.F. OF 8" PVC — MH-43 — 135 L.F. OF 8" PVC — MH-42 — 90 L.F. OF 8" PVC — MH-41 — 290 L.F. OF 8" PVC

PRESIDENT MADISON

240 L.F. OF 8" PVC — MH-40 — 325 L.F. OF 8" PVC

MUSKOGEE TRAIL

325 L.F. OF 8" PVC — MH-39

MATCH LINE SEE SHEET C-204

MATCH LINE SEE SHEET C-203

ADDITIVE ALTERNATE NO. 1

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	TLB
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	1" = 50'

STATE OF LOUISIANA
DAVID A. COLSON
REG. NO. 28372
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

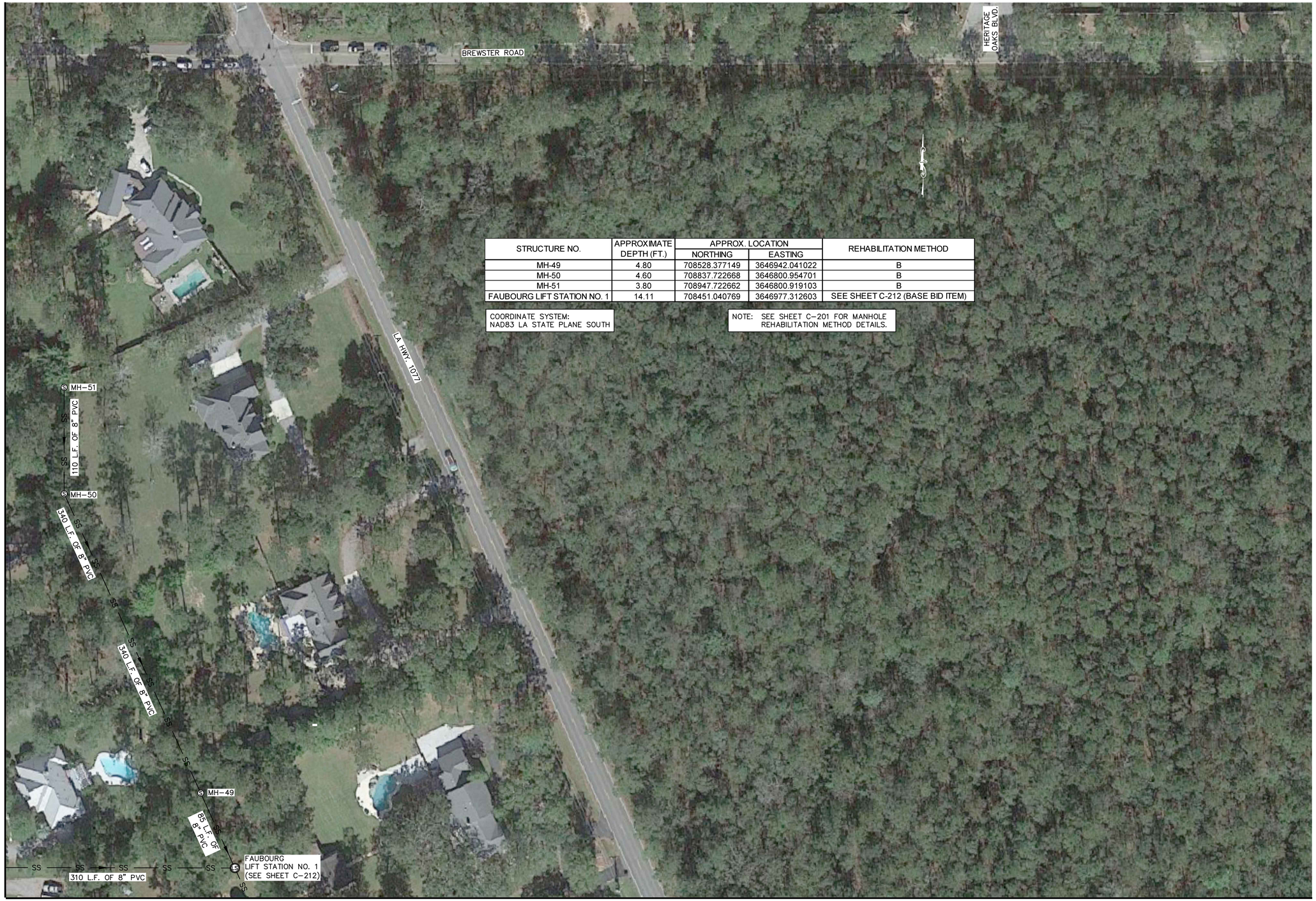
POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

MANHOLE REHABILITATION - PLAN
(SHEET 1 OF 6)

SHEET NO.
C-202
SHEET 7 of 42

G:\11707\06 ISSUED FOR BID REVISED\07-12_11707_C-202-207 SEWER REHAB PLANS.dwg [C-202 (3)] May 20, 2024 - 12:23pm by gfjohnson

MATCH LINE SEE SHEET C-202



STRUCTURE NO.	APPROXIMATE DEPTH (FT.)	APPROX. LOCATION		REHABILITATION METHOD
		NORTHING	EASTING	
MH-49	4.80	708528.377149	3646942.041022	B
MH-50	4.60	708837.722668	3646800.954701	B
MH-51	3.80	708947.722662	3646800.919103	B
FAUBOURG LIFT STATION NO. 1	14.11	708451.040769	3646977.312603	SEE SHEET C-212 (BASE BID ITEM)

COORDINATE SYSTEM:
NAD83 LA STATE PLANE SOUTH

NOTE: SEE SHEET C-201 FOR MANHOLE REHABILITATION METHOD DETAILS.

MATCH LINE SEE SHEET C-205

ADDITIVE ALTERNATE NO. 1

ST. TAMMANY PARISH GOVERNMENT

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	TLB
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	1" = 50'

STATE OF LOUISIANA
DAVID A. COLSON
REG. NO. 28572
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

MANHOLE REHABILITATION - PLAN
(SHEET 2 OF 6)

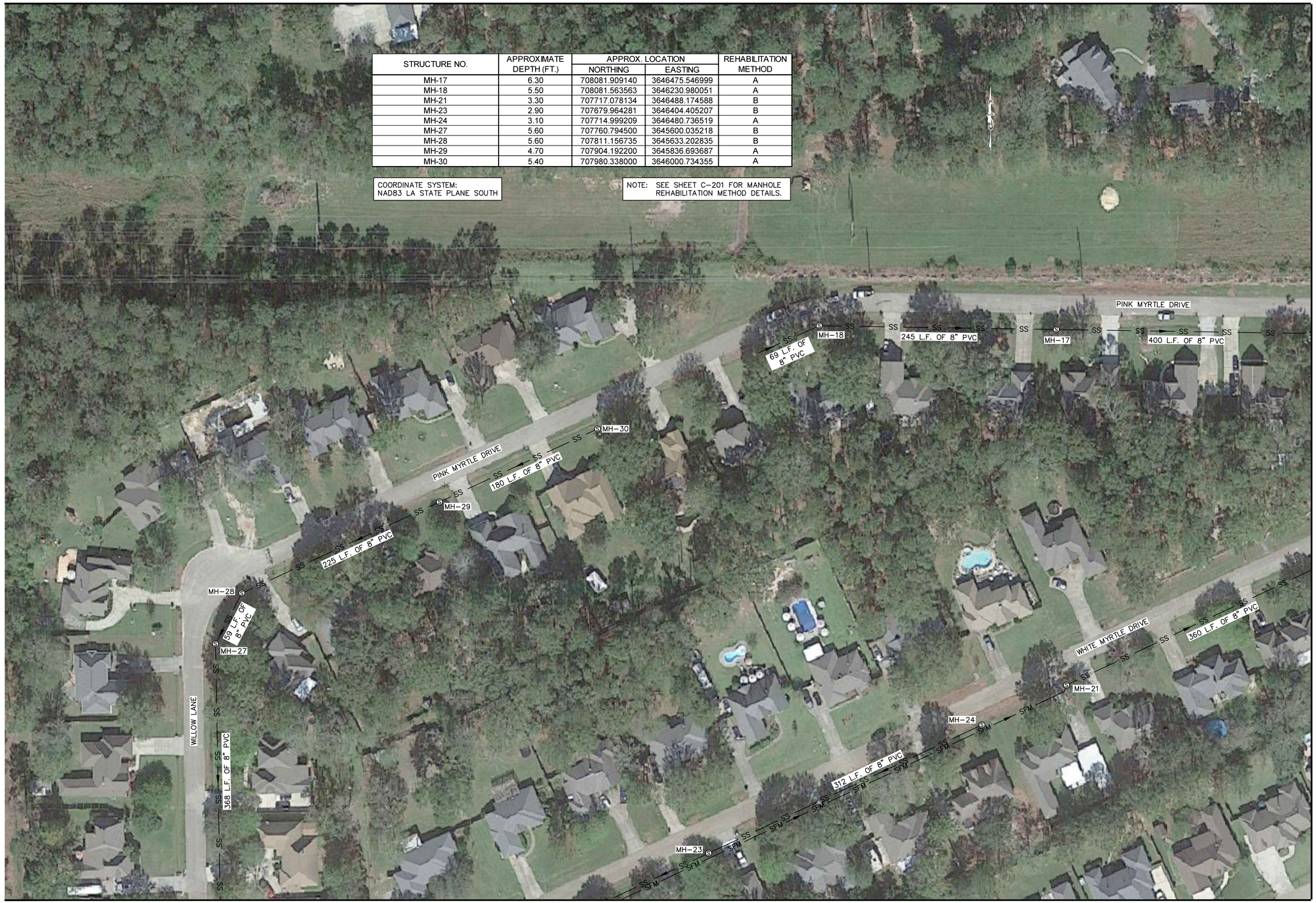
SHEET NO.
C-203
SHEET 8 of 42

MATCH LINE SEE SHEET C-202

STRUCTURE NO.	APPROXIMATE DEPTH (FT.)	APPROX. LOCATION		REHABILITATION METHOD
		NORTHING	EASTING	
MH-17	6.30	708081.909140	3646475.546999	A
MH-18	5.50	708081.563563	3646230.980051	A
MH-21	3.30	707717.078134	3646488.174588	B
MH-23	2.90	707679.964281	3646404.405207	B
MH-24	3.10	707714.999209	3646480.736519	A
MH-27	5.60	707760.794500	3645600.035218	B
MH-28	5.60	707811.156735	3645633.202835	B
MH-29	4.70	707904.192200	3645836.693687	A
MH-30	5.40	707980.338000	3646000.734355	A

COORDINATE SYSTEM:
NAD83 LA STATE PLANE SOUTH

NOTE: SEE SHEET C-201 FOR MANHOLE REHABILITATION METHOD DETAILS.



MATCH LINE SEE SHEET C-205

MATCH LINE SEE SHEET C-206

ADDITIVE ALTERNATE NO. 1

G:\11707\06 ISSUED FOR BID REVISED\07-12_11707_C-202-207 SEWER REHAB PLANS.dwg [C-204 (5)] Jun 18, 2024 - 3:11pm by gfjohnson

ST. TAMMANY PARISH GOVERNMENT

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	TLB
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171 & TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	1" = 50'

STATE OF LOUISIANA
DAVID A. COLSON
REG. NO. 28572
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

MANHOLE REHABILITATION - PLAN
(SHEET 3 OF 6)

SHEET NO.
C-204
SHEET 9 of 42

MATCH LINE SEE SHEET C-203

MATCH LINE SEE SHEET C-204

MATCH LINE SEE SHEET C-207

STRUCTURE NO.	APPROXIMATE DEPTH (FT.)	APPROX. LOCATION		REHABILITATION METHOD
		NORTHING	EASTING	
MH-6	5.40	707567.880082	3646945.933527	B
MH-7	5.50	707675.258571	3647211.078749	B
MH-8	5.10	707791.697538	3647485.914876	A
MH-9	4.90	707515.061254	3647268.685181	B
MH-16	5.30	708072.242475	3647206.151925	A
MH-19	6.00	707934.692941	3646874.124489	A
MH-20	4.70	707871.531859	3646814.324298	A
MH-52	5.10	7083238.212402	3647033.332171	B
MYRTLE GROVE LIFT STATION	10.66	708078.220039	3646877.524969	SEE SHEET C-212 (BASE BID ITEM)

COORDINATE SYSTEM:
NAD83 LA STATE PLANE SOUTH

NOTE: SEE SHEET C-201 FOR MANHOLE REHABILITATION METHOD DETAILS.

ADDITIVE ALTERNATE NO. 1

ST. TAMMANY PARISH GOVERNMENT

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	TLB
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	1" = 50'

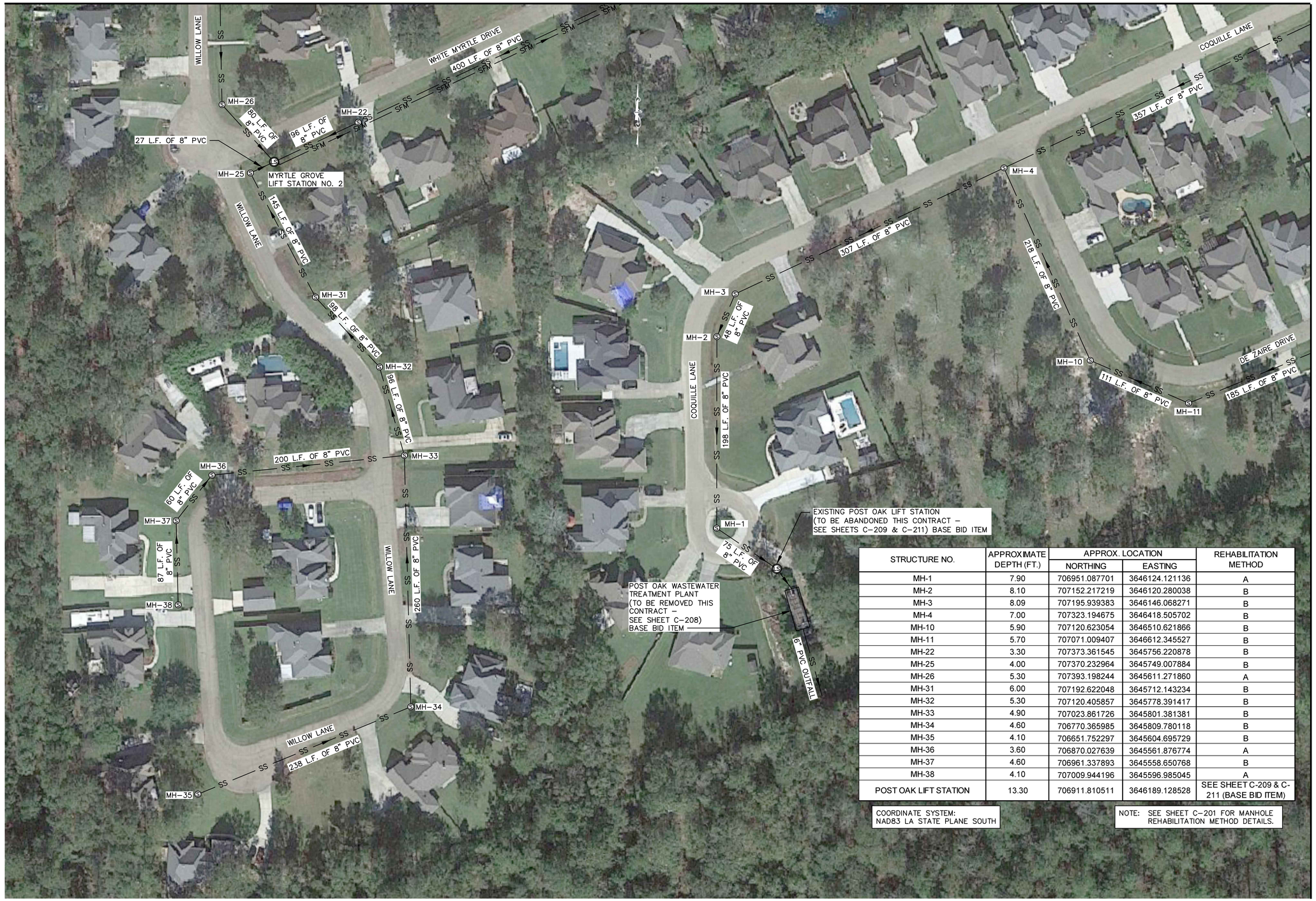
STATE OF LOUISIANA
DAVID A. COLSON
REG. NO. 28572
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

MANHOLE REHABILITATION - PLAN
(SHEET 4 OF 6)

SHEET NO.
C-205
SHEET 10 of 42

MATCH LINE SEE SHEET C-204



MATCH LINE SEE SHEET C-207

STRUCTURE NO.	APPROXIMATE DEPTH (FT.)	APPROX. LOCATION		REHABILITATION METHOD
		NORTHING	EASTING	
MH-1	7.90	706951.087701	3646124.121136	A
MH-2	8.10	707152.217219	3646120.280038	B
MH-3	8.09	707195.939383	3646146.068271	B
MH-4	7.00	707323.194675	3646418.505702	B
MH-10	5.90	707120.623054	3646510.621866	B
MH-11	5.70	707071.009407	3646612.345527	B
MH-22	3.30	707373.361545	3645756.220878	B
MH-25	4.00	707370.232964	3645749.007884	B
MH-26	5.30	707393.198244	3645611.271860	A
MH-31	6.00	707192.622048	3645712.143234	B
MH-32	5.30	707120.405857	3645778.391417	B
MH-33	4.90	707023.861726	3645801.381381	B
MH-34	4.60	706770.365985	3645809.780118	B
MH-35	4.10	706651.752297	3645604.695729	B
MH-36	3.60	706870.027639	3645561.876774	A
MH-37	4.60	706961.337893	3645558.650768	B
MH-38	4.10	707009.944196	3645596.985045	A
POST OAK LIFT STATION	13.30	706911.810511	3646189.128528	SEE SHEET C-209 & C-211 (BASE BID ITEM)

COORDINATE SYSTEM:
NAD83 LA STATE PLANE SOUTH

NOTE: SEE SHEET C-201 FOR MANHOLE REHABILITATION METHOD DETAILS.

ADDITIVE ALTERNATE NO. 1

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	TLB
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	1" = 50'

STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26372
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

MANHOLE REHABILITATION – PLAN
(SHEET 5 OF 6)

SHEET NO.
C-206
SHEET 11 of 42

G:\11707\06 ISSUED FOR BID REVISED\07-12_11707_C-202-207 SEWER REHAB PLANS.dwg [C-206(7)] Jun 18, 2024 - 3:11pm by gfjohnson

MATCH LINE SEE SHEET C-205

STRUCTURE NO.	APPROXIMATE DEPTH (FT.)	APPROX. LOCATION		REHABILITATION METHOD
		NORTHING	EASTING	
MH-5	6.10	707472.804708	3646739.116222	B
MH-12	5.60	707151.521952	3646781.416522	B
MH-13	5.60	707281.775297	3647064.426078	A
MH-14	4.40	707353.317684	3647290.862483	B
MH-15	5.60	707389.095976	3647337.186580	B

COORDINATE SYSTEM:
NAD83 LA STATE PLANE SOUTH

NOTE: SEE SHEET C-201 FOR MANHOLE REHABILITATION METHOD DETAILS.

MATCH LINE SEE SHEET C-206

ADDITIVE ALTERNATE NO. 1

G:\11707\06 ISSUED FOR BID REVISED\07-12_11707_C-202-207 SEWER REHAB PLANS.dwg [C-207(8)] Jun 18, 2024 - 3:11pm by gfjohnson

ST. TAMMANY PARISH GOVERNMENT

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

No.	DESCRIPTION OF REVISION	DATE:

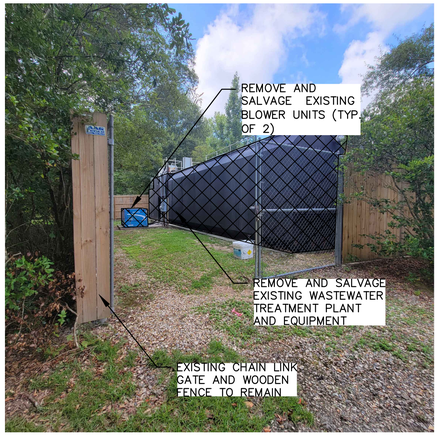
DESIGNED BY: DAC
DRAWN BY: TLB
CHECKED BY: TAA
SUBMITTED BY: DAC
PROJECT No.: TU23000171
TU23000175
ISSUE DATE: 05/2024
APPROVED BY: TAA
SHEET SIZE: ANSI D
SCALE: 1" = 50'

STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26372
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

MANHOLE REHABILITATION - PLAN
(SHEET 6 OF 6)

SHEET NO.
C-207
SHEET 12 of 42

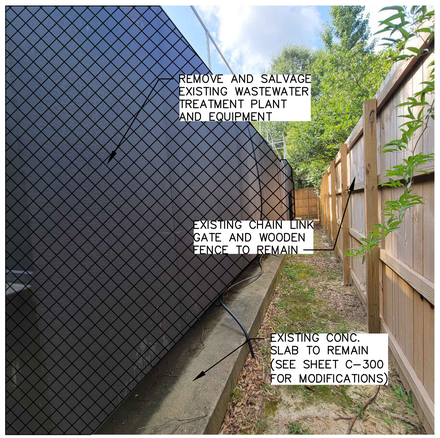


POST OAK WASTEWATER TREATMEN PLANT ENTRANCE GATE AND DEMOLITION/SALVAGE

POST OAK WASTEWATER TREATMENT PLANT AND INFLUENT PIPE DEMOLITION/SALVAGE

POST OAK WASTEWATER TREATMENT PLANT AND EFFLUENT PIPE AND BLOWERS DEMOLITION/SALVAGE

POST OAK WASTEWATER TREATMENT PLANT REAR VIEW DEMOLITION/SALVAGE



POST OAK WASTEWATER TREATMENT PLANT WEST VIEW DEMOLITION/SALVAGE

POST OAK WASTEWATER TREATMENT PLANT TOP VIEW DEMOLITION/SALVAGE

LEGEND:

EQUIPMENT TO BE REMOVED AND SALVAGED OR DISPOSED AS DIRECTED BY OWNER

GENERAL NOTES

1. CONTRACTOR SHALL EMPTY AND CLEAN THE EXISTING WASTEWATER TREATMENT PLANT UNITS AND REMOVE ALL DEBRIS, SOLIDS, SEMI-SOLIDS, ETC. RESULTING FROM THE CLEANING OPERATION. ALL WASTE MATERIAL SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT A LEGALLY PERMITTED SITE FOR THAT PURPOSE.
2. THE CONTRACTOR SHALL FOLLOW ALL CURRENT AND APPLICABLE LOCAL, STATE, AND FEDERAL RULES AND REGULATIONS REGARDING ABANDONING WASTEWATER TREATMENT PLANT AND THE APPROPRIATE DISPOSAL OF WASTE MATERIAL.
3. UNDER NO CIRCUMSTANCES SHALL CONTENTS REMOVED IN THE CLEANING PROCESS BE DUMPED INTO STREETS, WATERWAYS, DITCHES, CATCH BASINS, STORM DRAINS, SEWER MANHOLES, WET WELLS, OR CLEANOUTS.
4. SCOPE: CONTRACTOR SHALL REMOVE AND SALVAGE WWTP AND ALL EXISTING PUMPS, MOTORS, BASES, BLOWER EQUIPMENT, CONTROL PANELS, DISCONNECT SWITCHES, AND OTHER ELECTRICAL PANELS. ALL SALVAGED ITEMS SHALL BE DELIVERED TO THE WESTWOOD WWTP SITE AT 176 JUDGE TANNER BLVD. (30° 24' 22"N, -90° 04' 35"W)
5. CONTRACTOR SHALL OBTAIN RIGHT-OF-ENTRY TO ALL PROPERTY AND/OR SERVITUDES IF RIGHT-OF-ENTRY IS NOT ALREADY GRANTED BY OWNER AS NEEDED FOR THE WORK.
6. THE EXISTING WOOD FENCE, CHAIN LINK GATE, AND WASTEWATER TREATMENT PLANT SLAB FOUNDATIONS ARE TO REMAIN FOR REUSE (SEE SHEET C-300). DAMAGE TO ITEMS DESIGNATED TO REMAIN SHALL BE REPAIRED BY CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
7. THE POST OAK WASTEWATER TREATMENT PLANT SHALL BE DE-ENERGIZED AND REMOVED/SALVAGED ONLY AFTER TEMPORARY BY-PASS PUMPING AT THE EXISTING POST OAK LIFT STATION IS SUCCESSFULLY OPERATING AND AUTHORIZED BY THE DEPARTMENT OF UTILITIES.
8. SEE SHEET NO. C-209 FOR DEMOLITION OF WWTP INFLUENT LIFT STATION.
9. SEE SHEET NO. C-300 FOR SUGGESTED SEQUENCE OF CONSTRUCTION AT THIS LOCATION.

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

No.	DESCRIPTION OF REVISION	DATE:

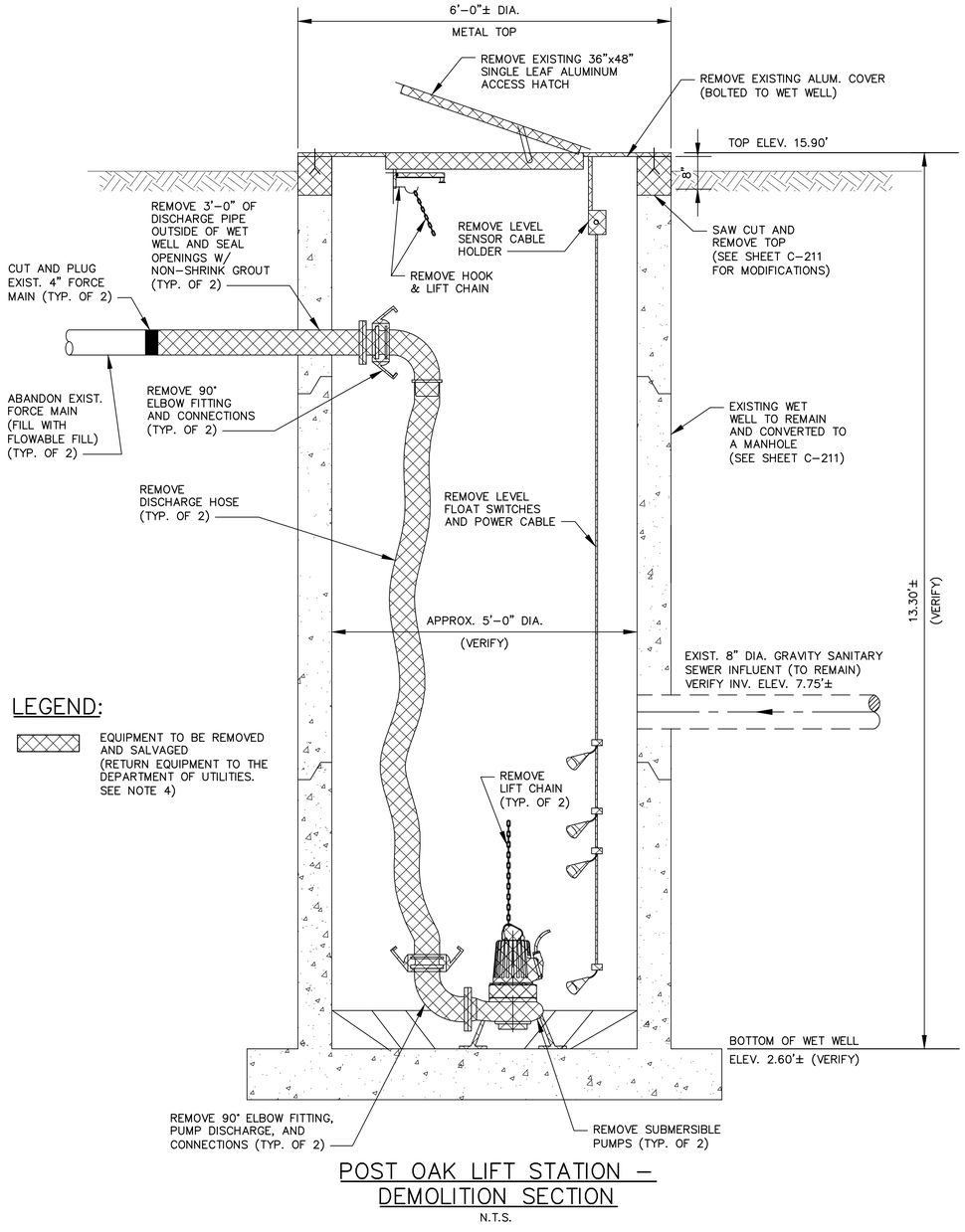
DESIGNED BY:	DAC
DRAWN BY:	GFJ
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	N.T.S.

STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 28372
PROFESSIONAL ENGINEER IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171 & TU23000175

POST OAK WASTEWATER TREATMENT PLANT DEMOLITION - PHOTOGRAPHS

SHEET NO.
C-208
SHEET 13 of 42

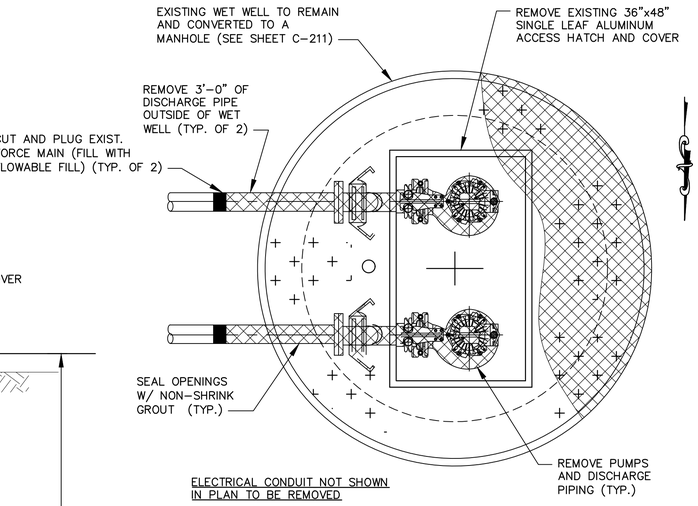


LEGEND:

EQUIPMENT TO BE REMOVED AND SALVAGED (RETURN EQUIPMENT TO THE DEPARTMENT OF UTILITIES. SEE NOTE 4)

POST OAK LIFT STATION – DEMOLITION SECTION

N.T.S.



ELECTRICAL CONDUIT NOT SHOWN IN PLAN TO BE REMOVED

POST OAK LIFT STATION – DEMOLITION PLAN

N.T.S.

LEGEND:

EQUIPMENT TO BE REMOVED AND SALVAGED OR DISPOSED AS DIRECTED BY OWNER

GENERAL NOTES:

1. PIPING MAY BE SHOWN ROTATED FOR CLARITY.
2. SEE SHEET NO. C-211 FOR MODIFICATIONS TO EXISTING WET WELL.
3. SEE ELECTRICAL DRAWINGS FOR DEMOLITION/SALVAGE OF ELECTRICAL EQUIPMENT.
4. ALL SALVAGED ITEMS SHALL BE DELIVERED TO THE DEPARTMENT OF UTILITIES AT 620 N. TYLER STREET, COVINGTON, LA 70433.
5. THE CONTRACTOR WILL BE ALLOWED TO UTILIZE THE EXISTING POST OAK LIFT STATION WET WELL FOR BY-PASS PUMPING DURING DEMOLITION/SALVAGE WORK AT THE EXISTING POST OAK WASTEWATER TREATMENT PLANT. COORDINATE ALL BY-PASS PUMPING WITH THE DEPARTMENT OF UTILITIES. BY-PASS PUMPING EQUIPMENT SHALL BE CAPABLE OF PUMPING PEAK FLOW TO THE EXISTING FAUBOURG LIFT STATION. SEE SHEET NO. C-300 FOR SUGGESTED SEQUENCE OF CONSTRUCTION AT THIS LOCATION.

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	GFJ
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	N.T.S.

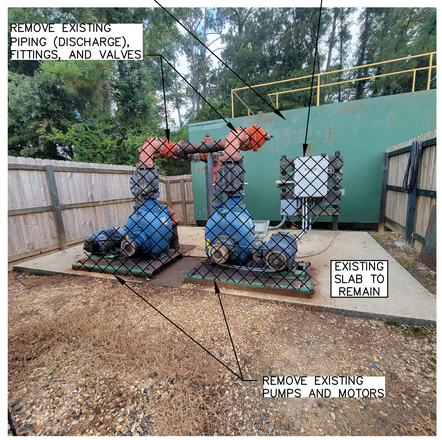
STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26372
FLOOD CERTIFIED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171 & TU23000175

POST OAK LIFT STATION – DEMOLITION PLAN, SECTION AND PHOTOGRAPHS

SHEET NO.
C-209
SHEET 14 of 42

FAUBOURG LIFT STATION NO. 2
DEMOLITION/SALVAGE



FAUBOURG LIFT STATION NO. 2
DEMOLITION/SALVAGE
INTERIOR FRONT

FAUBOURG LIFT STATION NO. 2
DEMOLITION/SALVAGE
INTERIOR REAR

LEGEND:

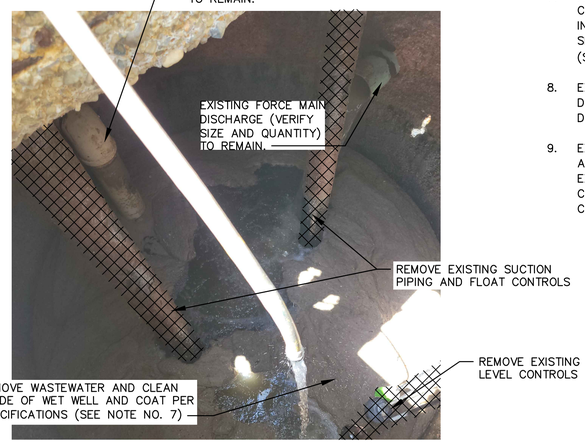
EQUIPMENT TO BE REMOVED AND SALVAGED OR DISPOSED

GENERAL NOTES:

1. CONTRACTOR SHALL EMPTY AND CLEAN THE WASTEWATER LIFT STATION WET WELL AND REMOVE ALL DEBRIS, SOLIDS, SEMI-SOLIDS, ETC. RESULTING FROM THE CLEANING OPERATION. ALL WASTE MATERIAL SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT A LEGALLY PERMITTED SITE FOR THAT PURPOSE.
2. THE CONTRACTOR SHALL FOLLOW ALL CURRENT APPLICABLE LOCAL, STATE, AND FEDERAL RULES AND REGULATIONS REGARDING CLEANING WASTEWATER LIFT STATION AND THE APPROPRIATE DISPOSAL OF WASTE MATERIAL.
3. UNDER NO CIRCUMSTANCES SHALL CONTENT REMOVED IN THE CLEANING PROCESS BE DUMPED INTO STREETS, WATERWAYS, DITCHES, CATCH BASINS, STORM DRAINS, SEWER MANHOLES, WET WELLS, OR CLEANOUTS.
4. SCOPE: CONTRACTOR SHALL REMOVE AND SALVAGE ALL EXISTING PUMPS, MOTORS, PIPING, VALVES, FITTINGS, BLOWER EQUIPMENT, CONTROL PANELS, DISCONNECT SWITCHES, AND OTHER ELECTRICAL PANELS. ALL SALVAGED ITEMS SHALL BE DELIVERED TO THE DEPARTMENT OF UTILITIES AT 620 N. TYLER STREET, COVINGTON, LA 70433.
5. CONTRACTOR SHALL OBTAIN RIGHT-OF-ENTRY TO ALL PROPERTY AND/OR SERVITUDES IF RIGHT-OF-ENTRY IS NOT ALREADY GRANTED BY OWNER AS NEEDED FOR THE WORK.
6. THE CONTRACTOR WILL BE ALLOWED TO UTILIZE THE EXISTING FAUBOURG LIFT STATION NO. 2 WET WELL FOR BY-PASS PUMPING DURING CONSTRUCTION. COORDINATE ALL BY-PASS PUMPING WITH THE DEPARTMENT OF UTILITIES. NO DIRECT PAY ITEM.
7. AFTER CLEANING INSIDE OF WET WELL, COMPLETELY SEAL AND COAT INTERIOR BOTTOM, INTERIOR WALL, AND INTERIOR TOP PER SPECIFICATIONS FOR WET WELL REHABILITATION (SEE SHEET C-211).
8. EXISTING WET WELL APPROXIMATELY 10 FT. DIAMETER BY APPROXIMATELY 13 FT.-10 INCHES DEEP. CONTRACTOR TO VERIFY EXACT DIMENSIONS.
9. EXISTING WASTEWATER TREATMENT PLANT WILL BE ABANDONED AND REMOVED BY OTHERS PRIOR TO EXECUTION OF THIS CONTRACT. AREA WILL BE CLEARED AND REGRADED PRIOR TO THIS CONTRACT.

FAUBOURG LIFT STATION NO. 2
DEMOLITION/SALVAGE
PUMPS AND DISCHARGE PIPING/VALVES

FAUBOURG LIFT STATION NO. 2
DEMOLITION/SALVAGE
ELECTRICAL PANEL



FAUBOURG LIFT STATION NO. 2
DEMOLITION/SALVAGE
WET WELL PIPING

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	GFJ
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	N.T.S.

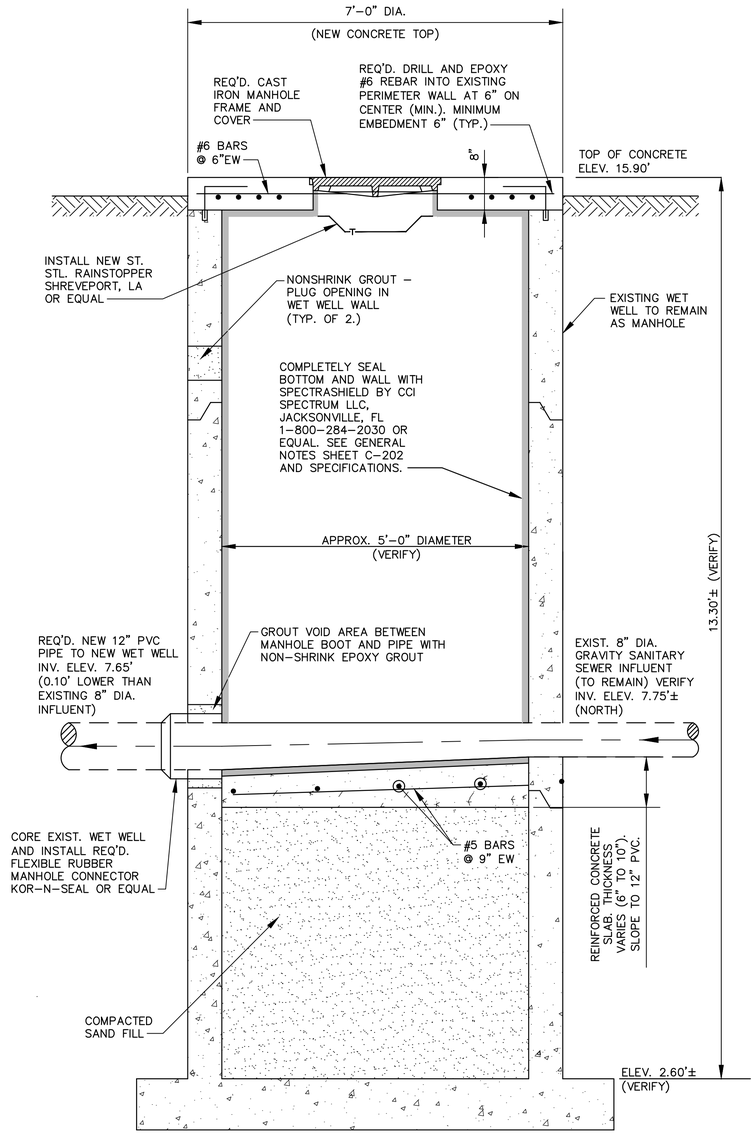
STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26372
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION NO. 2 IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171 & TU23000175

FAUBOURG LIFT STATION NO. 2 - DEMOLITION PHOTOGRAPHS

SHEET NO.
C-210
SHEET 15 of 42

G:\11707\06 ISSUED FOR BID REVISED\15_11707_C-210_FAUBOURG PUMP STATION DEMO PHOTOS.dwg [C-210] Jun 18, 2024 - 3:20pm by gfjohnson

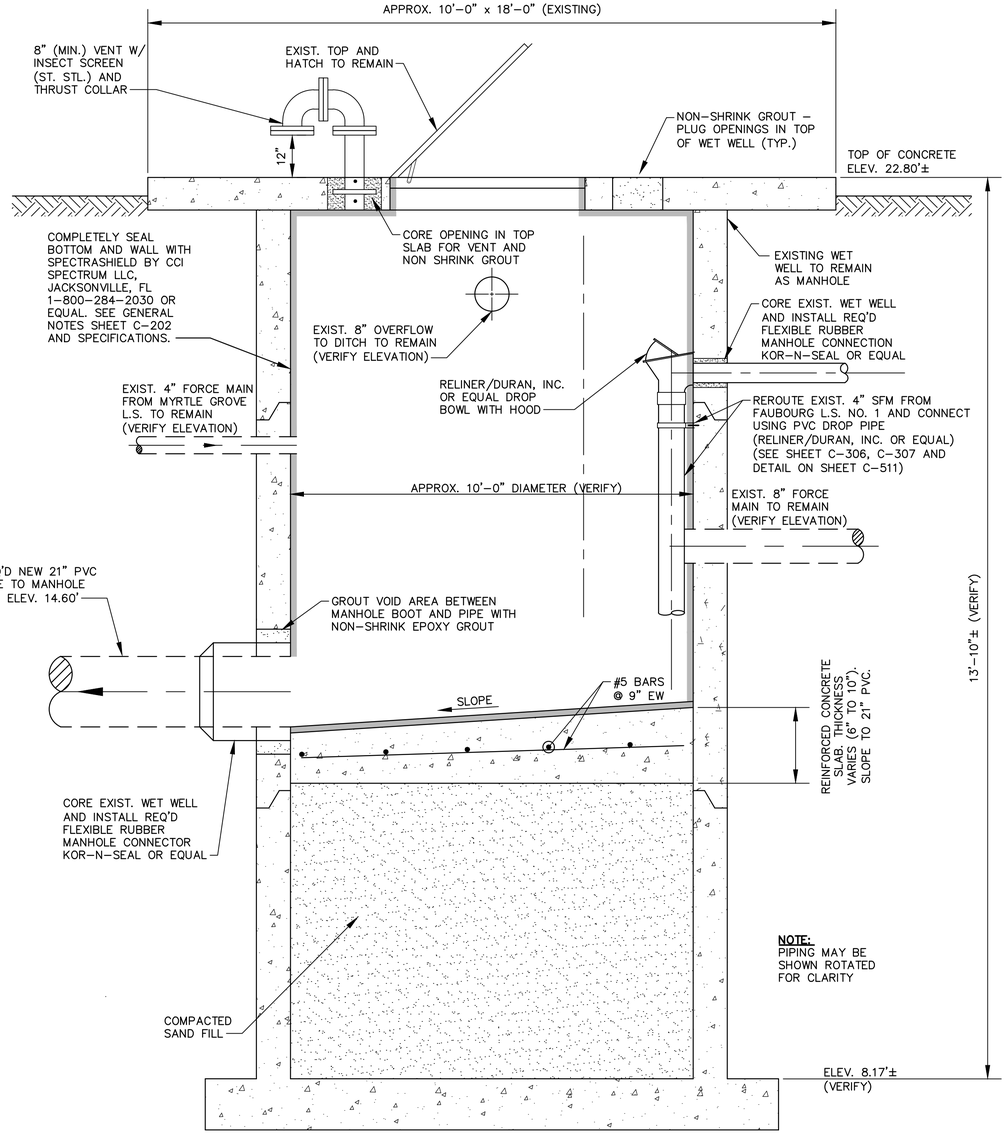


MODIFICATIONS TO POST OAK LIFT STATION – SECTION

N.T.S

NOTE:
SEE GENERAL NOTES SHEET C–201

NOTE:
SHAPE BENCH TO PIPE SPRING LINE. SLOPE CHANNEL TO 12" PIPE. SEE MANHOLE DETAIL.



MODIFICATIONS TO FAUBOURG LIFT STATION NO.2 – SECTION

N.T.S

NOTE:
SEE GENERAL NOTES SHEET C–201

NOTE:
SHAPE BENCH TO PIPE SPRING LINE.

SLOPE CHANNEL TO 21" PIPE. SEE MANHOLE DETAIL

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	GFJ
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	N.T.S.

STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26372
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

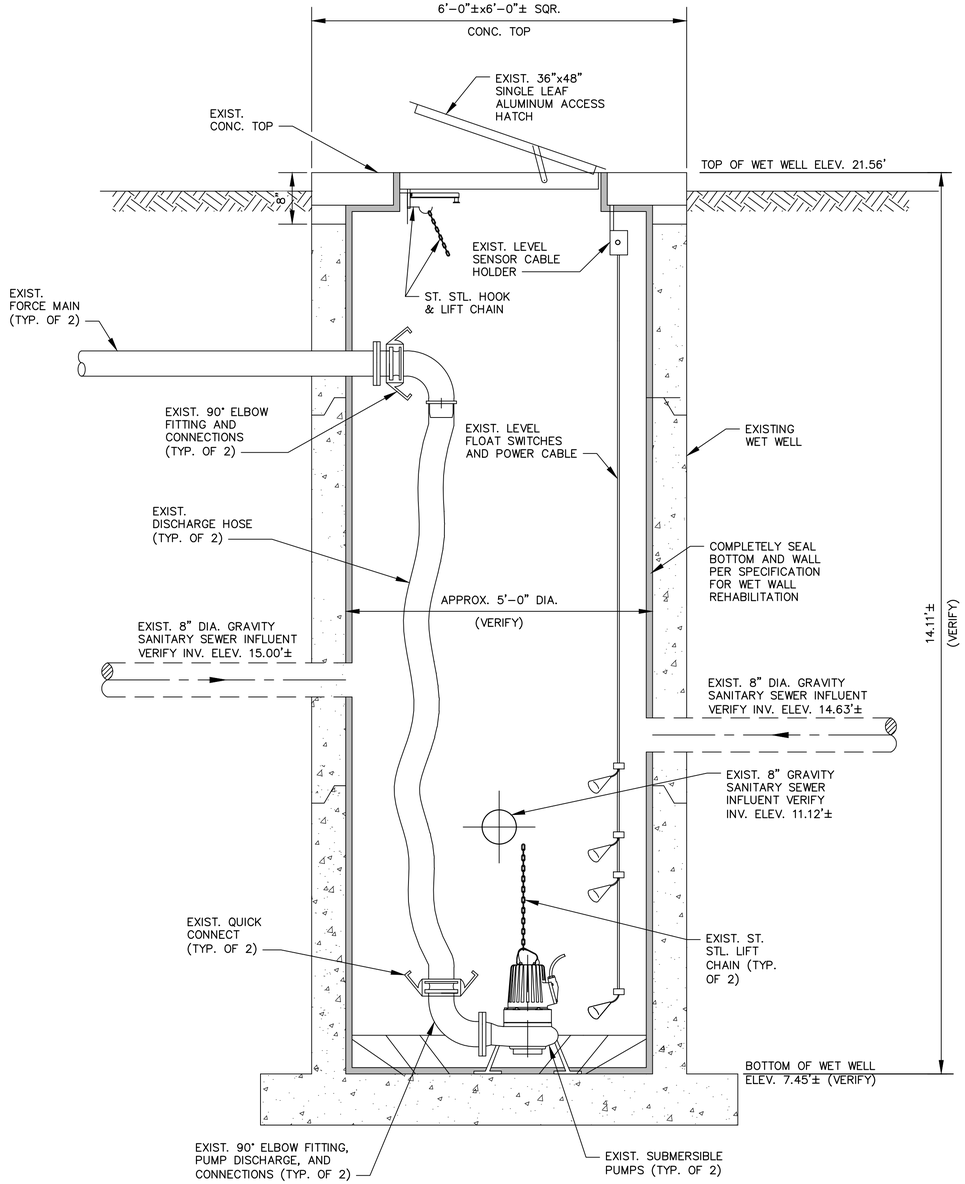
POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

POST OAK LIFT STATION AND FAUBOURG LIFT STATION NO. 2 MODIFICATIONS – SECTIONS

SHEET NO.
C–211
SHEET 16 of 42

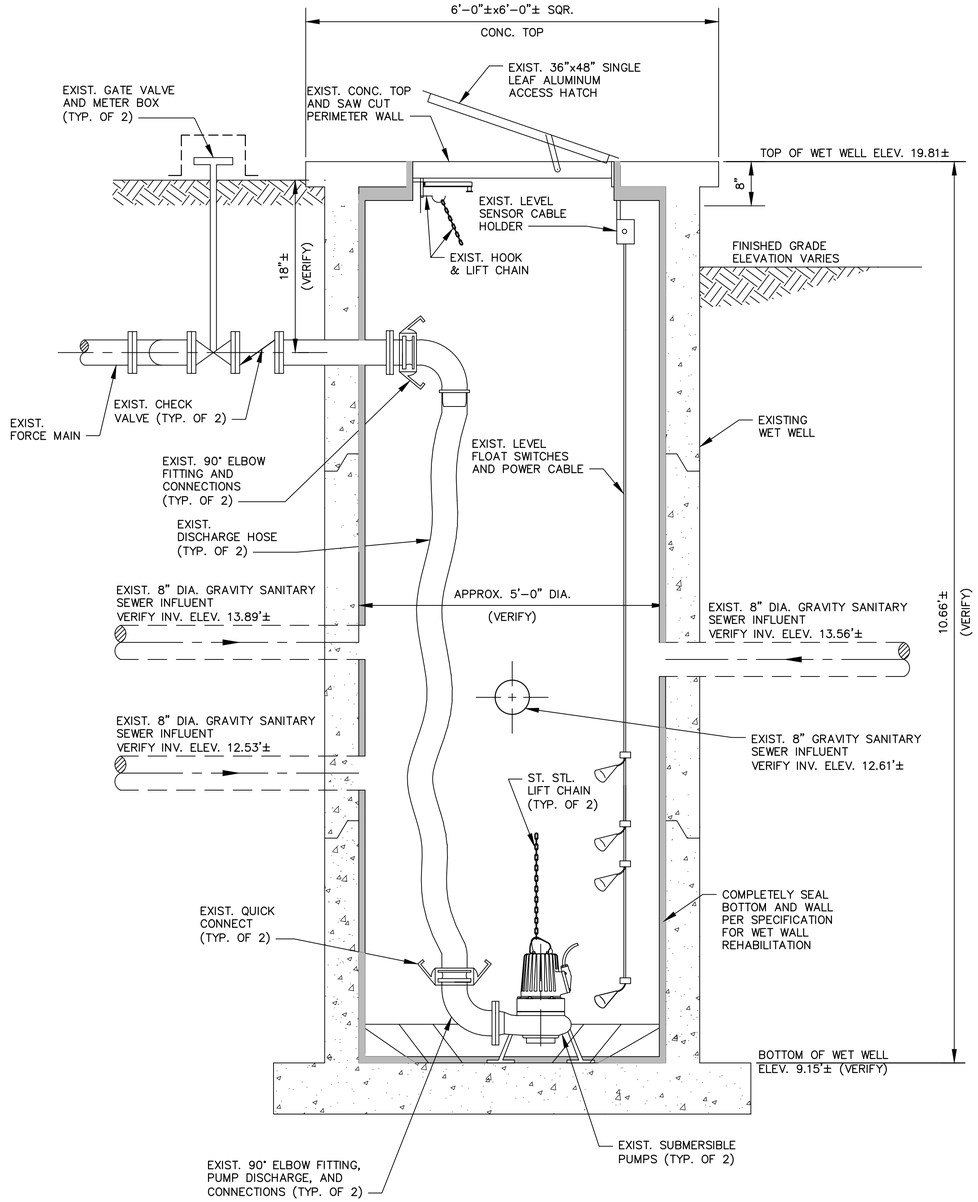
G:\11707\06 ISSUED FOR BID REVISED\16_11707_C–211_LIFT STATIONS MODIFICATIONS–PLANS AND SECTIONS.dwg [C–211] Jun 18, 2024 – 3:20pm by gfjohnson

NOTE:
SEE GENERAL
NOTES SHEET
C-201



FAUBOURG LIFT STATION NO. 1
REHABILITATION – SECTION
N.T.S.

NOTE:
SEE GENERAL
NOTES SHEET
C-201



MYRTLE GROVE LIFT STATION
REHABILITATION – SECTION
N.T.S.

ST. TAMMANY PARISH GOVERNMENT

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	GFJ
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	N.T.S.

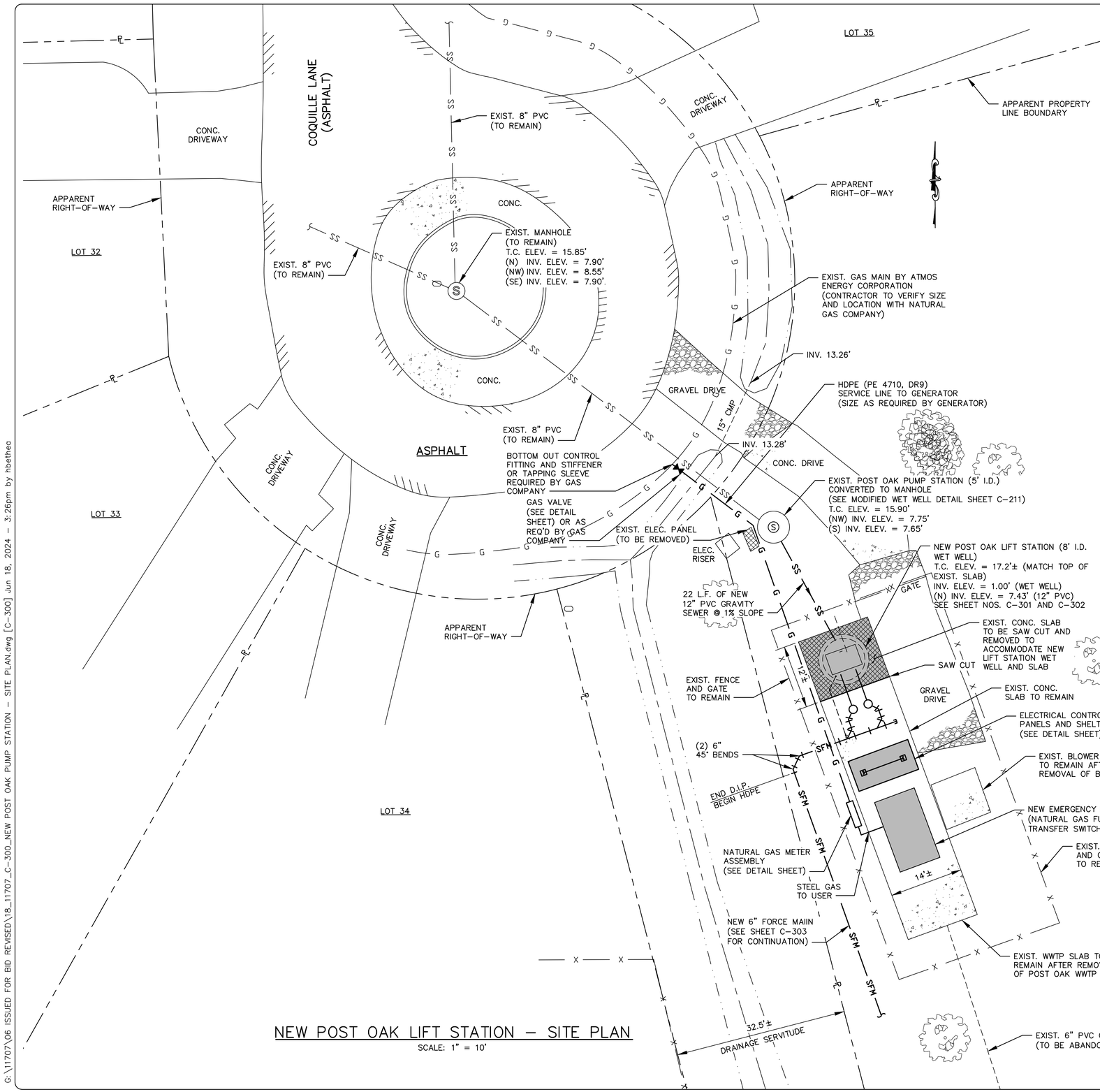
STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26372
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

FAUBOURG LIFT STATION NO. 1 AND MYRTLE GROVE LIFT STATION REHABILITATION

SHEET NO.
C-212
SHEET 17 of 42

G:\11707\06 ISSUED FOR BID REVISED\17_11707_C-212_FAUBOURG LIFT STATION NO 1 & MYRTLE GROVE REHAB.dwg [C-212] Jun 18, 2024 - 3:21pm by gfjohnson



NEW POST OAK LIFT STATION – SITE PLAN

SCALE: 1" = 10'

GENERAL NOTES:

1. CONTACT THE DEPARTMENT OF UTILITIES AND ARRANGE AN ON-SITE PRE-CONSTRUCTION MEETING AT LEAST 48-HOURS PRIOR TO COMMENCEMENT OF THE WORK.
2. VERIFY ALL EXISTING ELEVATIONS, EXACT LOCATIONS, AND DIMENSIONS SHOWN ON THE PLANS.
3. COORDINATE WITH THE POST OAK SUBDIVISION HOMEOWNER'S ASSOCIATION ON THE REMOVAL OF VEGETATION. STAKE AND/OR FLAG THE LIMITS OF CLEARING ON THE SITE.
4. CLEARING AND GRUBBING, AS NECESSARY, FOR INSTALLATION OF PERIMETER CONTROLS.
5. INSTALL AND MAINTAIN TEMPORARY DRAINAGE AND EROSION CONTROL MEASURES DURING EXCAVATION AND EMBANKMENT ACTIVITIES.
6. CONSTRUCT THE NEW FORCE MAIN TO LA HWY. 1077 AND MAKE THE REQUIRED CONNECTION TO THE EXISTING FORCE MAIN ALONG LA HWY. 1077. THE CONTRACTOR IS ALLOWED A MAXIMUM OF 4 HOURS TO MAKE THE TIE-IN AT LA HWY 1077 WITH THE CONNECTED LIFT STATIONS SHUT OFF.
7. INSTALL A TEMPORARY PUMPING CONNECTION ON THE NEW FORCE MAIN.
8. COORDINATE THE REQUIRED NEW ELECTRICAL SERVICE ENTRANCE WITH THE ELECTRICAL UTILITY.
9. INSTALL TEMPORARY BYPASS PUMPING AT THE MANHOLE UPSTREAM OF/OR AT THE EXISTING WET WELL AND PUMP TO NEW FORCE MAIN. TEMPORARY BYPASS PUMPS SHALL BE CAPABLE OF PUMPING 180 GPM AT 51 FEET TDH WITH SOUND ATTENUATION DEVICES (250 dB) OR LESS.
10. COORDINATE REMOVAL AND SALVAGE OF ALL STRUCTURES, PIPING, EQUIPMENT, AND APPURTENANCES WITH THE DEPARTMENT OF UTILITIES.
11. DE-ENERGIZE THE EXISTING LIFT STATION AND WWTP AND COMPLETE REMOVAL AND SALVAGE OF ALL STRUCTURES, PIPING, EQUIPMENT, AND APPURTENANCES AS SHOWN ON THE DRAWINGS.
12. EXISTING WET WELL AND WWTP SHALL BE FREE OF WASTEWATER AND SLUDGE. ALL WASTEWATER AND SLUDGE SHALL BE LEGALLY DISPOSED OF BY THE CONTRACTOR.
13. MODIFY THE EXISTING WET WELL AND WWTP SLAB AS SHOWN ON THE DRAWINGS.
14. INSTALL THE REQUIRED NEW GRAVITY SEWER, NEW WET WELL, PUMPS, PIPING, VALVES, FITTINGS, CONTROLS, ELECTRICAL EQUIPMENT, AND APPURTENANCES FOR A COMPLETE OPERATING SYSTEM.
15. CONNECT NEW PUMP STATION DISCHARGE PIPING TO THE NEW FORCE MAIN TO LA HWY 1077.
16. PRIOR TO THE ACCEPTANCE BY THE DEPARTMENT OF UTILITIES, AN OPERATIONAL TEST OF ALL PUMPS AND CONTROL SYSTEM SHALL BE CONDUCTED TO DETERMINE IF THE INSTALLED EQUIPMENT MEETS THE PURPOSE AND INTENT OF THE SPECIFICATIONS. TESTS SHALL DEMONSTRATE THAT ALL EQUIPMENT IS ELECTRICALLY, MECHANICALLY, STRUCTURALLY, AND OTHERWISE ACCEPTABLE; IT IS SAFE AND IN OPTIMUM WORKING CONDITION; AND CONFORMS TO THE SPECIFIED OPERATING CHARACTERISTICS.
17. A START-UP REPORT SHALL BE SUBMITTED BY THE PUMP STATION FACTORY REPRESENTATIVE, PROVIDING DOCUMENTATION OF STATION GAUGE READINGS, MOTOR AMPERAGE, LEVEL SETTINGS, AS WELL AS A COMPLETE CHECK LIST OF STATION COMPONENTS TO ASSURE THAT THE COMPLETE PUMP STATION IS IN GOOD WORKING ORDER. COPIES SHALL BE PROVIDED FOR THE ENGINEER, INSTALLING CONTRACTOR, OWNER AND STATION MANUFACTURERS SERVICE DEPARTMENT TO ASSURE WARRANTY CONSIDERATION.
18. CLEAN UP SITE AND FERTILIZE/SEED AREAS WHERE EXISTING VEGETATION WAS REMOVED OR DISTURBED.
19. SUBMIT RECORD AS-BUILT DRAWINGS TO THE ENGINEER AND DEPARTMENT OF UTILITIES.
20. CONTRACTOR SHALL RESTORE FENCE AND GATE TO PRECONSTRUCTION CONDITION OR BETTER UPON COMPLETION OF THE WORK.

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

No.	DESCRIPTION OF REVISION	DATE:

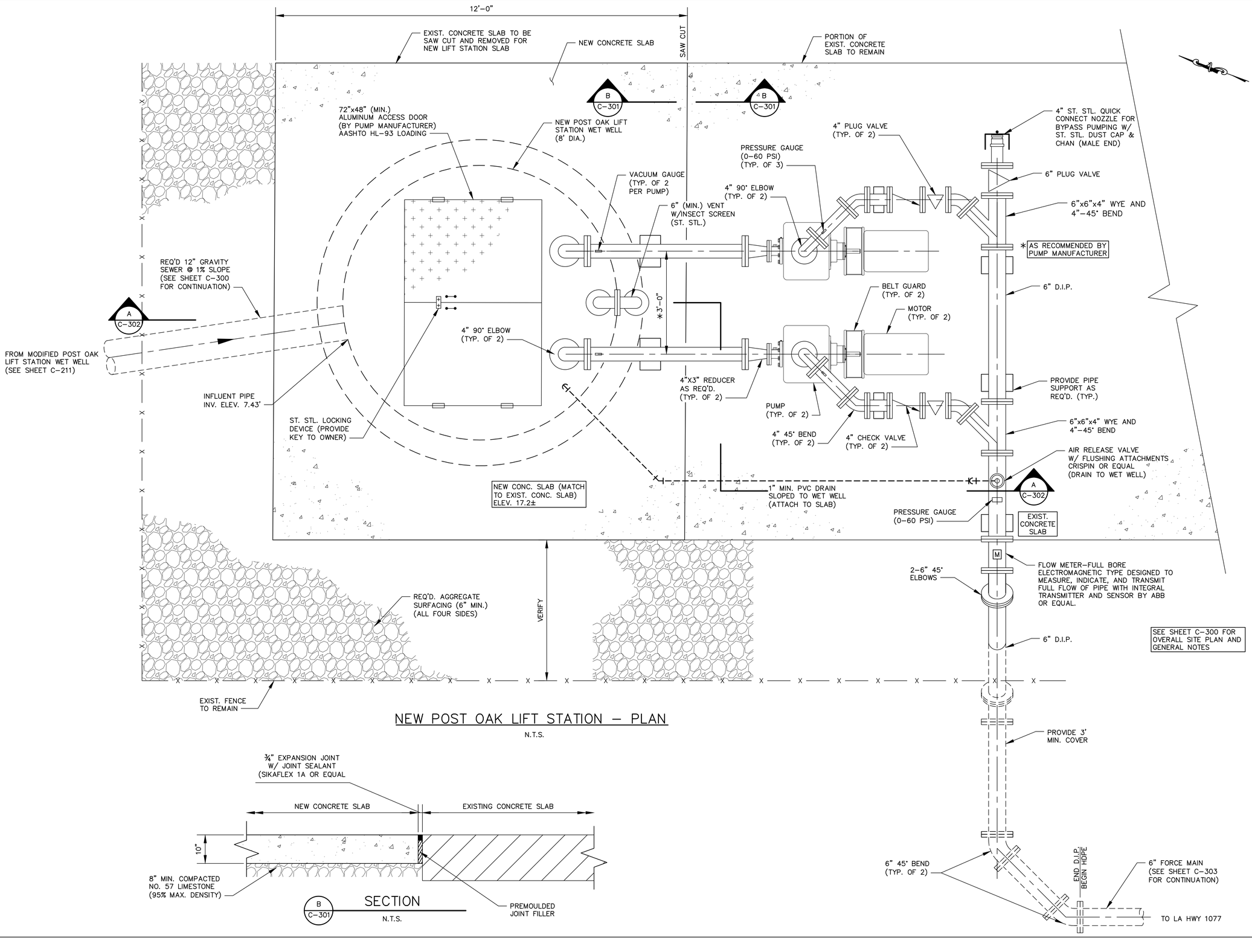
DESIGNED BY:	DAC
DRAWN BY:	GFJ
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	1" = 10'

STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26372
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

NEW POST OAK LIFT STATION – SITE PLAN

SHEET NO.
C-300
SHEET 18 of 42



NEW POST OAK LIFT STATION - PLAN

N.T.S.

SECTION

N.T.S.

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	GFJ
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	N.T.S.

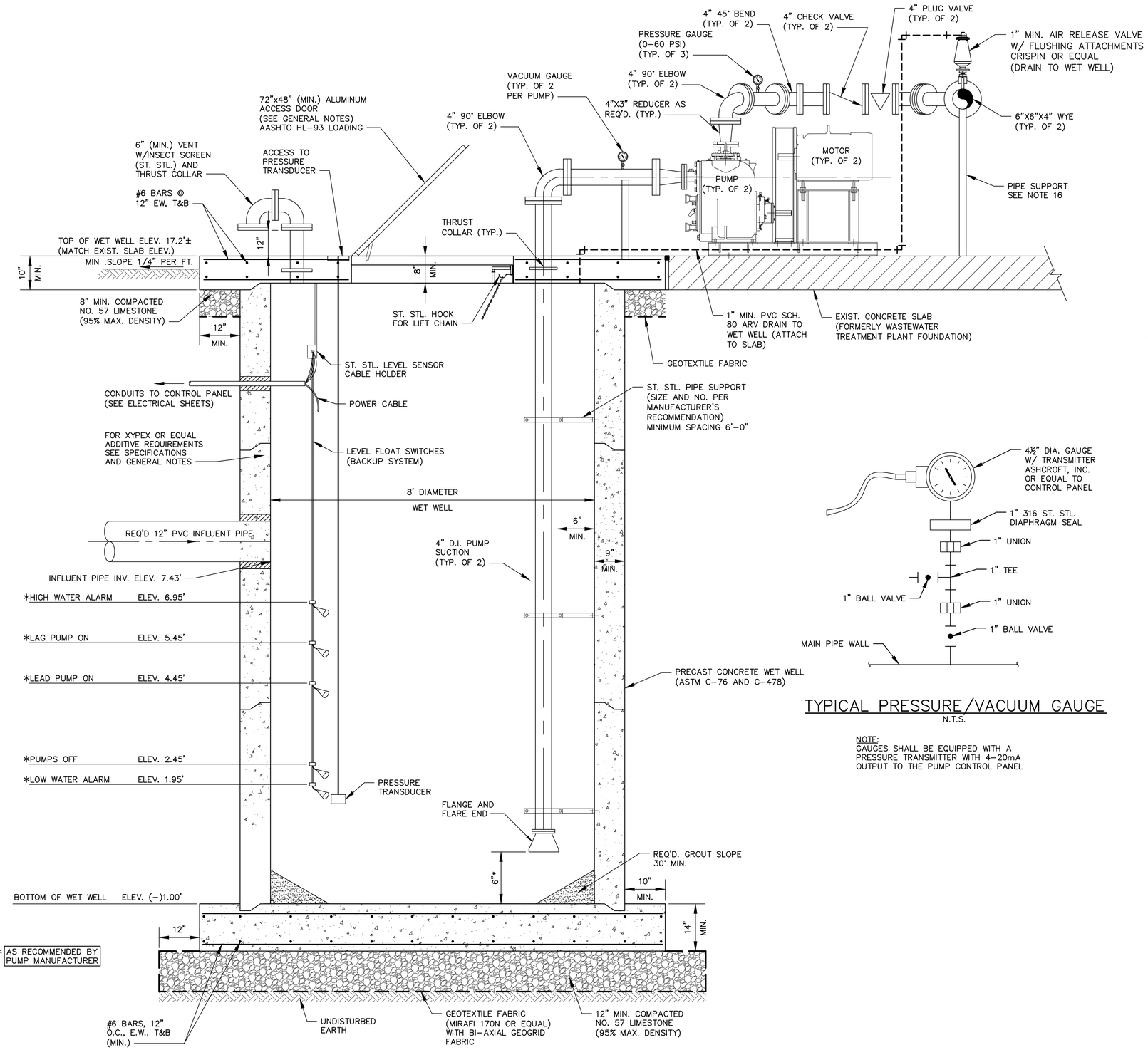
STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 28372
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171 & TU23000175

NEW POST OAK LIFT STATION - PLAN

SHEET NO.
C-301
SHEET 19 of 42

G:\11707\06 ISSUED FOR BID REVISED\19-20_11707_C-301-302_NEW POST OAK PUMP STATION-PLAN & SECTION.dwg [C-301] Jun 18, 2024 - 3:24pm by hbethea



A C–301

NEW POST OAK LIFT STATION– SECTION

N.T.S.

TYPICAL PRESSURE/VACUUM GAUGE

N.T.S.

NOTE:
GAUGES SHALL BE EQUIPPED WITH A PRESSURE TRANSMITTER WITH 4–20mA OUTPUT TO THE PUMP CONTROL PANEL

PUMP SELECTION CRITERIA

CONFIGURATION	DUPLEX SELF PRIMING
DUTY POINT	180 GPM AT 51 FT. TDH
MIN. EFFICIENCY AT DUTY POINT	40%
DRIVE	CONSTANT SPEED
SUCTION/DISCHARGE SIZE	3"/3"
PUMP SPEED	1770 RPM
MIN, SPHERICAL SOLIDS SIZE	3"
MOTOR SIZE	10 HP

NOTE: PUMPS SHALL CONFORM TO SPECIFICATION, AND SHALL BE IDENTICAL.

GENERAL NOTES: (APPLIES TO SHEET NOS. C–300, C–301 & C–302)

1. PIPING MAY BE SHOWN ROTATED FOR CLARITY.
2. WET WELL INTERIOR AND ALL EXPOSED D.I. PIPING AND VALVES SHALL BE COATED IN ACCORDANCE WITH THE SPECIFICATIONS.
3. ALL REINFORCING SHALL BE ASTM 615 GRADE 60, #6 BARS @ 12" CENTER TO CENTER, EACH WAY, TOP AND BOTTOM AS SHOWN. PROVIDE ADDITIONAL BARS AROUND OPENING.
4. ALL FASTENERS IN WET WELL SHALL BE 316 STAINLESS STEEL.
5. ALUMINUM HATCH SHALL BE BILCO MODEL JD–3ALH OR EQUAL WITH TYPE 316 STAINLESS STEEL HARDWARE, LOCKING HARDWARE, AND FALL PROTECTION. ALUMINUM IN CONTACT WITH CONCRETE SHALL BE PROTECTED WITH BITUMINOUS PROTECTIVE COATING. HATCH FRAME SHALL BE INTEGRALLY CAST WITH TOP COVER.
6. ALUMINUM HATCH SHALL BE 72"x48" (MIN.) AND LOCATED TO PROVIDED ACCESS TO PUMPS. RATED FOR HL–93 WHEEL LOAD.
7. CONTROL PANEL AND ELECTRICAL NOT SHOWN. REFER TO ELECTRICAL DRAWINGS.
8. REFER TO SHEET C–300 FOR SITE PLAN.
9. REFER TO SPECIFICATIONS FOR PUMPS AND CONTROLS.
10. ALL ABOVE GROUND DUCTILE IRON PIPE TO BE FLANGED JOINT AND BELOW GROUND DUCTILE IRON PIPE TO BE MECHANICAL JOINT.
11. CONTRACTOR SHALL PROVIDE BYPASS PUMPING AS REQUIRED AT ALL TIMES TO MAINTAIN FLOW. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL BYPASS PUMPING OPERATIONS AND SHALL CHECK/MAINTAIN BYPASS PUMPS SUCH THAT NO SEWER BACKUP OCCURS.
12. PAINT ABOVE GROUND EQUIPMENT, PIPING, FITTINGS, VALVES, PUMPS, PIPE SUPPORTS, ETC. PER SPECIFICATIONS USING COATING BY TNEMEC COMPANY INC. OR EQUAL.
13. ALL CRITICAL ELECTRICAL AND CONTROL EQUIPMENT SHALL BE LOCATED A MINIMUM OF 1 FT. ABOVE 100–YEAR BASE FLOOD ELEVATION.
14. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF EACH STRUCTURE AND FOR ALL EQUIPMENT DETAILING DIMENSIONS, PIPES/VALVES, CLEARANCES, SIZES, PIPE SUPPORTS AND ANY OTHER NECESSARY DETAILS.
15. CONNECTION TO THE NEW FORCE MAIN SHALL BE WITH RESTRAINED DUCTILE IRON MECHANICAL JOINT.
16. CONTRACTOR TO PROVIDE PIPE SUPPORTS AT SUCTION AND DISCHARGE PIPING AS REQUIRED.

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

No.	DESCRIPTION OF REVISION	DATE:

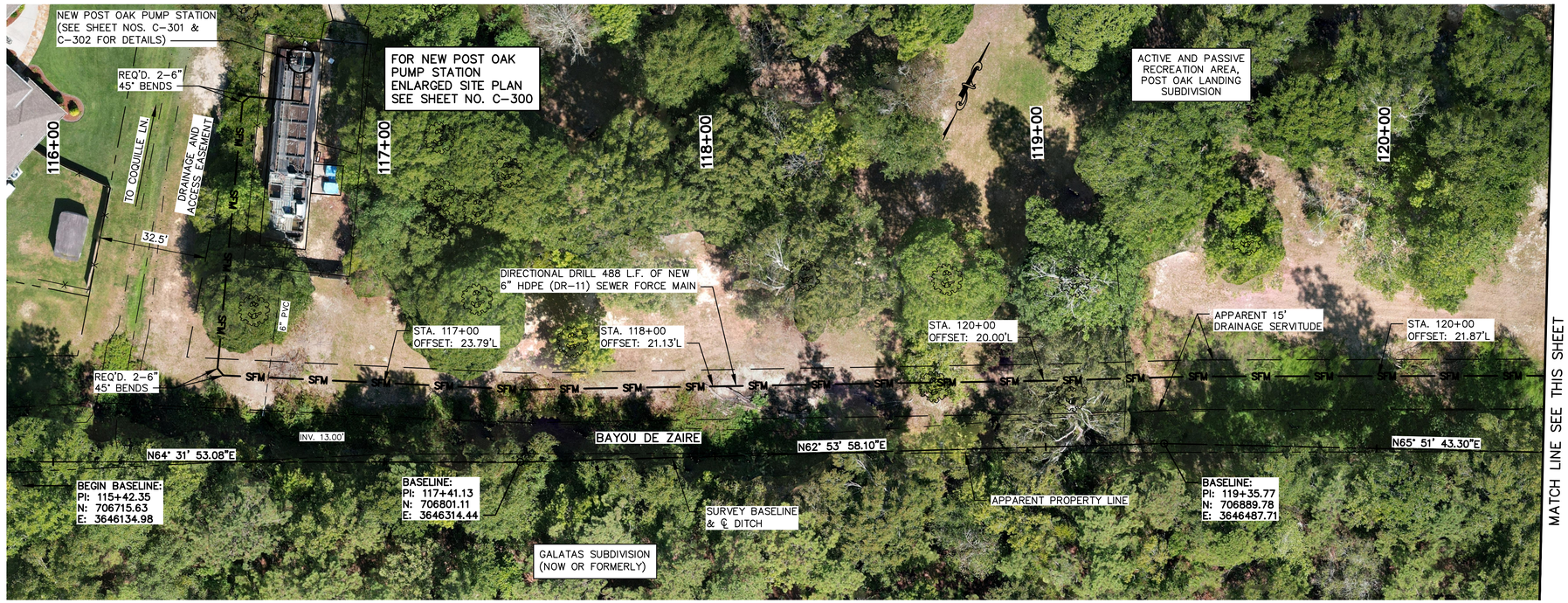
DESIGNED BY:	DAC
DRAWN BY:	GFJ
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	N.T.S.

STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26372
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

NEW POST OAK LIFT STATION – SECTION

SHEET NO.
C–302
SHEET 20 of 42



GENERAL NOTES:

1. SURVEY BASELINE AND SERVITUDE INFORMATION SHOWN OBTAINED FROM "BREWSTER ROAD/LA 1077 DRAINAGE IMPROVEMENTS – PHASE I" BY NY ASSOCIATES, INC., PROJECT NO. EN 190000092.
2. CONTRACTOR SHALL FIELD VERIFY LOCATION OF EXISTING SEWER FORCE MAIN.
3. SEE DETAIL SHEET FOR AIR RELEASE VALVE. EXACT LOCATION TO BE DETERMINED IN THE FIELD.

ST. TAMMANY PARISH GOVERNMENT

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	TLB
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	1" = 20'

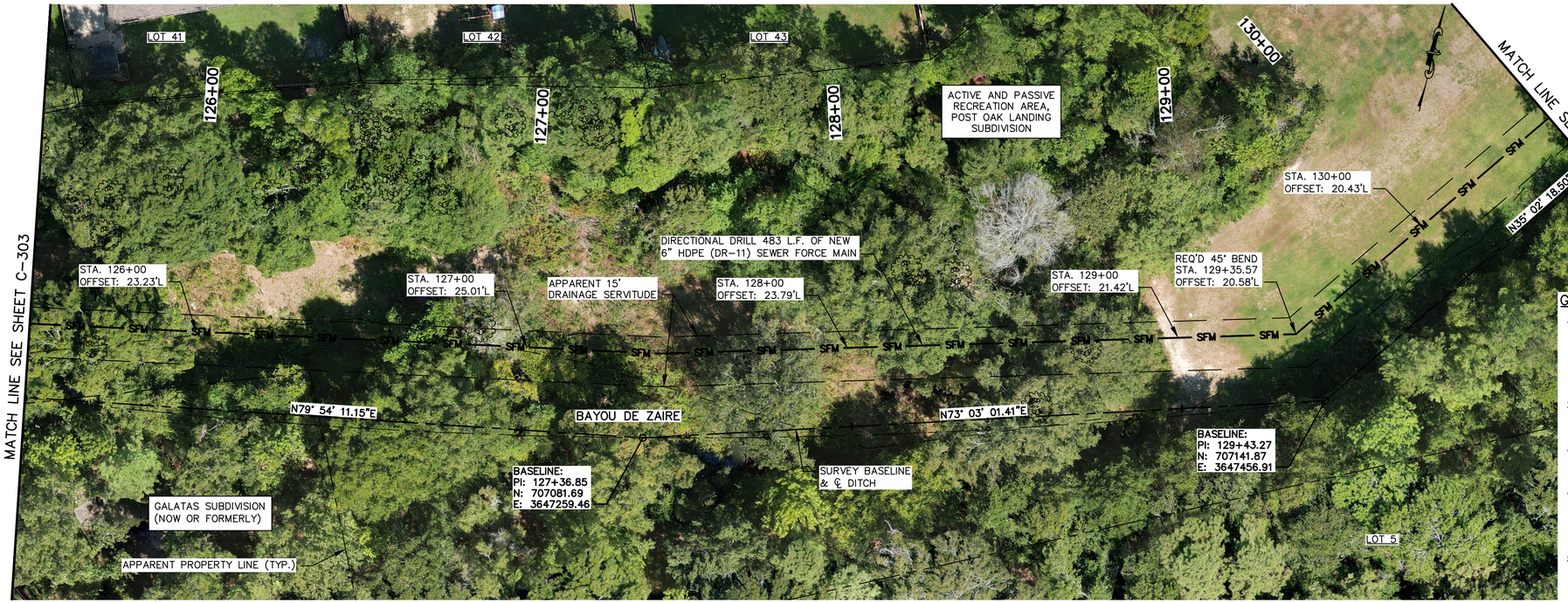
STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 28372
PROFESSIONAL ENGINEER IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

NEW POST OAK LIFT STATION FORCE MAIN – PLANS

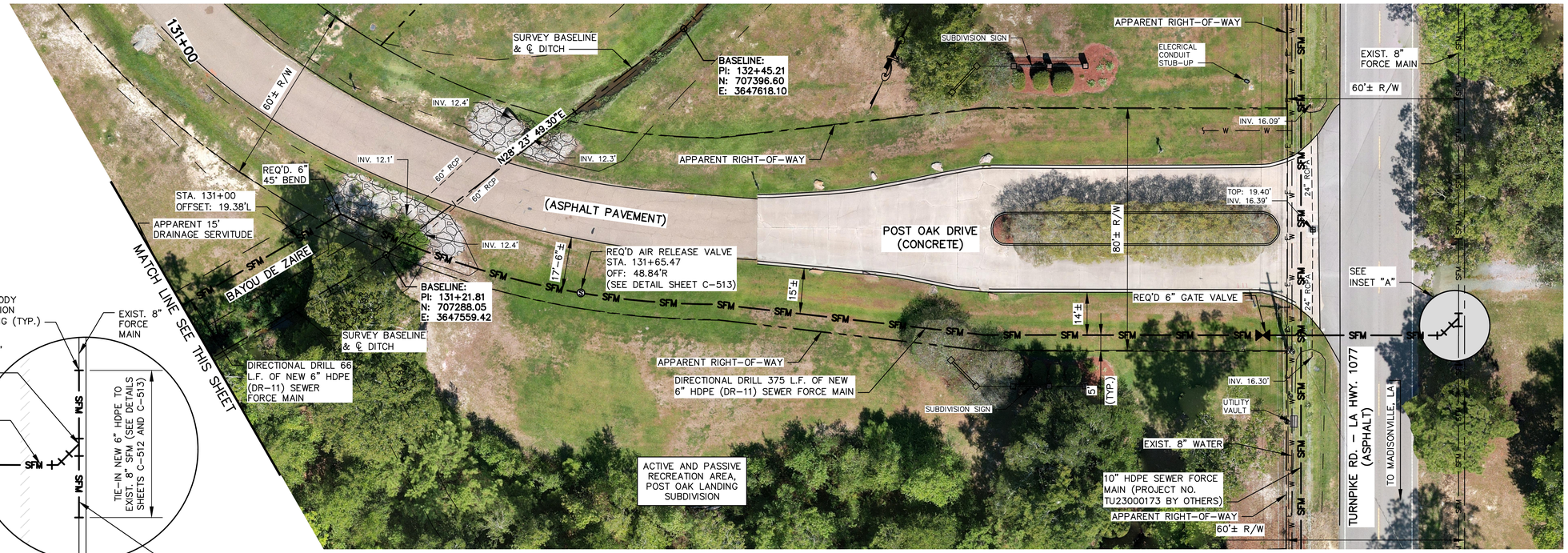
SHEET NO.
C-303
SHEET 21 of 42

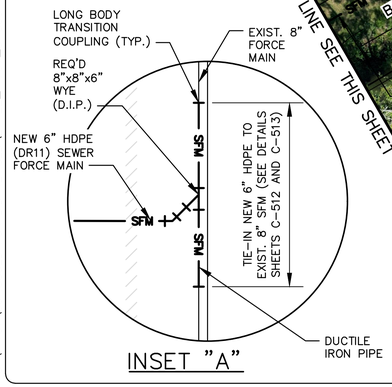
G:\11707\06 ISSUED FOR BID REVISED\21-22_11707_C-303-304_NEW POST OAK LIFT STATION_FORCE MAIN-PLANS.dwg [C-303] Jun 18, 2024 - 3:24pm by hbethea



GENERAL NOTES:

1. SURVEY BASELINE AND SERVITUDE INFORMATION SHOWN OBTAINED FROM "BREWSTER ROAD/LA 1077 DRAINAGE IMPROVEMENTS – PHASE I" BY NY ASSOCIATES, INC., PROJECT NO. EN 190000092.
2. CONTRACTOR SHALL FIELD VERIFY LOCATION OF EXISTING SEWER FORCE MAIN.
3. SEE DETAIL SHEET FOR AIR RELEASE VALVE. EXACT LOCATION TO BE DETERMINED IN THE FIELD.
4. CONTRACTOR TO VERIFY SIZE, MATERIAL, AND EXACT LOCATION OF EXISTING FORCE MAIN TO TIE INTO PRIOR TO ORDERING MATERIAL TO MAKE CONNECTION.
5. CONTRACTOR SHALL BE ALLOWED A MAXIMUM OF 4 HOURS TO MAKE TIE-IN AT LA HWY 1077. OWNER WILL SHUT DOWN ALL PUMP STATIONS CONNECTED TO THE TIE-IN FORCE MAIN. PROVIDE ADVANCE NOTICE AND COORDINATE WITH OWNER AND ENGINEER.





INSET "A"

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	TLB
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	1" = 20'

STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26372
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

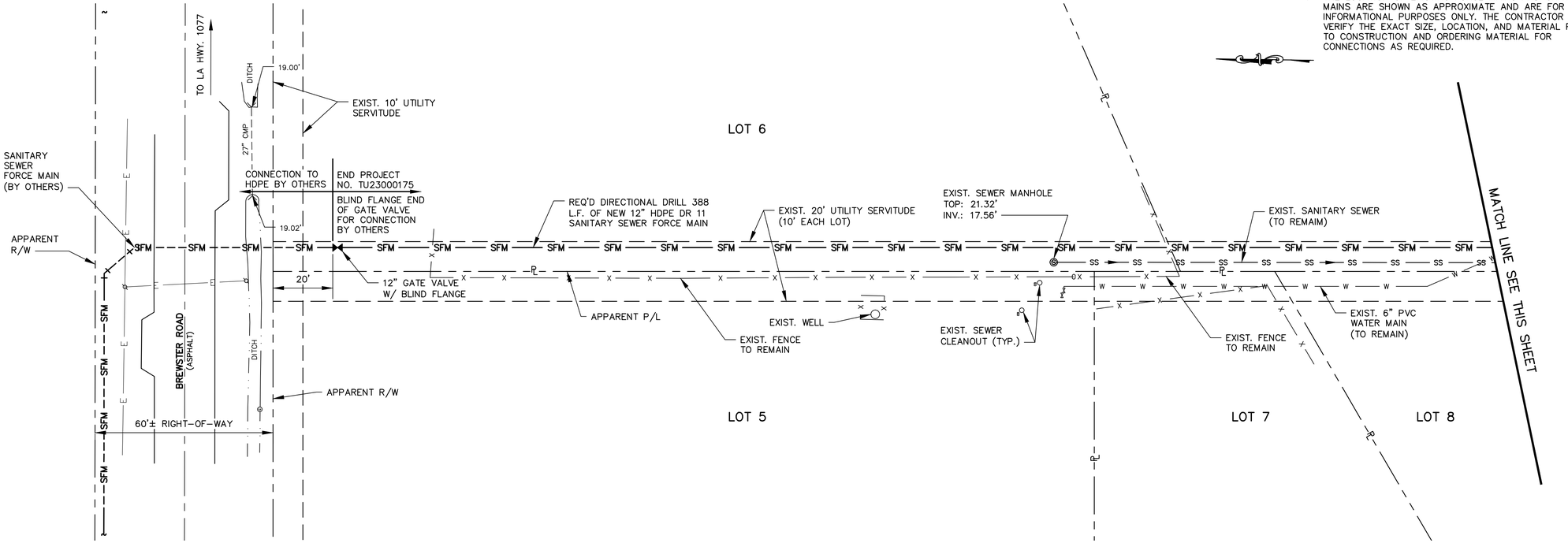
NEW POST OAK LIFT STATION FORCE MAIN – PLANS

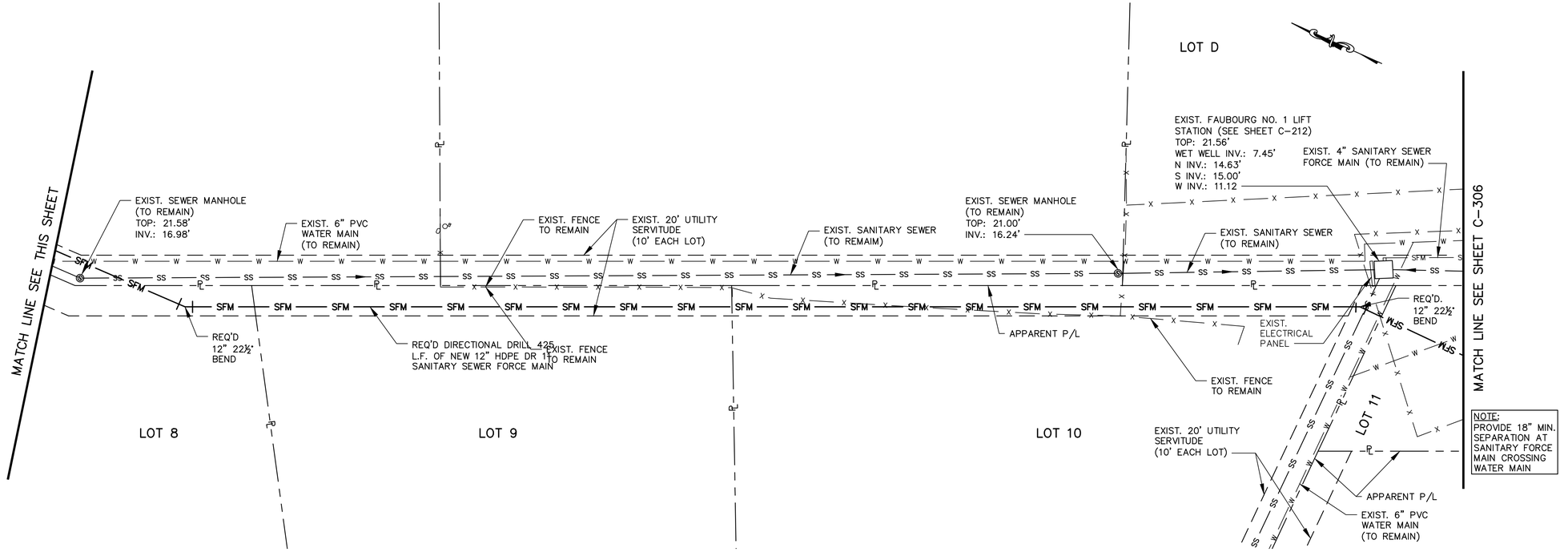
SHEET NO.
C-304
SHEET 22 of 42

G:\11707\06 ISSUED FOR BID REVISED\21-22_11707_C-303-304_NEW POST OAK LIFT STATION_FORCE MAIN-PLANS.dwg [C-304] Jun 18, 2024 - 3:24pm by hbethea

GENERAL NOTES:

1. THE LOCATION OF EXISTING FORCE MAINS AND GRAVITY MAINS ARE SHOWN AS APPROXIMATE AND ARE FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT SIZE, LOCATION, AND MATERIAL PRIOR TO CONSTRUCTION AND ORDERING MATERIAL FOR CONNECTIONS AS REQUIRED.





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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	TLB
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	1" = 20'

STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26372
ELECTRICAL
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

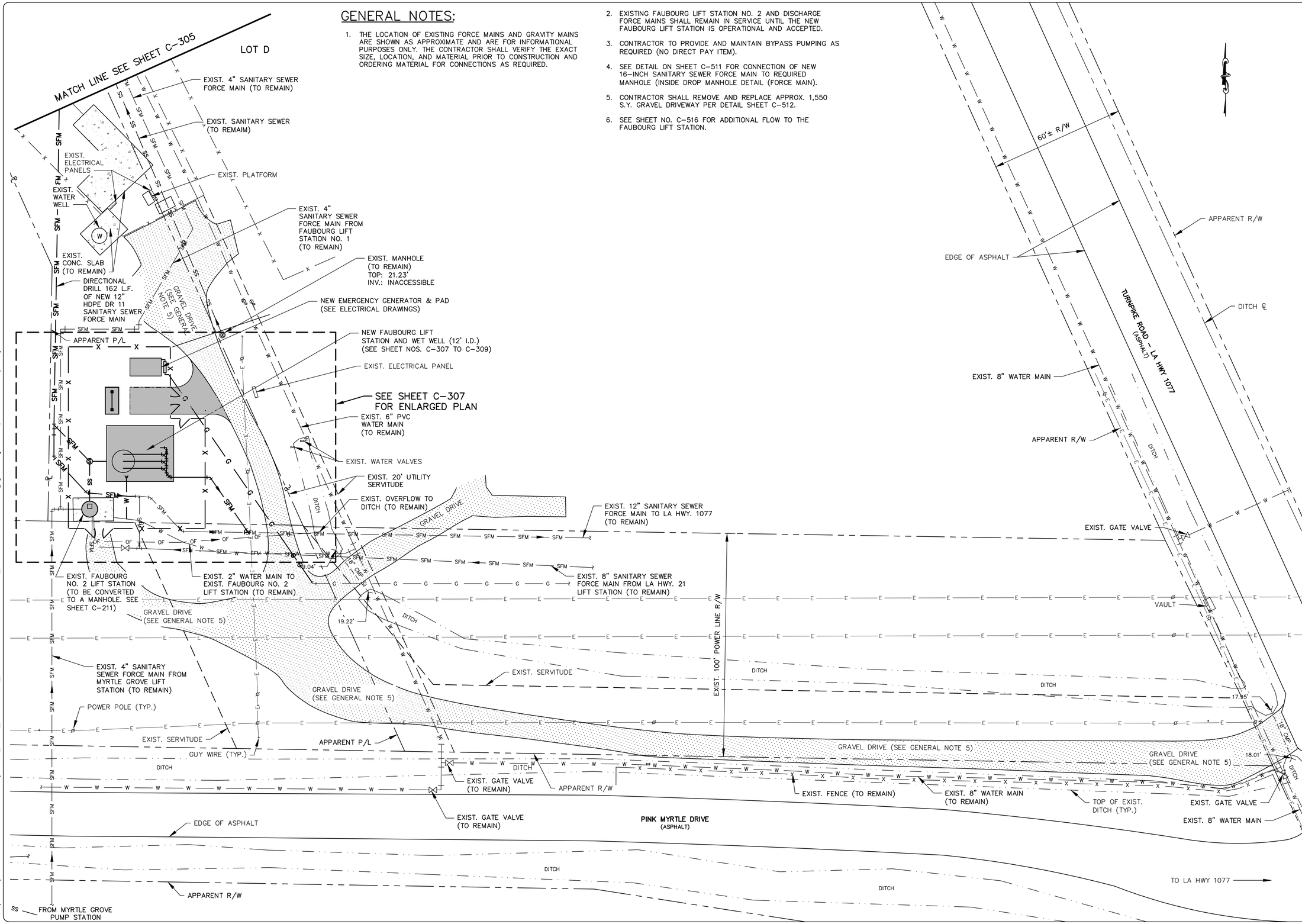
NEW FAUBOURG LIFT STATION FORCE MAIN – PLANS

SHEET NO.
C-305
SHEET 23 of 42

G:\11707\06 ISSUED FOR BID REVISED\23-24_11707_C-305-306_NEW FAUBOURG LIFT STATION_FORCE MAIN-PLANS.dwg [C-305] Jun 18, 2024 - 3:25pm by hbethea

GENERAL NOTES:

1. THE LOCATION OF EXISTING FORCE MAINS AND GRAVITY MAINS ARE SHOWN AS APPROXIMATE AND ARE FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT SIZE, LOCATION, AND MATERIAL PRIOR TO CONSTRUCTION AND ORDERING MATERIAL FOR CONNECTIONS AS REQUIRED.
2. EXISTING FAUBOURG LIFT STATION NO. 2 AND DISCHARGE FORCE MAINS SHALL REMAIN IN SERVICE UNTIL THE NEW FAUBOURG LIFT STATION IS OPERATIONAL AND ACCEPTED.
3. CONTRACTOR TO PROVIDE AND MAINTAIN BYPASS PUMPING AS REQUIRED (NO DIRECT PAY ITEM).
4. SEE DETAIL ON SHEET C–511 FOR CONNECTION OF NEW 16–INCH SANITARY SEWER FORCE MAIN TO REQUIRED MANHOLE (INSIDE DROP MANHOLE DETAIL (FORCE MAIN).
5. CONTRACTOR SHALL REMOVE AND REPLACE APPROX. 1,550 S.Y. GRAVEL DRIVEWAY PER DETAIL SHEET C–512.
6. SEE SHEET NO. C–516 FOR ADDITIONAL FLOW TO THE FAUBOURG LIFT STATION.



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

No.	DESCRIPTION OF REVISION	DATE:

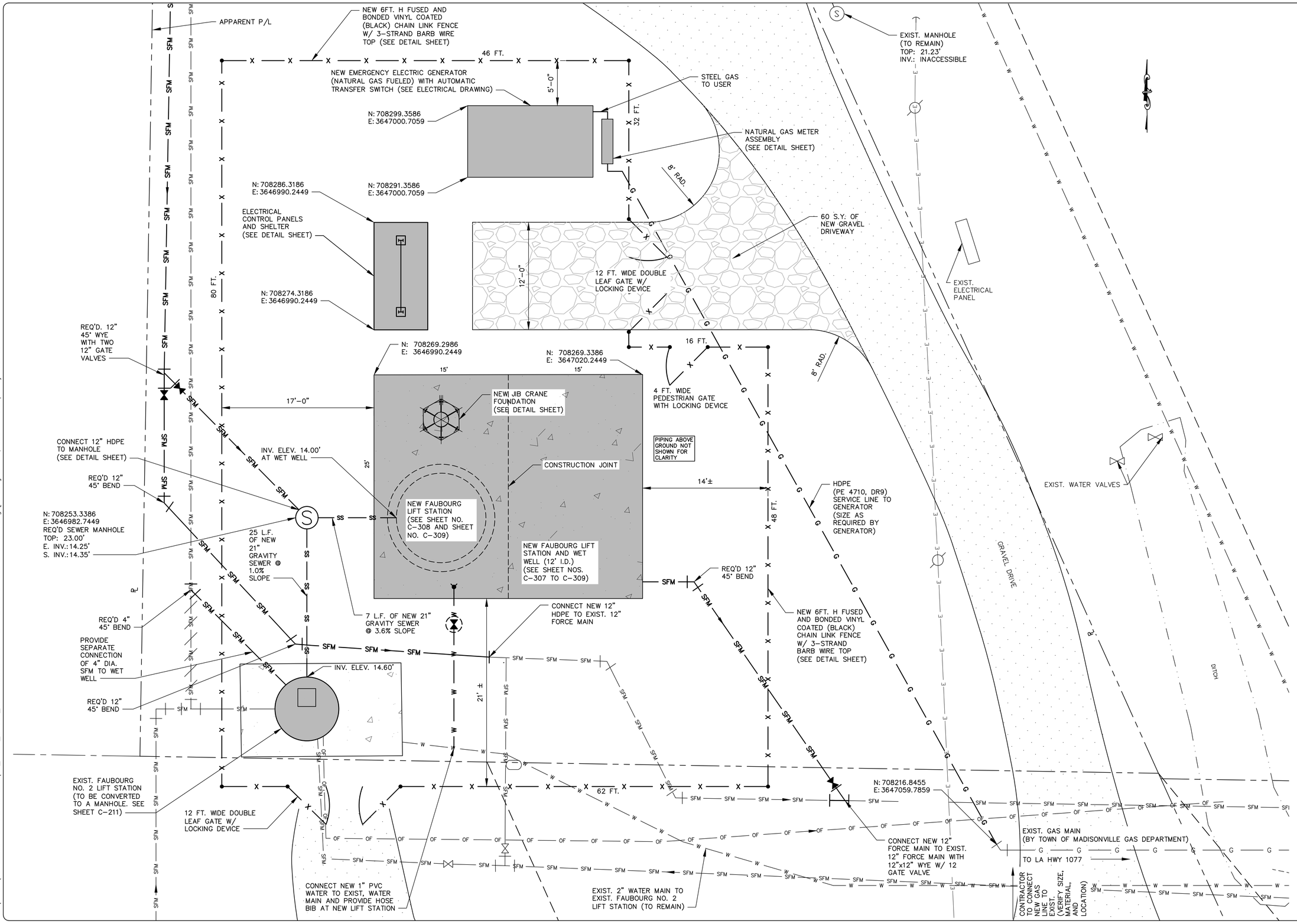
DESIGNED BY:	DAC
DRAWN BY:	GFJ
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171 TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	1" = 20'

STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26372
PROFESSIONAL ENGINEER IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171 & TU23000175

NEW FAUBOURG LIFT STATION – SITE PLAN

SHEET NO.
C–306
SHEET 24 of 42



G:\11707\06 ISSUED FOR BID REVISED\25_11707_C-307_NEW FAUBOURG LIFT STATION-ENLARGED SITE PLAN.dwg [C-307] Jun 18, 2024 - 3:25pm by hbethea

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	GFJ
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	1" = 5'

STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26372
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

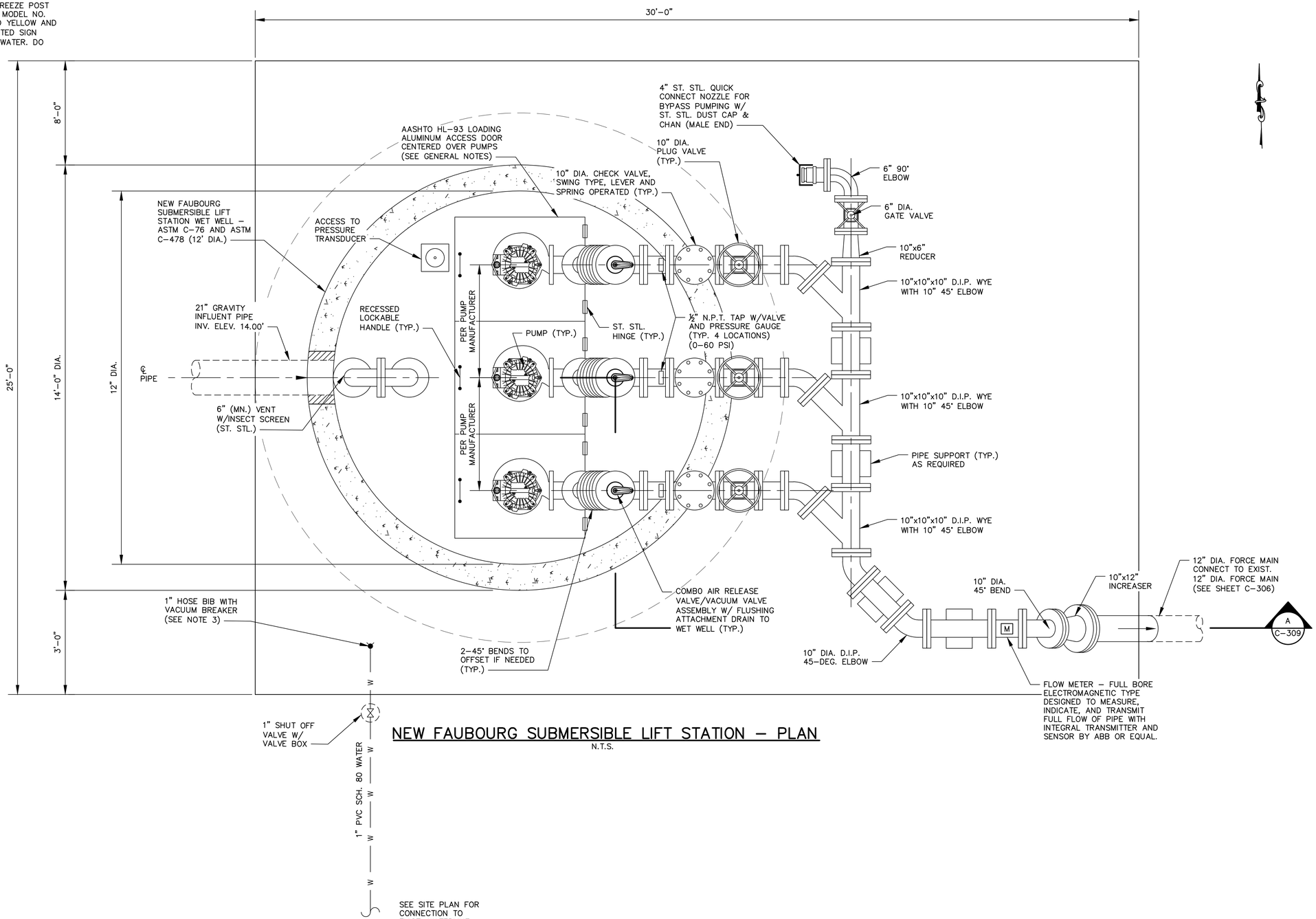
POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

NEW FAUBOURG LIFT STATION - ENLARGED SITE PLAN

SHEET NO.
C-307
SHEET 25 of 42

GENERAL NOTES:

1. ALL EXPOSED PIPING, VALVES, FITTINGS, ETC. SHALL BE PAINTED PER CONTRACT SPECIFICATIONS
.
2. PROVIDE INSULATED HOSE BIB AND PIPING AT LIFT STATION. (SEE SITE PLAN)
3. HOSE BIB SHALL BE NON–FREEZE POST HYDRANT ZURN INDUSTRIES MODEL NO. Z–1385 OR EQUAL. PAINTED YELLOW AND POST 10" W x 7" H LAMINATED SIGN "CAUTION – NON POTABLE WATER. DO NOT DRINK."



NEW FAUBOURG SUBMERSIBLE LIFT STATION – PLAN

N.T.S.

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	GFJ
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	AS SHOWN

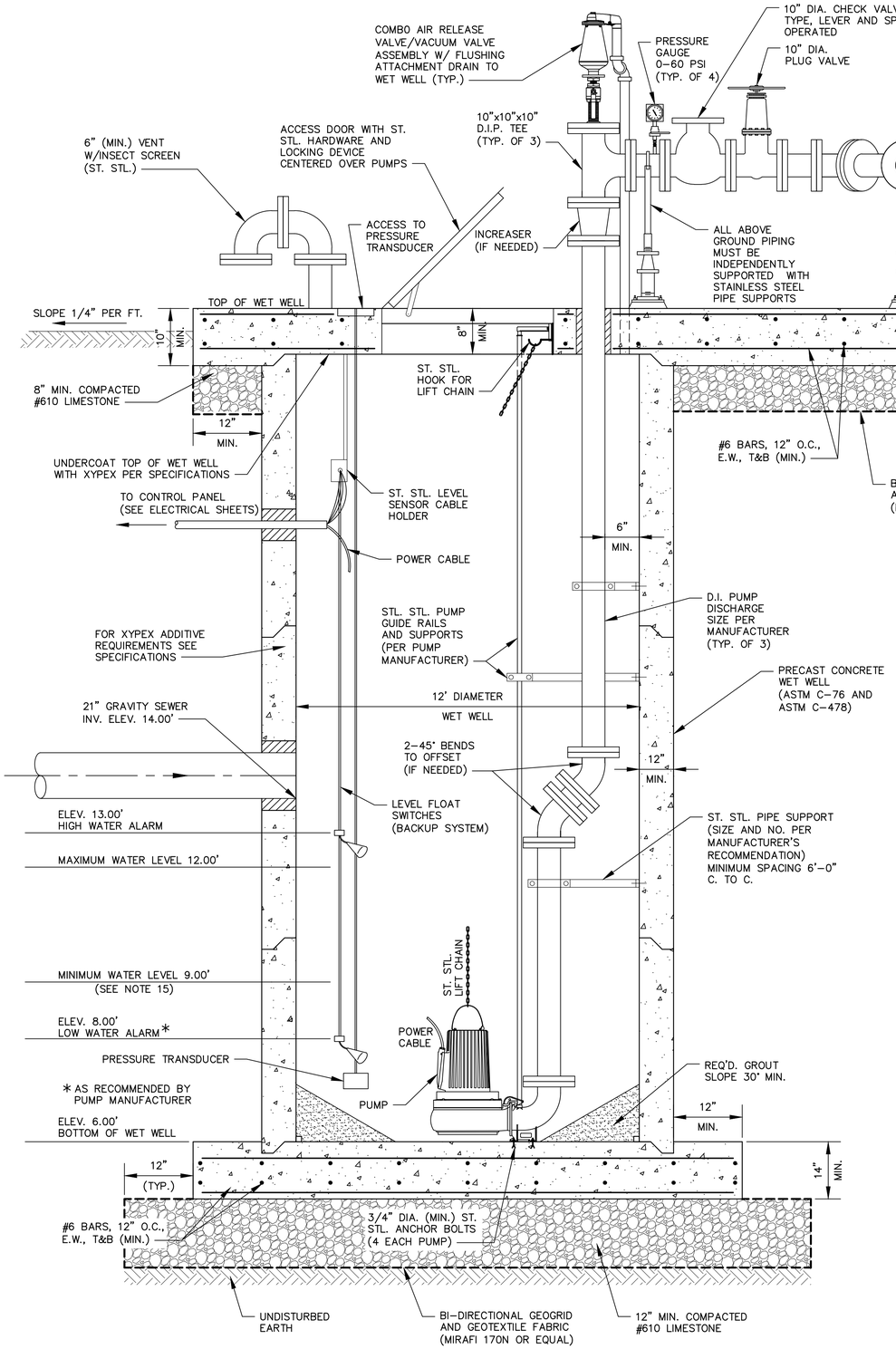
STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 28372
PROFESSIONAL ENGINEER IN CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

NEW FAUBOURG SUBMERSIBLE LIFT STATION – PLAN

SHEET NO.
C–308
SHEET 26 OF 42

G:\17\1707\06 ISSUED FOR BID REVISED\26-27_1707_C-308-309_NEW FAUBOURG LIFT STATION - SECTION.dwg [C-308] Jun 18, 2024 - 3:25pm by hbethea



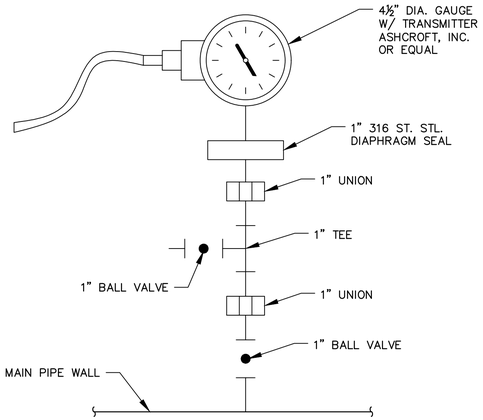
A 308 SECTION – NEW FAUBOURG SUBMERSIBLE LIFT STATION

N.T.S

TRIPLEX PUMP SCHEDULE FP-01, FP-02, FP-03))									
PUMPS SHALL BE FLYGT MODEL NP3301 OR EQUAL AND SHALL BE 1,775 RPM (MAX.), 85 HP (MAX.), 66% EFF. (MIN.). EACH PUMP SHALL BE CAPABLE OF PUMPING 1,100 GPM AT 136.5 FEET TOTAL DYNAMIC HEAD (DESIGN POINT). PUMPS SHALL OPERATE ON VARIABLE FREQUENCY DRIVE CONTROLS AGAINST THE FOLLOWING SYSTEM CURVE (SEE ELECTRICAL DRAWINGS):									
FLOW (GPM)	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500
HEAD (FT.)	132.2	133.1	134.1	135.2	136.5	137.8	139.2	140.7	142.3

GENERAL NOTES:

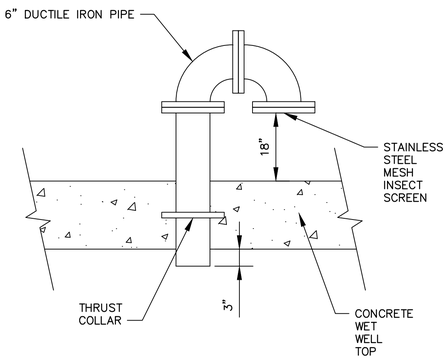
1. PIPING MAY BE SHOWN ROTATED FOR CLARITY.
2. WET WELL INTERIOR AND ALL EXPOSED D.I. PIPING AND VALVES SHALL BE COATED IN ACCORDANCE WITH THE SPECIFICATIONS.
3. ALL REINFORCING SHALL BE ASTM 615 GRADE 60, #6 BARS @ 12" CENTER TO CENTER, EACH WAY, TOP AND BOTTOM AS SHOWN. PROVIDE ADDITIONAL BARS AROUND OPENING.
4. ALL FASTENERS IN WET WELL SHALL BE 316 STAINLESS STEEL.
5. ALUMINUM HATCH SHALL BE BILCO MODEL JD-3ALH OR EQUAL WITH TYPE 316 STAINLESS STEEL HARDWARE, AND FALL PROTECTION. ALUMINUM IN CONTACT WITH CONCRETE SHALL BE PROTECTED WITH BITUMINOUS PROTECTIVE COATING. HATCH FRAME SHALL BE INTEGRALLY CAST WITH TOP COVER.ALUMINUM HATCH SHALL BE SIZED BY THE PUMP MANUFACTURER AND LOCATED TO PROVIDED ACCESS TO PUMPS AND VALVES. RATED FOR HL-93 WHEEL LOAD.
6. CONTROL PANEL AND ELECTRICAL NOT SHOWN, REFER TO ELECTRICAL DRAWINGS.
7. REFER TO SHEET C-307 FOR SITE PLAN.
8. REFER TO SPECIFICATIONS FOR PUMPS AND CONTROLS.
9. ALL ABOVE GROUND PIPING TO BE FLANGED JOINT AND BELOW GROUND DUCTILE IRON PIPE TO BE MECHANICAL JOINT.
10. CONTRACTOR SHALL PROVIDE BYPASS PUMPING AS REQUIRED AT ALL TIMES TO MAINTAIN FLOW. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL BYPASS PUMPING OPERATIONS AND SHALL CHECK/MAINTAIN BYPASS PUMPS SUCH THAT NO SEWER BACKUP OCCURS.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING AGAINST/PREVENTING WET WELL UPLIFT DURING CONSTRUCTION.
12. ALL CRITICAL ELECTRICAL AND CONTROL EQUIPMENT SHALL BE LOCATED A MINIMUM OF 1 FT. ABOVE BASE FLOOD ELEVATION.
13. PRIOR TO CONSTRUCTION, CONTRACTORS SHALL SUBMIT SHOP DRAWINGS OF EACH STRUCTURE AND FOR ALL EQUIPMENT DETAILING DIMENSIONS. PIPES/VALVES, CLEARANCE, SIZES, AND ANY OTHER NECESSARY DETAILS.
14. CONNECT TO THE NEW FORCE MAIN SHALL BE RESTRAINED MECHANICAL JOINT.
15. MINIMUM PUMP SUBMERGENCE SHALL BE 12"-18" PER MANUFACTURER'S REQUIREMENTS.



TYPICAL PRESSURE/VACUUM GAUGE

N.T.S.

NOTE:
GAUGES SHALL BE EQUIPPED WITH A PRESSURE TRANSMITTER WITH 4-20mA OUTPUT TO THE PUMP CONTROL PANEL



VENT PIPE DETAIL

NOT TO SCALE

ST. TAMMANY PARISH GOVERNMENT

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	GFJ
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	AS SHOWN

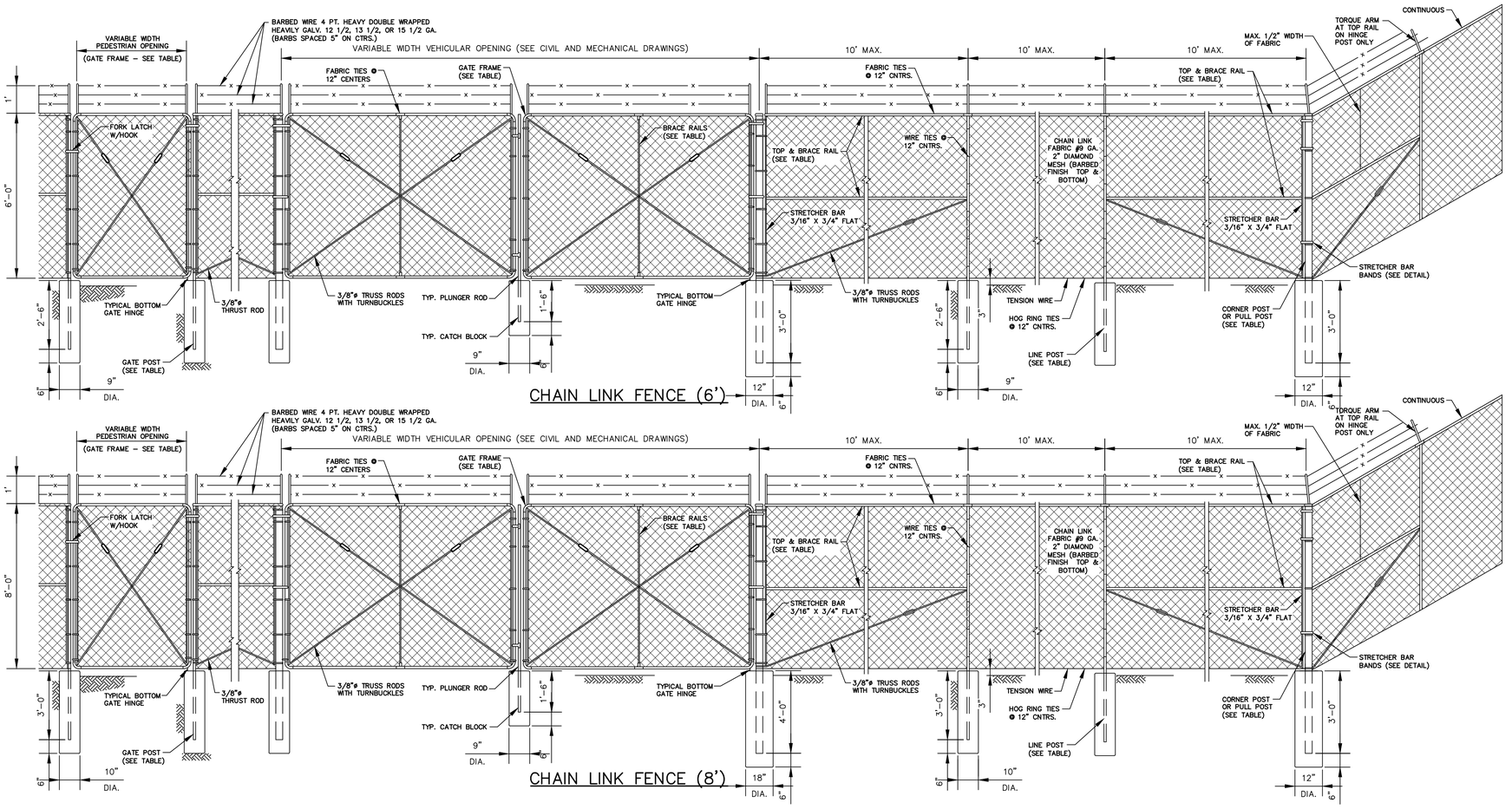
STATE OF LOUISIANA
DAVID A. COLSON
REG. NO. 28372
PROFESSIONAL ENGINEER IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

NEW FAUBOURG LIFT STATION – SECTION

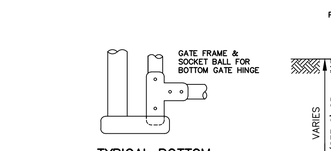
SHEET NO.
C-309
SHEET 27 OF 42

G:\17\2707.06 ISSUED FOR BID REVISED\26-27_17\07_C-306-309_NEW FAUBOURG LIFT STATION - SECTION.dwg [C-309] Jan 18, 2024 - 3:25pm by hbethea

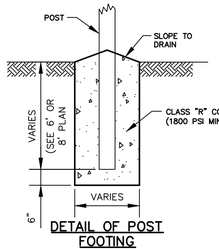


CHAIN LINK FENCE (6')

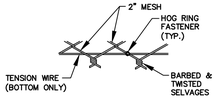
CHAIN LINK FENCE (8')



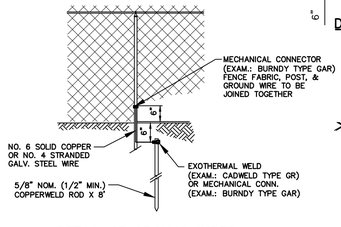
TYPICAL BOTTOM GATE HINGE



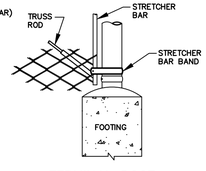
DETAIL OF POST FOOTING



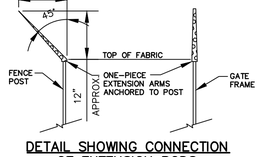
FABRIC & TENSION WIRE DETAIL



DETAIL OF GROUND WIRES FOR FENCES

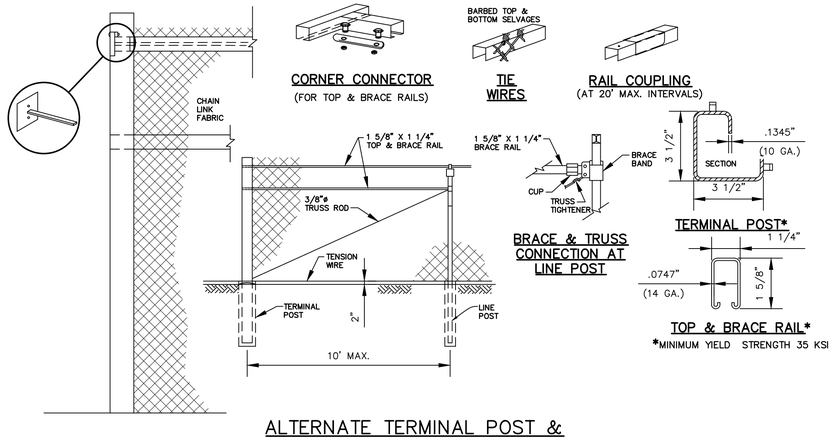


TERMINAL POST DETAIL



DETAIL SHOWING CONNECTION OF EXTENSION RODS

TYPICAL STRETCHER BAR BAND



ALTERNATE TERMINAL POST & DETAILS

NOTES:

1. MINIMUM YIELD STRENGTH=45 KSI, EXCEPT FOR 1.625 X 1.25 BRACE RAIL. SEE DETAIL.
2. SEE ASTM A120 FOR ADDITIONAL DETAILS.
3. ALTERNATE COATING REQUIREMENTS FOR ROUND SECTIONS– SECTIONS MAY BE EXTERNALLY COATED WITH NO LESS THAN 0.8 OZ./FT.² OF HIGH GRADE OR SPECIAL HIGH GRADE ZINC CONFORMING TO ASTM B6, FOLLOWED BY A CHROMATE CONVERSION COATING OF 30±10 MICRO-GRAMS/IN.² AND AN ELECTROSTATICALLY APPLIED THERMOPLASTIC ACRYLIC COATING HAVING A MINIMUM DRY FILM THICKNESS OF 0.3 MIL. THE INTERNAL SURFACE SHALL BE COATED WITH A ZINC RICH COATING OF NO LESS THAN 81% ZINC POWDER BY WEIGHT, 0.3 MIL OR GREATER IN THICKNESS.

		OUTSIDE DIA. (INCHES)	LBS. (2) (PER LIN. FT.)	ALTERNATE (INCHES) (3)	SECTION (1)	LBS. (PER LIN. FT.)
LINEPOST		2 3/8	3.65	2.375	ROUND	3.12
				2.25 X 1.70	H	4.12
				2.25 X 1.70	HEAVY C	2.73
				1.875 X 1.625	STD. C	2.34
RAIL BRACE		1 5/8	2.27	1.660	ROUND	1.84
				1.875 X 1.625	H	3.33
				1.625 X1.25	SEE DETAIL	1.35
GATE CORNER POST		2 7/8	2.27	2.875	ROUND	4.64
GATE POST		6 5/8	18.99		ROUND	
GATE FRAME		1 7/8	2.71	1.900	ROUND	2.28

NOTES:

1. THE FENCE INSTALLATION AND DETAILS SHOWN ARE TYPICAL AND MAY VARY IN ACCORDANCE WITH DIFFERENT MANUFACTURERS, PROVIDED THAT THEY MEET THE STANDARD SPECIFICATIONS.
2. TYPICAL INSTALLATION PLAN MAY VARY AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. LOCATION OF GATES TO BE SHOWN ON PLANS.
3. GROUNDING DEVICES ARE TO BE INSTALLED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
4. CONNECTIONS TO ALUMINUM ALLOY OR ALUMINUM COATED FENCE TO BE MADE WITH STEEL MECHANICAL CONNECTORS. ALL OTHER MECHANICAL CONNECTORS TO BE BRONZE.
5. ALL BOLTS TO BE UPSET TO DISCOURAGE VANDALISM.
6. ALL CONNECTION METHODS TO BE APPROVED BY THE PROJECT ENGINEER.
7. ALL FABRIC, FRAMEWORK, FITTINGS, GATES AND HARDWARE OF 6' AND 8' CHAIN LINK FENCE SHALL BE COATED IN DARK GREEN PVC COLOR COATING.
8. CHAIN LINK FENCE FABRIC SHALL BE FUSED AND BONDED VINYL COATED PER ASTM F668 (BLACK), CLASS 2b.
9. POLYMER COATED PIPE SHALL BE FUSED AND BONDED AND ADHERE TO EXTERIOR ZINC COATING IN ACCORDANCE WITH ASTM F1043. MIN. THICKNESS 10 MILS. BLACK COLOR.
10. TENSION WIRES, BARBED WIRES, TIE WIRES, AND OTHER HARDWARE SHALL BE POLYMER COATED BLACK. FITTINGS SHALL BE COATED PER ASTM F626 MIN. THICKNESS 0.006 IN.

ST. TAMMANY PARISH GOVERNMENT

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY: DAC
DRAWN BY: GFJ
CHECKED BY: TAA
SUBMITTED BY: DAC
PROJECT No.: TU23000171
TU23000175
ISSUE DATE: 05/2024
APPROVED BY: TAA
SHEET SIZE: ANSI D
SCALE: AS SHOWN

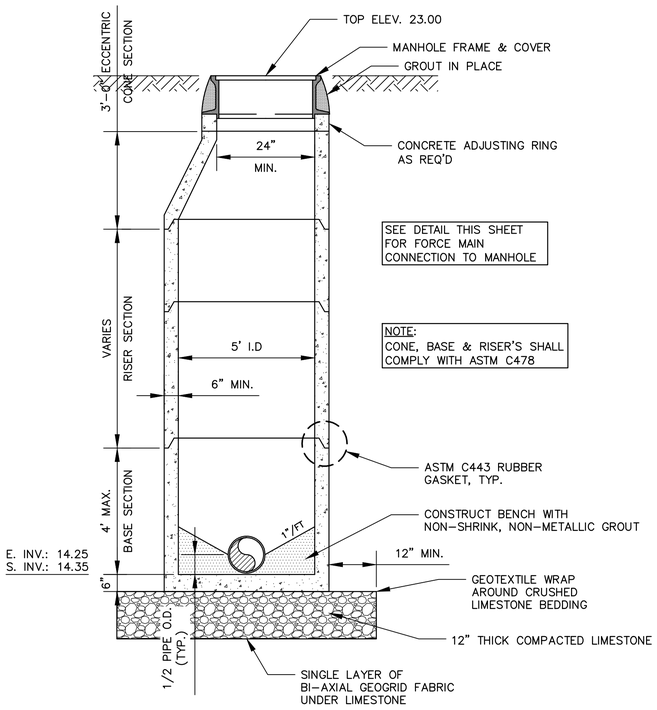
STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26372
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

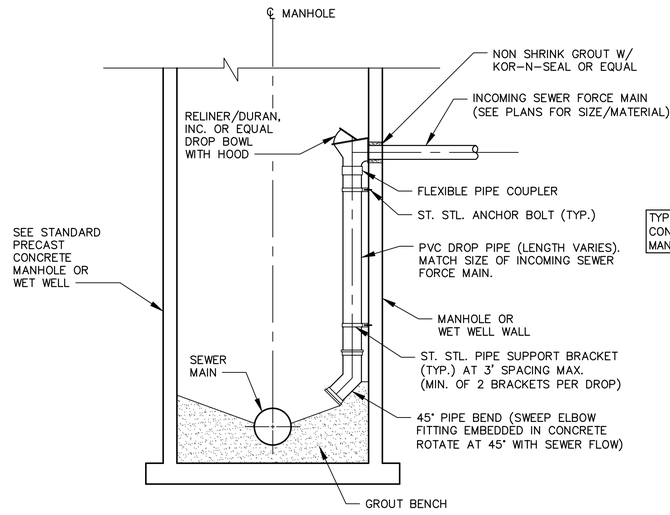
NEW FAUBOURG LIFT STATION – CHAINLINK FENCE DETAIL

SHEET NO.
C–310
SHEET 28 OF 42

G:\11707\06 ISSUED FOR BID REVSED\28_11707_C-310_NEW FAUBOURG CHAINLINK FENCE.dwg [C-310] Jun 18, 2024 - 3:26pm by hbethea

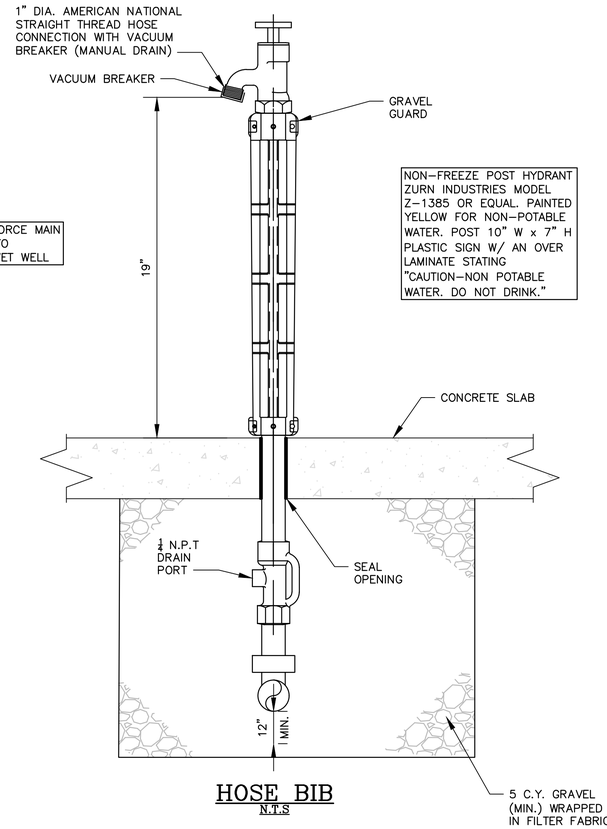


PRECAST CONCRETE MANHOLE @ FAUBOURG L.S.
N.T.S.

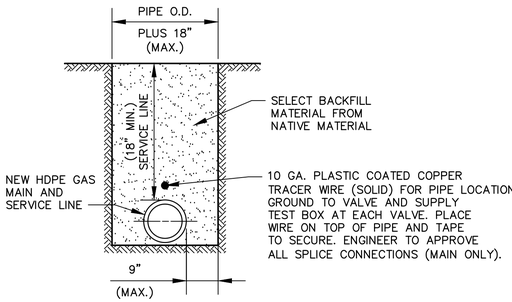


INSIDE DROP DETAIL (FORCE MAIN)
N.T.S.

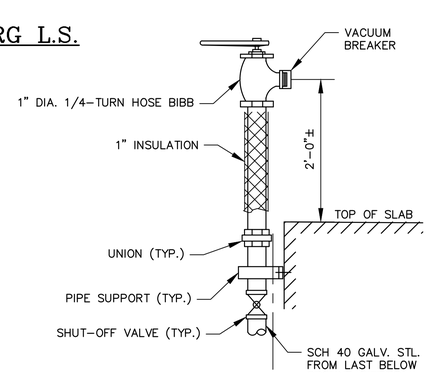
TYPICAL FOR FORCE MAIN CONNECTIONS TO MANHOLE OR WET WELL

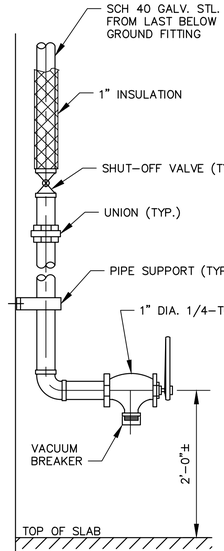


HOSE BIB
N.T.S



TYPICAL OPEN CUT TRENCH SECTION
N.T.S.

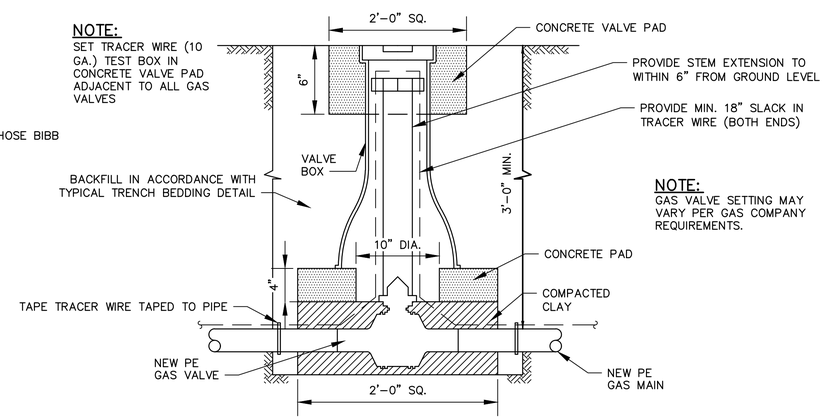




NOTE: PROVIDE WARNING SIGN WHEN USED FOR NON-POTABLE WATER. SIGN TO READ "CAUTION - NON-POTABLE WATER DO NOT DRINK"

TYPICAL HOSE BIBB MOUNTING
(NO DIRECT PAY ITEM)
N.T.S.

NOTE: SET TRACER WIRE (10 GA.) TEST BOX IN CONCRETE VALVE PAD ADJACENT TO ALL GAS VALVES



NOTE: GAS VALVE SETTING MAY VARY PER GAS COMPANY REQUIREMENTS.

TYPICAL GAS VALVE SETTING
N.T.S.

ST. TAMMANY PARISH GOVERNMENT

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	GFJ
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	N.T.S.

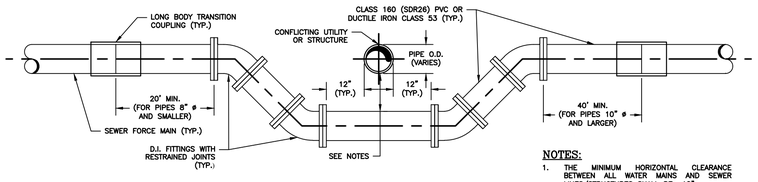
STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26372
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

SEWER STANDARD DETAILS
GRAVITY SEWER

SHEET NO.
C-511
SHEET 29 of 42

G:\11707\06 ISSUED FOR BID REVISED\29_11707_C-511_SewerStandardDetails.dwg [C-511] Jun 18, 2024 - 3:18pm by hbethea

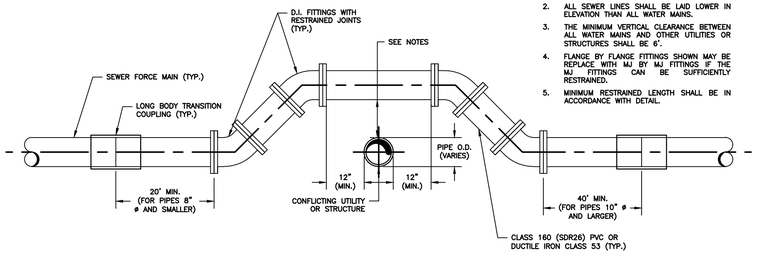


SEWER FORCE MAIN HORIZONTAL AND VERTICAL (UNDER) OFFSET DETAIL

(NOT TO SCALE)

NOTES:

1. THE MINIMUM HORIZONTAL CLEARANCE BETWEEN ALL WATER MAINS AND SEWER LINES/STRUCTURES SHALL BE 18".
2. ALL SEWER LINES SHALL BE LAID LOWER IN ELEVATION THAN ALL WATER MAINS.
3. THE MINIMUM HORIZONTAL CLEARANCE BETWEEN ALL WATER MAINS AND OTHER UTILITIES OR STRUCTURES SHALL BE 6'.
4. FLANGE BY FLANGE FITTINGS SHOWN MAY BE REPLACE WITH MJ BY MJ FITTINGS IF THE MJ FITTINGS CAN BE SUFFICIENTLY RESTRAINED.
5. MINIMUM RESTRAINED LENGTH SHALL BE IN ACCORDANCE WITH DETAIL.

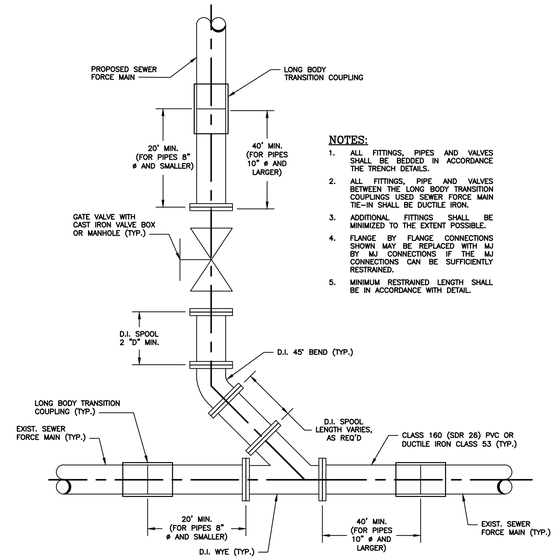


SEWER FORCE MAIN HORIZONTAL AND VERTICAL (OVER)OFFSET DETAIL

(NOT TO SCALE)

NOTES:

1. THE MINIMUM VERTICAL CLEARANCE BETWEEN ALL WATER MAINS AND SEWER LINES/STRUCTURES SHALL BE 18".
2. ALL SEWER LINES SHALL BE LAID LOWER IN ELEVATION THAN ALL WATER MAINS.
3. THE MINIMUM VERTICAL CLEARANCE BETWEEN ALL WATER MAINS AND OTHER UTILITIES OR STRUCTURES SHALL BE 6'.
4. FLANGE BY FLANGE FITTINGS SHOWN MAY BE REPLACE WITH MJ BY MJ FITTINGS IF THE MJ FITTINGS CAN BE SUFFICIENTLY RESTRAINED.
5. MINIMUM RESTRAINED LENGTH SHALL BE IN ACCORDANCE WITH DETAIL.

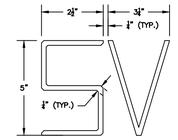


NOTES:

1. ALL FITTINGS, PIPES AND VALVES SHALL BE BEDDED IN ACCORDANCE THE TRENCH DETAILS.
2. ALL FITTINGS, PIPE AND VALVES BETWEEN THE LONG BODY TRANSITION COUPLINGS USED SEWER FORCE MAIN TIE-IN SHALL BE DUCTILE IRON.
3. ADDITIONAL FITTINGS SHALL BE MINIMIZED TO THE EXTENT POSSIBLE.
4. FLANGE BY FLANGE CONNECTIONS SHOWN MAY BE REPLACED WITH MJ BY MJ CONNECTIONS IF THE MJ CONNECTIONS CAN BE SUFFICIENTLY RESTRAINED.
5. MINIMUM RESTRAINED LENGTH SHALL BE IN ACCORDANCE WITH DETAIL.

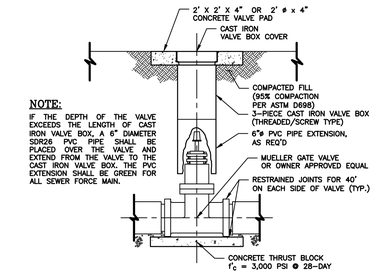
TYPICAL SEWER FORCE MAIN TIE-IN DETAIL

(NOT TO SCALE)



SEWER FORCE MAIN VALVE PAVEMENT STAMP DETAIL

(NOT TO SCALE)

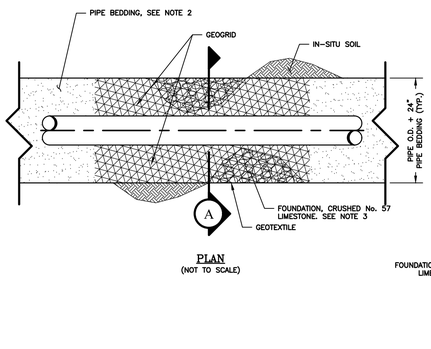


NOTE:

IF THE DEPTH OF THE VALVE EXCEEDS THE LENGTH OF CAST IRON VALVE BOX, A 6" DIAMETER SDR26 PVC PIPE SHALL BE PLACED OVER THE VALVE AND EXTEND FROM THE VALVE TO THE CAST IRON VALVE BOX. THE PVC EXTENSION SHALL BE GREEN FOR ALL SEWER FORCE MAIN.

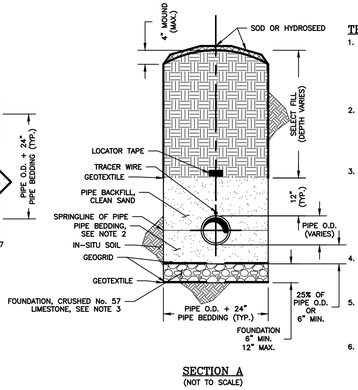
VALVE BOX FOR NON-TRAFFIC AREAS

(NOT TO SCALE)



PLAN

(NOT TO SCALE)



SECTION A

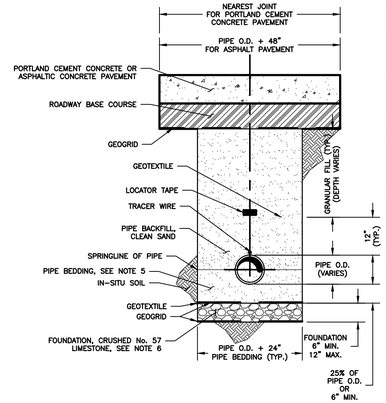
(NOT TO SCALE)

TRENCH DETAIL

(NOT TO SCALE)

TRENCH DETAIL NOTES:

1. SELECT FILL SHALL BE A SILTY OR CLAYEY SAND COMPLYING WITH AASHTO GROUP CLASSIFICATION A-2-4. IN-SITU SOILS USED AS SELECT FILL SHALL MEET AASHTO GROUP CLASSIFICATION A-2-4 AND SHALL BE FREE OF LARGE DEBRIS, LARGE ROCKS, ROOTS, AND OTHER DELETERIOUS MATERIALS. SELECT FILL SHALL HAVE MINIMUM COMPACTION OF 95% OF THE MAXIMUM DRY UNIT WEIGHT AS DETERMINED BY ASTM D698.
2. BEDDING MATERIALS FOR GRAVITY SEWER AND SEWER FORCE MAINS SHALL BE A CLEAN SAND COMPLYING WITH AASHTO GROUP CLASSIFICATION A-3. ALL BEDDING MATERIALS SHALL BE PLACED IN LOOSE LIFTS NOT EXCEEDING A THICKNESS OF EIGHT INCHES (8") PER LIFT. SANDY BEDDING MATERIALS SHALL HAVE MINIMUM COMPACTION OF 95% OF THE MAXIMUM DRY UNIT WEIGHT AS DETERMINED BY ASTM D698.
3. A CRUSHED No. 57 LIMESTONE FOUNDATION SHALL BE USED TO STABILIZE SOFT AND/OR WET BOTTOM OF EXCAVATION. A MINIMUM OF 6 INCHES OF SOFT AND/OR WET NATIVE MATERIAL SHALL BE REMOVED PRIOR TO PLACING THE CRUSHED LIMESTONE FOUNDATION. CRUSHED No. 57 LIMESTONE SHALL BE PLACED IN LOOSE LIFTS NOT EXCEEDING A THICKNESS OF EIGHT INCHES (8") PER LIFT. CRUSHED LIMESTONE FOUNDATION SHALL HAVE MINIMUM COMPACTION OF 90% OF THE MAXIMUM DRY UNIT WEIGHT AS DETERMINED BY ASTM D4253.
4. THE PLACEMENT OF GEOGRID SHALL BE AS SHOWN ON THE DETAIL. ALL GEOGRID SHALL BE A BIAXIAL GEOGRID SUCH AS TENSAR BX1200, SYNTEC SBX12 OR APPROVED EQUAL. TRANSVERSE AND LONGITUDINAL OVERLAP SHALL BE A MINIMUM OF 24 INCHES.
5. THE PLACEMENT OF GEOTEXTILE FABRIC SHALL BE AS SHOWN ON THE DETAIL. GEOTEXTILE FABRIC SHALL BE MIRAFI 500X, PROPEX GEOTEXT 200ST OR APPROVED EQUAL. TRANSVERSE AND LONGITUDINAL OVERLAP SHALL BE A MINIMUM OF 24 INCHES.
6. CONCRETE THRUST BLOCK SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3,000 PSI.

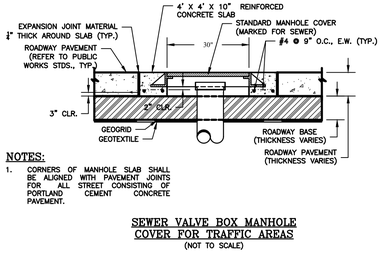


UNDER PAVEMENT TRENCH DETAIL

(NOT TO SCALE)

UNDER PAVEMENT TRENCH DETAIL NOTES:

1. ROADS, CURBS, DRIVEWAY APRONS AND SIDEWALKS TO BE IMPACTED BY EXCAVATION FOR SEWER OR WATER LINE REPAIRS SHALL BE REMOVED AND REPLACED TO NEAREST JOINT. WHEN THE SEWER OR WATER LINE WILL BE REPAIRED UNDER ASPHALT PAVEMENT, THE ASPHALTIC CONCRETE PAVEMENT SHALL BE SAW CUT BEFORE TEARING OUT PAVEMENT.
2. ASPHALTIC CONCRETE PAVEMENT, BASE COURSE AND PORTLAND CEMENT CONCRETE PAVEMENT SHALL COMPLY WITH THE CURRENT VERSION OF THE STANDARD PLANS AND SPECIFICATIONS PROMULGATED BY THE LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT.
3. PORTLAND CEMENT CONCRETE PAVEMENT USED FOR ROADWAYS SHALL HAVE A MINIMUM 3-DAY COMPRESSIVE STRENGTH OF 4,000 PSI.
4. GRANULAR BACKFILL SHALL BE CLEAN SAND COMPLYING WITH AASHTO GROUP CLASSIFICATION A-3. GRANULAR BACKFILL SHALL BE PLACED IN LOOSE LIFTS NOT EXCEEDING A THICKNESS OF EIGHT INCHES (8") PER LIFT. GRANULAR BACKFILL SHALL HAVE MINIMUM COMPACTION OF 95% OF THE MAXIMUM DRY UNIT WEIGHT AS DETERMINED BY ASTM D698.
5. BEDDING MATERIALS FOR GRAVITY SEWER AND SEWER FORCE MAINS SHALL BE A CLEAN SAND COMPLYING WITH AASHTO GROUP CLASSIFICATION A-3. ALL BEDDING MATERIALS SHALL BE PLACED IN LOOSE LIFTS NOT EXCEEDING A THICKNESS OF EIGHT INCHES (8") PER LIFT. SANDY BEDDING MATERIALS SHALL HAVE MINIMUM COMPACTION OF 95% OF THE MAXIMUM DRY UNIT WEIGHT AS DETERMINED BY ASTM D698.
6. A CRUSHED No. 57 LIMESTONE FOUNDATION SHALL BE USED TO STABILIZE SOFT AND/OR WET BOTTOM OF EXCAVATION. A MINIMUM OF 6 INCHES OF SOFT AND/OR WET NATIVE MATERIAL SHALL BE REMOVED PRIOR TO PLACING THE CRUSHED LIMESTONE FOUNDATION. CRUSHED No. 57 LIMESTONE SHALL BE PLACED IN LOOSE LIFTS NOT EXCEEDING A THICKNESS OF EIGHT INCHES (8") PER LIFT. CRUSHED LIMESTONE FOUNDATION SHALL HAVE MINIMUM COMPACTION OF 90% OF THE MAXIMUM DRY UNIT WEIGHT AS DETERMINED BY ASTM D4253.
7. THE PLACEMENT OF GEOGRID SHALL BE AS SHOWN ON THE DETAIL. ALL GEOGRID SHALL BE A BIAXIAL GEOGRID SUCH AS TENSAR BX1200, SYNTEC SBX12 OR APPROVED EQUAL. TRANSVERSE AND LONGITUDINAL OVERLAP SHALL BE A MINIMUM OF 24 INCHES.
8. THE PLACEMENT OF GEOTEXTILE FABRIC SHALL BE AS SHOWN ON THE DETAIL. GEOTEXTILE FABRIC SHALL BE MIRAFI 500X, PROPEX GEOTEXT 200ST OR APPROVED EQUAL. TRANSVERSE AND LONGITUDINAL OVERLAP SHALL BE A MINIMUM OF 24 INCHES.
9. CONCRETE THRUST BLOCK SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3,000 PSI.

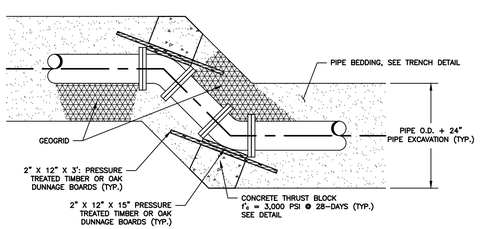


NOTES:

1. CORNERS OF MANHOLE SLAB SHALL BE ALIGNED WITH PAVEMENT JOINTS FOR ALL STREET CONSISTING OF PORTLAND CEMENT CONCRETE PAVEMENT.

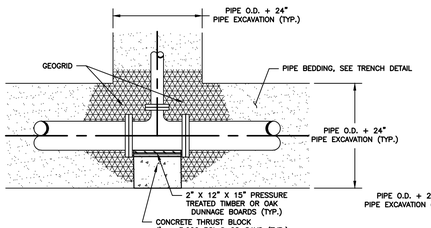
SEWER VALVE BOX MANHOLE COVER FOR TRAFFIC AREAS

(NOT TO SCALE)



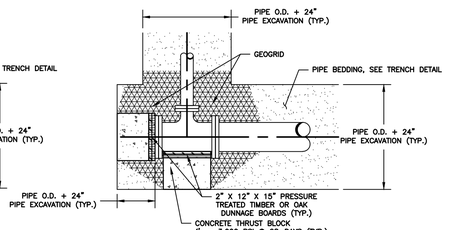
THRUST BLOCK DETAILS FOR BENDS

(NOT TO SCALE)



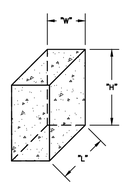
THRUST BLOCK DETAILS FOR TEES

(NOT TO SCALE)



THRUST BLOCK DETAILS FOR TEES AND PLUGS

(NOT TO SCALE)



MINIMUM THRUST BLOCK SIZES BY FITTING TYPE

FITTING TYPE	DIMENSION "W"	DIMENSION "H"	DIMENSION "L"
11.25°	6" MIN. OR 3 "D" / 2	2 "D" + PIPE O.D.	"D" MIN.
22.5°	6" MIN. OR 3 "D" / 2	2 "D" + PIPE O.D.	"D" MIN.
45°	6" MIN. OR 3 "D" / 2	2 "D" + PIPE O.D.	2 "D" MIN.
90°	6" + 2 "D"	2 "D" + PIPE O.D.	3 "D" MIN.
TEE	6" MIN. OR 3 "D" / 2	2 "D" + PIPE O.D.	2 "D" MIN.
WYE	6" MIN. OR 3 "D" / 2	2 "D" + PIPE O.D.	2 "D" MIN.
PLUG	6" MIN. OR 3 "D" / 2	3 "D"	3 "D"

ST. TAMMANY PARISH GOVERNMENT

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	GFJ
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	N.T.S.

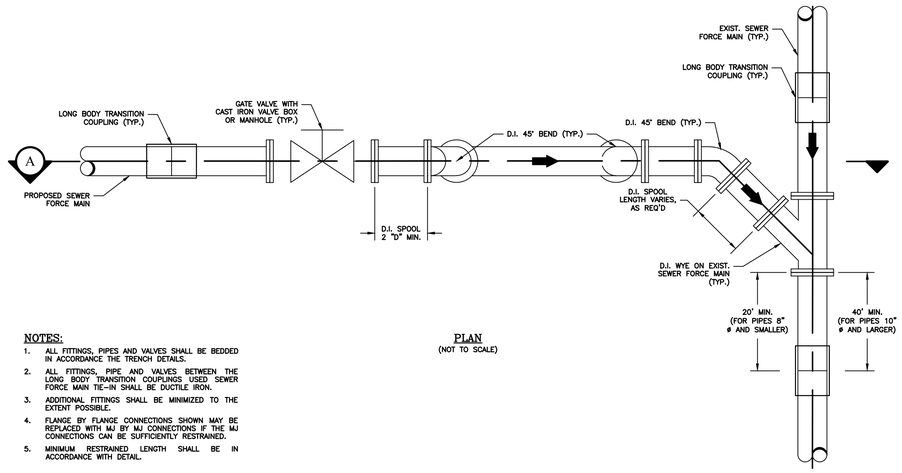
STATE OF LOUISIANA
DAVID A. COLSON
REG. 26372
PROFESSIONAL ENGINEER IN
CIVIL
5/22/2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

SEWER STANDARD DETAILS
SEWER FORCE MAINS

SHEET NO.
C-512
SHEET 30 of 42

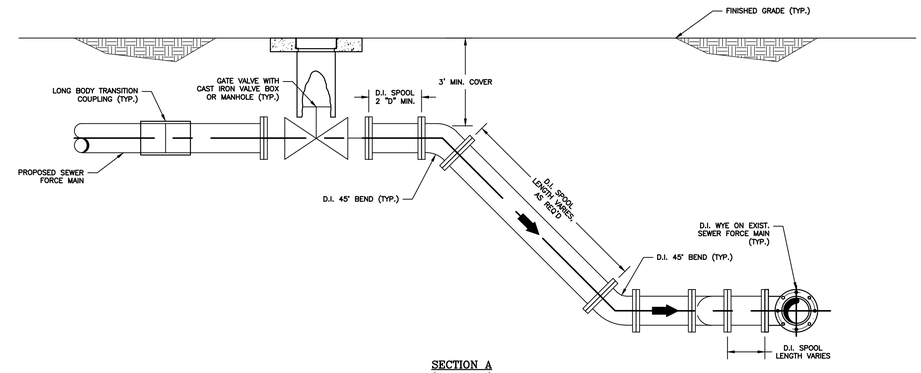
G:\11707\06 ISSUED FOR BID REVISED\30_11707_C-512_SewerStandardDetails.dwg [C-512] May 21, 2024 - 1:25pm by hbethea



NOTES:

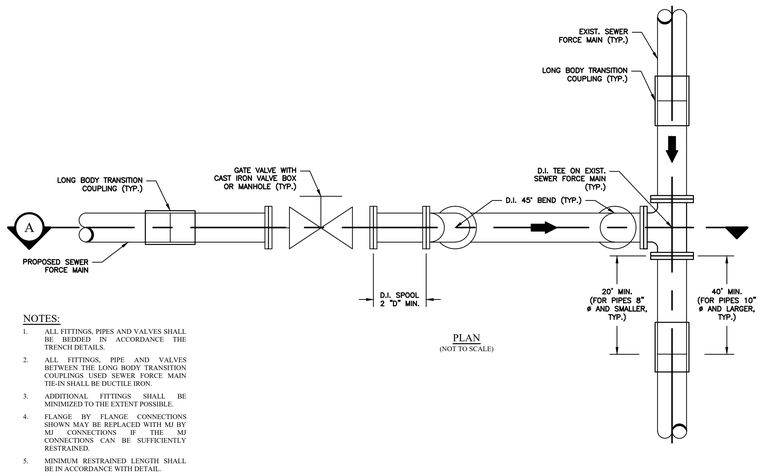
1. ALL FITTINGS, PIPES AND VALVES SHALL BE BEDDED IN ACCORDANCE THE TRENCH DETAILS.
2. ALL FITTINGS, PIPE AND VALVES BETWEEN THE LONG BODY TRANSITION COUPLINGS USED SEWER FORCE MAIN TIE-IN SHALL BE DUCTILE IRON.
3. ADDITIONAL FITTINGS SHALL BE MINIMIZED TO THE EXTENT POSSIBLE.
4. FLANGE BY FLANGE CONNECTIONS SHOWN MAY BE REPLACED WITH MJ BY MJ CONNECTIONS IF THE MJ CONNECTIONS CAN BE SUFFICIENTLY RESTRAINED.
5. MINIMUM RESTRAINED LENGTH SHALL BE IN ACCORDANCE WITH DETAIL.

PLAN
(NOT TO SCALE)



SECTION A
(NOT TO SCALE)

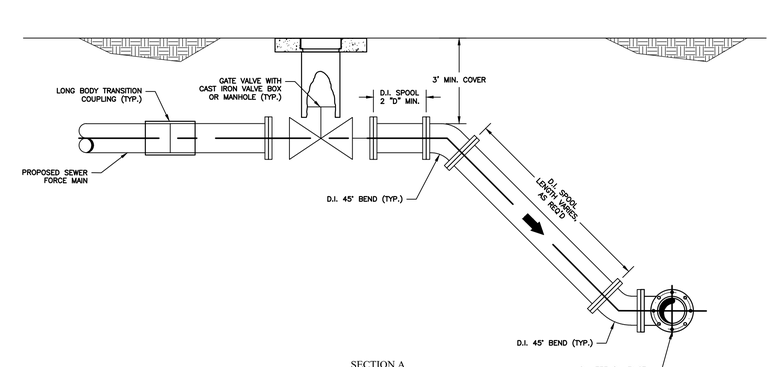
SEWER FORCE MAINS AT DIFFERENT ELEVATIONS TIE-IN DETAIL (USING A WYE)
(NOT TO SCALE)



NOTES:

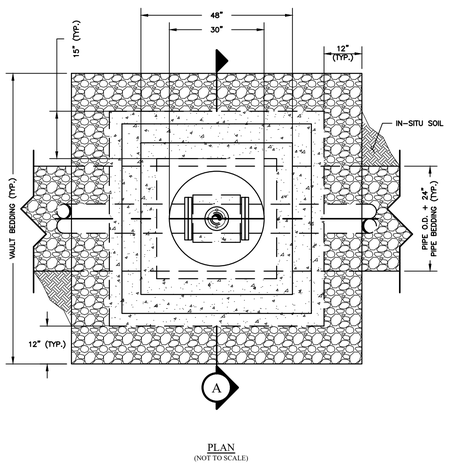
1. ALL FITTINGS, PIPES AND VALVES SHALL BE BEDDED IN ACCORDANCE THE TRENCH DETAILS.
2. ALL FITTINGS, PIPE AND VALVES BETWEEN THE LONG BODY TRANSITION COUPLINGS USED SEWER FORCE MAIN TIE-IN SHALL BE DUCTILE IRON.
3. ADDITIONAL FITTINGS SHALL BE MINIMIZED TO THE EXTENT POSSIBLE.
4. FLANGE BY FLANGE CONNECTIONS SHOWN MAY BE REPLACED WITH MJ BY MJ CONNECTIONS IF THE MJ CONNECTIONS CAN BE SUFFICIENTLY RESTRAINED.
5. MINIMUM RESTRAINED LENGTH SHALL BE IN ACCORDANCE WITH DETAIL.

PLAN
(NOT TO SCALE)

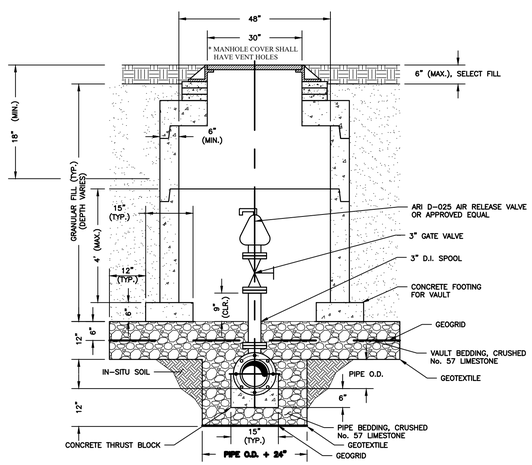


SECTION A
(NOT TO SCALE)

SEWER FORCE MAINS AT DIFFERENT ELEVATIONS TIE-IN DETAIL (USING A TEE)
(NOT TO SCALE)



PLAN
(NOT TO SCALE)



SECTION A
(NOT TO SCALE)

AIR RELEASE VALVE & UTILITY VAULT DETAIL
(NOT TO SCALE)

AIR RELEASE VALVE & VAULT DETAIL NOTES:

1. PRE-CAST CONCRETE, OPEN-BOTTOM VAULTS SHALL BE USED TO CONSTRUCT THE ARV VAULTS. VAULTS SHALL BE CONSTRUCTED OF PRE-CAST, REINFORCED CONCRETE STRUCTURE CONFORMING TO ASTM C858. ALL COMPONENTS OF THE VAULTS (I.E. FOOTING, RISER, AND TOP) SHALL CONFORM TO ASTM C858. THE PRE-CAST VAULT STRUCTURE SHALL BE DESIGNED TO MEET OR EXCEED AASHTO HS-20 LOADING.
2. CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI. CONCRETE SHALL CONTAIN XYPEX CONTENT OF AT LEAST 3% BY WEIGHT. REINFORCING STEEL SHALL BE GRADE 60 AND CONFORM TO ASTM A615.
3. CONCRETE SHALL BE FORTIFIED WITH "CON-SHIELD" CON-SHIELD SHALL BE ADDED IN ADDITION TO XYPEX.
4. JOINTS IN THE VAULT SECTIONS SHALL BE SEALED WITH "RAM-NEK" OR A RUBBER GASKET CONFORMING TO ASTM C433.
5. MANHOLE FRAMES AND COVERS SHALL BE GRAY IRON CONFORMING TO ASTM A-48. MANHOLE FRAMES AND COVERS SHALL EAST JORDAN IRON WORKS OR US FOUNDRY. ALL MANHOLE FRAMES AND COVERS SHALL BE RATED FOR AASHITO HL-93 LOADING.
6. MANHOLE COVERS SHALL HAVE DIAMOND TREAD PATTERN AND HAVE WORD "SEWER" CAST ON THE COVER AND VENT HOLES.
7. SELECT FILL SHALL BE A SILTY OR CLAYEY SAND COMPLYING WITH AASHTO GROUP CLASSIFICATION A-2-4. IN-SITU SOILS USED AS SELECT FILL SHALL MEET AASHITO GROUP CLASSIFICATION A-2-4 AND SHALL BE FREE OF LARGE DEBRIS, LARGE ROCKS, ROOTS, AND OTHER DELETERIOUS MATERIALS. SELECT FILL SHALL HAVE MINIMUM COMPACTION OF 95% OF THE MAXIMUM DRY UNIT WEIGHT AS DETERMINED BY ASTM D698.
8. GRANULAR BACKFILL AROUND THE ARV VAULT SHALL BE CLEAN SAND COMPLYING WITH AASHTO GROUP CLASSIFICATION A-3. GRANULAR BACKFILL SHALL BE PLACED IN LOOSE LIFTS NOT EXCEEDING A THICKNESS OF EIGHT INCHES (8") PER LIFT. GRANULAR BACKFILL SHALL HAVE MINIMUM COMPACTION OF 95% OF THE MAXIMUM DRY UNIT WEIGHT AS DETERMINED BY ASTM D698.
9. BEDDING MATERIALS FOR ARV VAULT AND SEWER FORCE MAIN SHALL BE A CRUSHED No. 57 LIMESTONE. BEDDING MATERIALS SHALL BE PLACED IN LOOSE LIFTS NOT EXCEEDING A THICKNESS OF EIGHT INCHES (8") PER LIFT. GRANULAR BACKFILL SHALL HAVE MINIMUM COMPACTION OF 90% OF THE MAXIMUM DRY UNIT WEIGHT AS DETERMINED BY ASTM D4253.
10. THE PLACEMENT OF GEOGRID SHALL BE AS SHOWN ON THE DETAIL. ALL GEOGRID SHALL BE A BIAXIAL GEOGRID SUCH AS TENSAR BX1200, SYNTEC SBX12 OR APPROVED EQUAL. TRANSVERSE AND LONGITUDINAL OVERLAP SHALL BE A MINIMUM OF 24 INCHES.
11. THE PLACEMENT OF GEOTEXTILE FABRIC SHALL BE AS SHOWN ON THE DETAIL. GEOTEXTILE FABRIC SHALL BE MIRAFI 500X, PROPEX GEOTEXT 200ST OR APPROVED EQUAL. TRANSVERSE AND LONGITUDINAL OVERLAP SHALL BE A MINIMUM OF 24 INCHES.
12. CONCRETE THRUST BLOCK SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3,000 PSI.
13. AIR RELEASE VALVES SHALL BE ARI D-025 AIR RELEASE VALVE FOR WASTEWATER OR APPROVED EQUAL.
14. DETAIL SHOWS FLANGE-BY-FLANGE JOINT CONNECTION OF PIPE AND FITTINGS. MJ FITTINGS SHALL BE ALLOWED IF THE JOINT AT THE FITTINGS CAN BE ADEQUATELY RESTRAINED.

ST. TAMMANY PARISH GOVERNMENT

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY: DAC
DRAWN BY: GFJ
CHECKED BY: TAA
SUBMITTED BY: DAC
PROJECT No.: TU23000171
TU23000175
ISSUE DATE: 05/2024
APPROVED BY: TAA
SHEET SIZE: ANSI D
SCALE: N.T.S.

STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26372
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

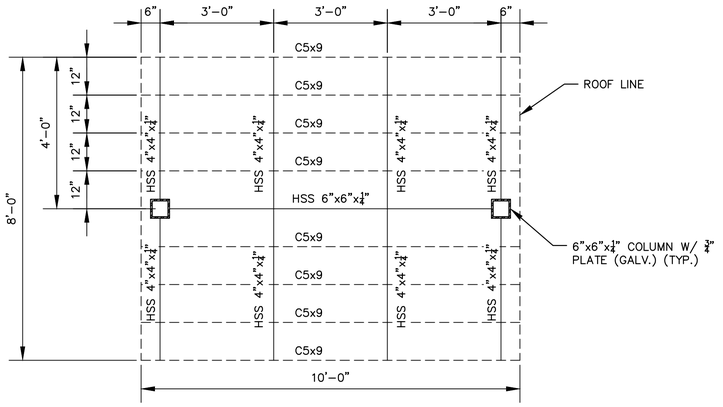
POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

SEWER STANDARD DETAILS
SEWER FORCE MAINS

SHEET NO.
C-513
SHEET 31 of 42

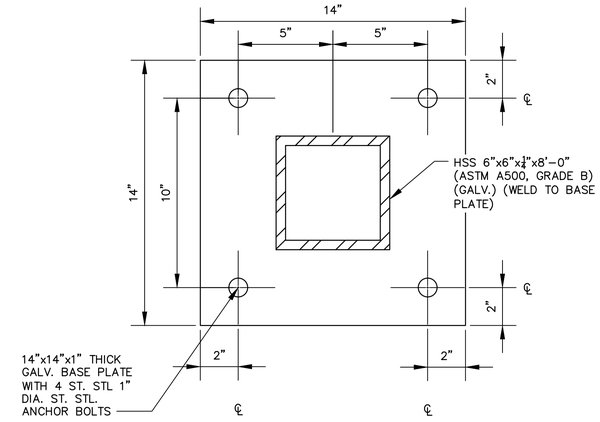
G:\11707\06 ISSUED FOR BID REVISED\31_11707_C-513_SewerStandardDetails.dwg [C-513] Jun 18, 2024 - 3:19pm by hbethea

NOTE:
ELECTRICAL EQUIPMENT RACK FOR POST OAK LIFT STATION AND FAUBOURG LIFT STATION



ELECTRICAL EQUIPMENT RACK–ROOF PLAN

SCALE: 1/2" = 1"

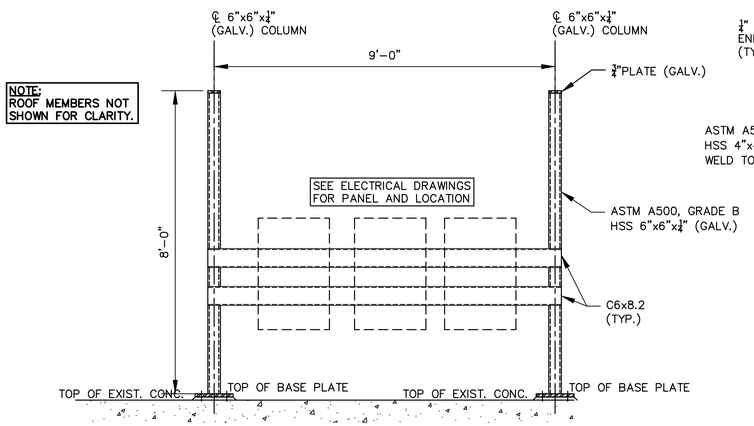


BASE PLATE DETAIL – PLAN

SCALE: 3" = 1'-0"

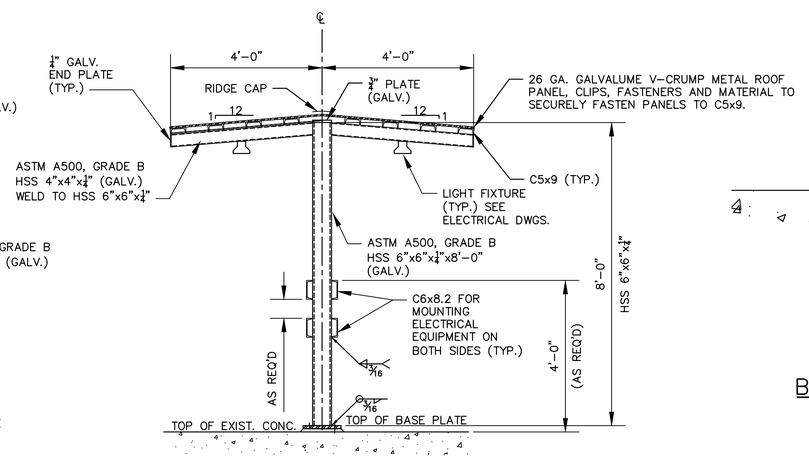
NOTE:
GALV. STRUCTURAL MEMBERS ALL WELDED CONSTRUCTION UNLESS OTHERWISE NOTED.

NOTE:
ROOF MEMBERS NOT SHOWN FOR CLARITY.



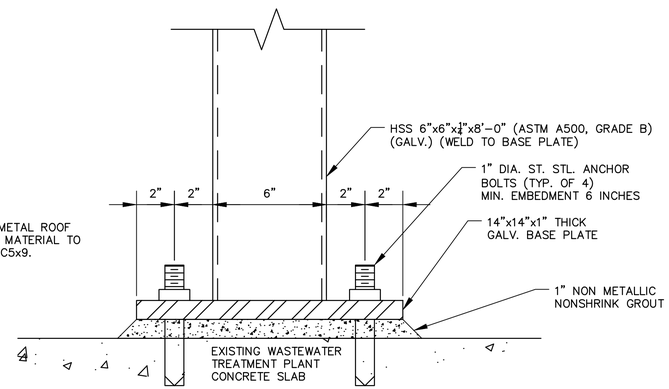
ELECTRICAL EQUIPMENT RACK–SIDE VIEW

SCALE: 1/2" = 1"



ELECTRICAL EQUIPMENT RACK–END VIEW

SCALE: 1/2" = 1"



BASE PLATE DETAIL – SECTION

SCALE: 3" = 1'-0"

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

No.	DESCRIPTION OF REVISION	DATE:

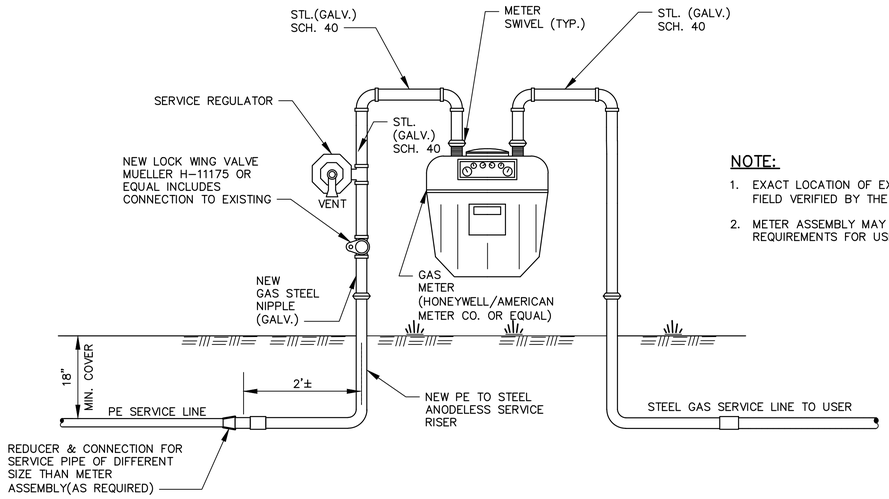
DESIGNED BY:	DAC
DRAWN BY:	GFJ
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	N.T.S.

STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26372
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

ELECTRICAL EQUIPMENT RACK AND BASE PLATE DETAILS

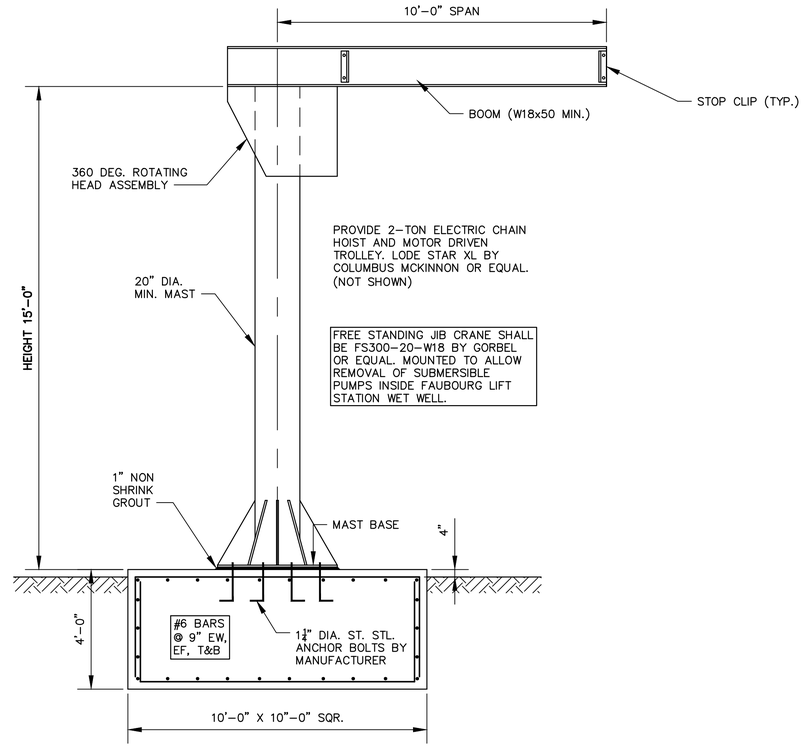
SHEET NO.
C–514
SHEET 32 of 42



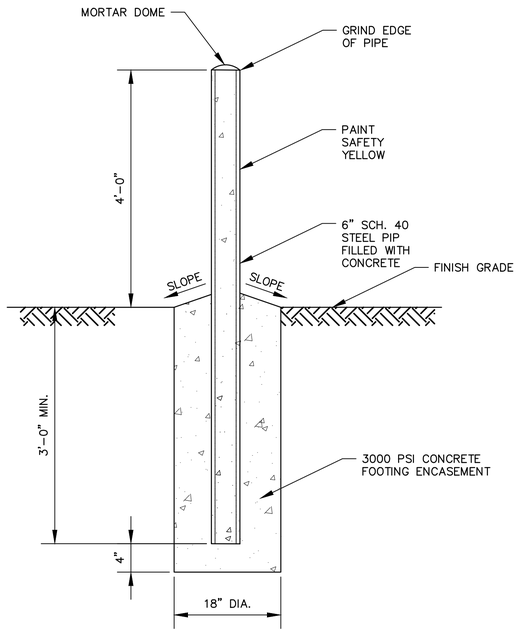
NOTE:

1. EXACT LOCATION OF EXIST. METER ASSEMBLY TO BE FIELD VERIFIED BY THE CONTRACTOR. (NO DIRECT PAY)
2. METER ASSEMBLY MAY VARY PER GAS COMPANY REQUIREMENTS FOR USER.

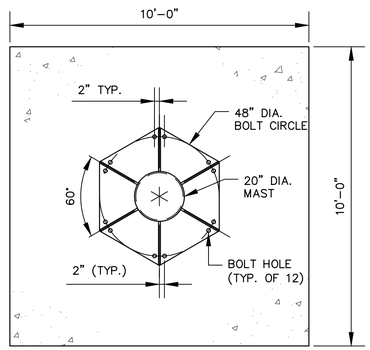
GAS METER ASSEMBLY
N.T.S.



BASE PLATE MOUNTED FREE STANDING JIB CRANE
N.T.S.



6" GUARD POST DETAIL
N.T.S.



FREE STANDING JIB CRANE CONCRETE FOUNDATION - PLAN
N.T.S.

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

No.	DESCRIPTION OF REVISION	DATE:

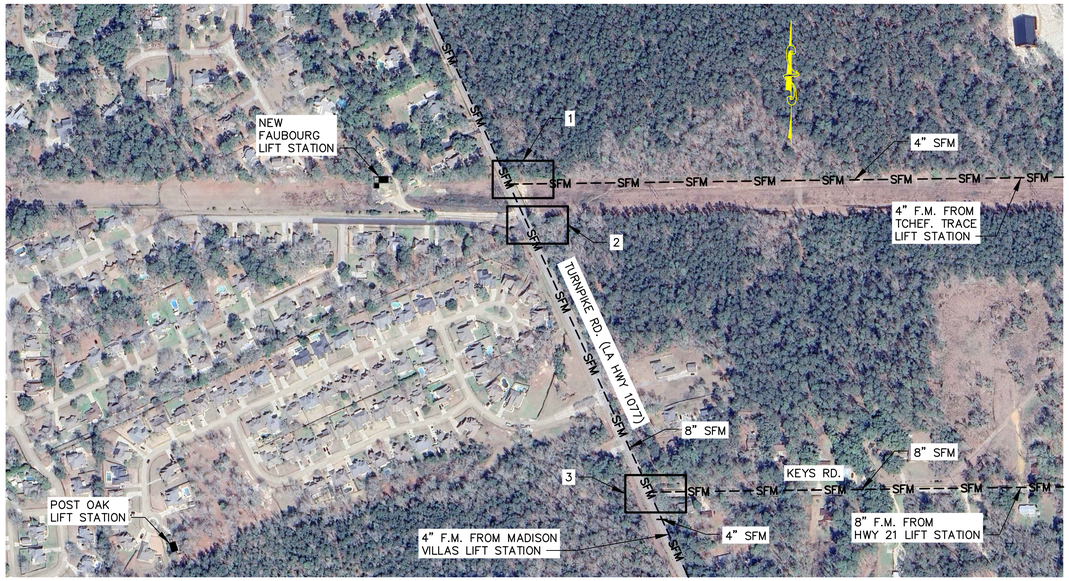
DESIGNED BY:	DAC
DRAWN BY:	GFJ
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	N.T.S.

DAVID A. COLSON
REG. No. 26372
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
STATE OF LOUISIANA
May 22, 2024

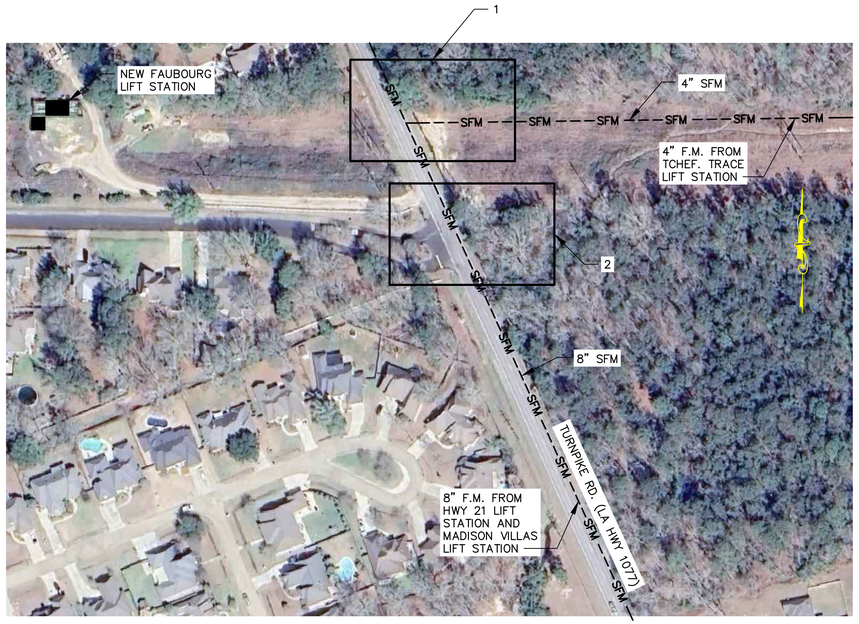
POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

MISCELLANEOUS DETAILS

SHEET NO.
C-515
SHEET 33 of 42



EXPLORATORY INVESTIGATION SITES



SITE NO. 1 AND SITE NO. 2

SITE NO. 3

GENERAL NOTES:

1. EXPLORATORY INVESTIGATION SITE NO. 1 AND SITE NO. 2

THE PURPOSE OF THIS INVESTIGATION IS TO DETERMINE THE LOCATION OF THE EXISTING TECHEFUNTE TRACE LIFT STATION SANITARY FORCE MAIN (4–INCH DIAMETER) CONNECTION TO AN EXISTING 8–INCH DIAMETER SANITARY FORCE MAIN ALONG LA HIGHWAY 1077 AND RELOCATE TO INFLUENT OF FAUBOURG LIFT STATION.

EXPLORATORY INVESTIGATION SITE NO. 3.

THE PURPOSE OF THIS INVESTIGATION IS TO DETERMINE THE LOCATION OF THE EXISTING MADISON VILLA LIFT STATION SANITARY FORCE MAIN (4–INCH DIAMETER) CONNECTION TO AN EXISTING 8–INCH DIAMETER SANITARY FORCE MAIN FROM THE LA HIGHWAY NO. 21 LIFT STATION.

2. THE CONTRACTOR SHALL EXPOSE THE SUBSURFACE UTILITIES AND PROVIDE TYPE, SIZE, CONDITION, MATERIAL, DEPTH, AND LOCATION THROUGH NONDESTRUCTIVE OR MINIMALLY INTRUSIVE EXCAVATION METHODS, EITHER THROUGH VACUUM EXCAVATION, HAND DIGGING, CONVENTIONAL MACHINE EXCAVATION, OR A COMBINATION SUBJECT TO THE APPROVAL OF THE OWNER. FURNISH THIS INFORMATION FOR ALL UTILITIES EXPOSED BY THE EXCAVATION.

3. THE CONTRACTOR SHALL DESIGN AND CONSTRUCT ALL TEMPORARY SHEETING AND BRACING REQUIRED FOR STABILITY OF THE EXCAVATION AND MARK THE EXCAVATION TO MAINTAIN PUBLIC SAFETY AT ALL TIMES. THE EXCAVATION SITE SHALL BE RESTORED TO PRECONSTRUCTION CONDITIONS UPON COMPLETION OF THE INVESTIGATION WORK.

4. HORIZONTAL COORDINATES AS WELL AS VERTICAL ELEVATIONS SHALL BE OBTAINED AND PROVIDED TO THE OWNER. EXPOSED UTILITIES SHALL REMAIN IN SERVICE.

5. THE CONTRACTOR WILL EXCAVATE IN A MANNER TO PROTECT THE EXISTING UTILITIES FROM DAMAGE. THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH REPAIR OF DAMAGED UTILITIES AS RESULT OF THE CONTRACTOR'S OPERATIONS.

6. ALL EXPOSED UTILITIES SHALL BE PROTECTED, SHIELDED, AND SUPPORTED PER THE APPROPRIATE UTILITY OWNER STANDARDS. COORDINATE WITH UTILITY COMPANIES.

7. MEASUREMENT AND PAYMENT: THE COMPLETE WORK WILL BE MEASURED AND PAID FOR AT THE CONTRACT LUMP SUM PRICE PER EACH SITE AS SHOWN ON THE DRAWINGS AND IN THE BID FORM. PAYMENT SHALL INCLUDE ALL THE COSTS ASSOCIATED WITH THE WORK INCLUDING, BUT NOT LIMITED TO, EQUIPMENT, LABOR, MATERIAL, EXCAVATION, BACKFILL, COMPACTION, DEWATERING, PROTECTION, SHIELDING, SUPPORTING, RESTORATION, TRAFFIC CONTROL, CLOSURES, AND OTHER APPROPRIATE WORK TO COMPLETE THE WORK AND VERIFY THE LOCATIONS AND OTHER NECESSARY INFORMATION ABOUT THE EXISTING UTILITIES. CONTRACTOR SHALL ASSUME UP TO TWO FULL (8 HOUR) DAYS AT EACH SITE TO COMPLETE EXPLORATORY DIGGING.

8. LOCATIONS OF FORCE MAINS SHOWN ARE STRICTLY SCHEMATIC IN NATURE.

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	DAC
DRAWN BY:	GFJ
CHECKED BY:	TAA
SUBMITTED BY:	DAC
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	05/2024
APPROVED BY:	TAA
SHEET SIZE:	ANSI D
SCALE:	AS SHOWN

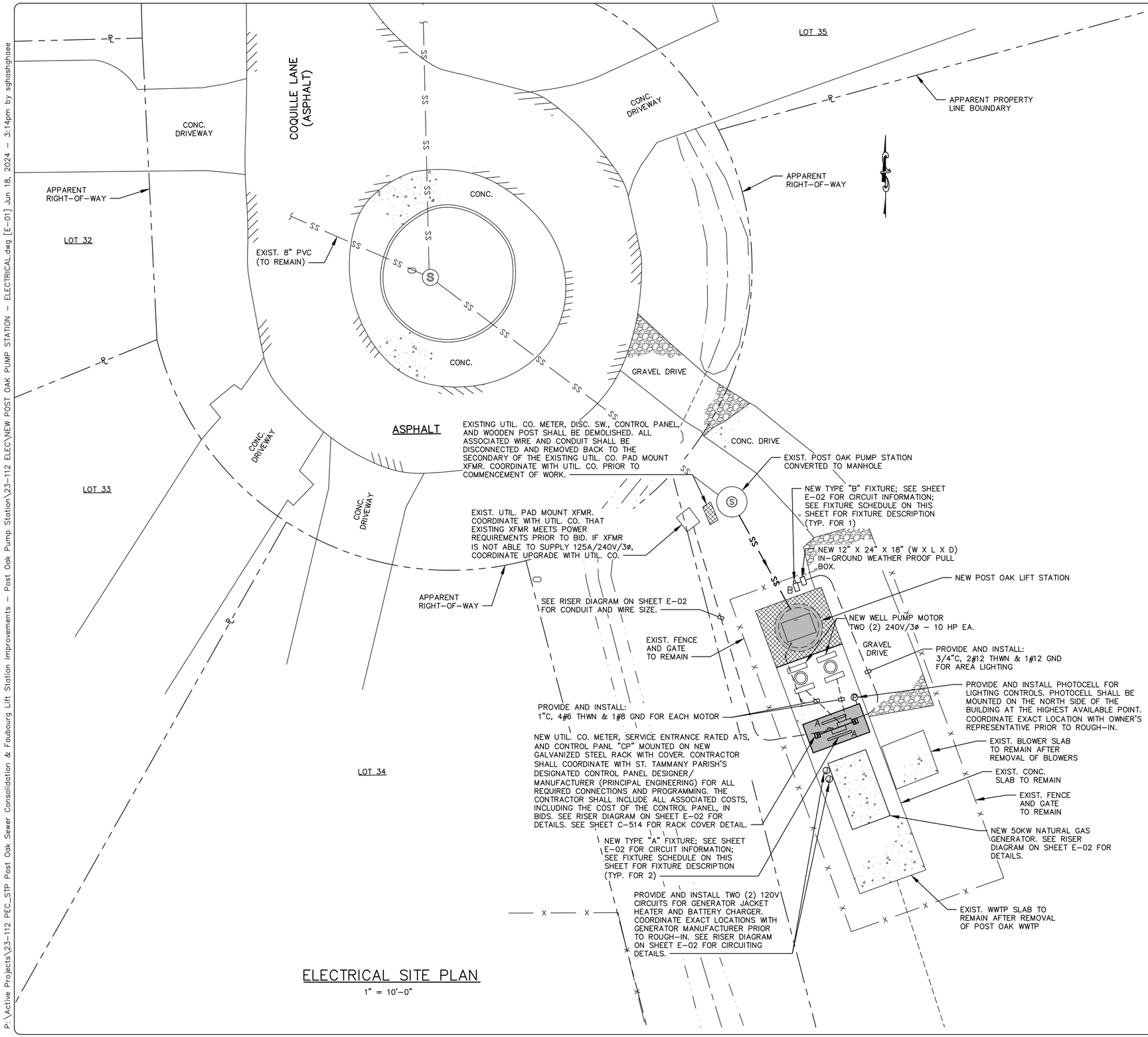
STATE OF LOUISIANA
DAVID A. COLSON
REG. No. 26372
PROFESSIONAL ENGINEER IN CIVIL ENGINEERING
May 22, 2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171 & TU23000175

EXPLORATORY INVESTIGATION LOCATIONS AND PHOTOS

SHEET NO.
C–516
SHEET 34 OF 42

G:\17\707\06 ISSUED FOR BID REVISED\14_11707_C-516_NEW FAUBOURG EXPLORATORY INVESTIGATION.dwg [C-516] Jan 18, 2024 - 3:21pm by Mathes



ELECTRICAL SITE PLAN

1" = 10'-0"

SYMBOL SCHEDULE

	POWER PANEL
	FUSED SAFETY DISCONNECT SWITCH
WP	WEATHERPROOF
	ELECTRICAL CONDUIT ROUTED UNDERGROUND
	GROUND FAULT INTERRUPTER DUPLEX RECEPTACLE
A	LED FIXTURE; "A" DENOTES TYPE
EM	EMERGENCY LIGHTING UNIT

ELECTRICAL GENERAL NOTES

1. ALL ELECTRICAL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE. ALL WORK SHOWN IS NEW UNLESS NOTED OTHERWISE.
2. THE CONDUIT SYSTEM, ALL ELECTRICAL EQUIPMENT, ALL STEEL STRUCTURES, MOTOR FRAMES, ETC. SHALL BE CONNECTED TO THE GROUNDING SYSTEM PER ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE.
3. ALL EQUIPMENT LOCATIONS SHALL BE VERIFIED IN THE FIELD WITH MECHANICAL TRADES, CONDUIT ROUTING AND EQUIPMENT LOCATIONS SHOWN ARE DIAGRAMMATIC ONLY. THE EXACT LOCATION OF ALL EQUIPMENT AND ROUTING OF CABLES SHALL BE COORDINATED WITH & APPROVED BY ST. TAMMANY PARISH'S REPRESENTATIVE DURING CONSTRUCTION.
4. LOCATIONS OF CONDUITS, BOXES, FITTINGS, ETC., ARE DIAGRAMMATIC. IT SHALL BE THE ELECTRICAL CONTRACTORS RESPONSIBILITY TO VERIFY ALL SIZES AND LOCATIONS. REVIEW ALL MECHANICAL SHOP DRAWINGS AND COORDINATE WITH THE MECHANICAL CONTRACTOR, OWNER, AND ENGINEER TO INSURE THE TIMELY DELIVERY AND PROPER INSTALLATION OF ALL ELECTRICAL EQUIPMENT. (I.E. CONTROL PANELS, AREA LIGHTING, ETC.)
5. BEFORE INSTALLATION, THE ELECTRICAL CONTRACTOR SHALL SUBMIT DETAILED LAYOUT DRAWINGS TO THE ENGINEER FOR REVIEW COVERING PROPOSED LOCATIONS, MOUNTING, AND ROUTING FOR ALL CONDUITS, SERVICES, FITTINGS, GROUND RODS, AREA LIGHTING, CONTROL PANELS, SUPPORTS, ETC.
6. ENCLOSURE, JUNCTION BOXES, RECEPTACLES AND ALL OTHER ELECTRICAL EQUIPMENT USED OUTDOOR SHALL BE OF NEMA 4X (STAINLESS STEEL) CONSTRUCTION UNLESS OTHERWISE NOTED.
7. MINIMUM CONDUIT SIZE IS 3/4". ALL EXPOSED CONDUIT SHALL BE RIGID STEEL AND ALL DUCT BANK CONDUIT SHALL BE SCHEDULE 40PVC UNLESS NOTED OTHERWISE.
8. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE MECHANICAL CONTRACTOR AND CAREFULLY REVIEW THE MECHANICAL PACKAGES PROPOSED TO BE SUPPLIED. IT SHALL BE THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO INSURE THAT ALL WIRE AND CONDUIT NEEDED FOR ELECTRICAL APPURTENANCES, ASSOCIATED WITH MECHANICAL PACKAGES, ARE PROVIDED EVEN IF NOT SPECIFICALLY CALLED FOR IN THE PLANS AND SPECIFICATIONS.
9. THERE SHALL BE WARNING LABELS LOCATED ON THE FRONT OF EACH ELECTRICAL ENCLOSURE. SEE SIGNAGE DETAIL ON SHEET E-02.
10. CONTRACTOR SHALL COORDINATE ALL ASPECTS OF NEW SERVICE, INCLUDING LEAD TIMES, WITH UTILITY COMPANY AND INCLUDE ALL COSTS IN BID.
11. WARNING TAPE SHALL BE INSTALLED 12 TO 18 INCHES BELOW GRADE OVER ALL CONDUITS.
12. PROVIDE 1/4" MINIMUM DIAMETER PULL ROPE. PULL ROPE SHALL NOT BE NYLON STRING.
13. FOR SERVICE ENTRANCE CONDUITS, UTILIZE LONG RADIUS (36") CONDUIT BENDS.
14. ALL CONDUIT RISERS FROM UNDERGROUND SHALL HAVE RIGID METAL ELLS AND RISERS.
15. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES. AVOID DISTURBANCE OF EXISTING UTILITIES NOT INCLUDED IN THIS PROJECT.
16. SETSCREW CONDUIT FITTINGS SHALL NOT BE PERMITTED.
17. CONTRACTOR SHALL MAKE ALL NECESSARY INTERCONNECTIONS BETWEEN CONTROL PANELS AND EQUIPMENT FURNISHED BY OTHERS AS INSTRUCTED BY THE SUPPLIER OF SUCH EQUIPMENT. COORDINATE WITH THE EQUIPMENT SUPPLIER PRIOR TO BIDDING AND INCLUDE ALL ASSOCIATED COSTS IN BIDS.
18. COORDINATE SCOPE OF DEMOLITION WITH THE CIVIL DRAWINGS AND INCLUDE ALL ASSOCIATED COSTS IN BIDS.

FIXTURE SCHEDULE

A 4' LED VAPORTIGHT FIXTURE, POLYCARBONATE HOUSING, SURFACE MOUNT, 4,000 LUMENS, 4000K, 120 VOLT: LITHONIA LIGHTING #CSVT-L48-ALO3-MVOLT-SWW3-80CRI; FAIL-SAFE #4VRVT3-LD5-4-G-UNV-L840-CD1-U; OR PRIOR APPROVED EQUAL

B LED AREA LIGHTING FIXTURE WITH HOUSESIDE SHIELD, DIE-CAST ALUMINUM HOUSING, POLE MOUNT, 20,800 LUMENS, 4000K, 120 VOLT: LITHONIA LIGHTING #DSX1-LED-P6-40K-70CRI-TFTM-MVOLT-SPA5-HS; BEACON #RAR2-320L-165-4K7-4F-UNV-ASQ; OR PRIOR APPROVED EQUAL

PARISH ENGINEERING
7600 Innovation Park Drive
Baton Rouge, LA 70820
(225)332-0222
parisheng.com | #23-112

ST. TAMMANY PARISH GOVERNMENT

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	CC
DRAWN BY:	CC
CHECKED BY:	SG
SUBMITTED BY:	MT
PROJECT No.:	TU23000171 & TU23000175
ISSUE DATE:	06/2024
APPROVED BY:	MT
SHEET SIZE:	ANSI D
SCALE:	AS SHOWN

STATE OF LOUISIANA
MICHAEL TERRY LEVY III
LICENSED PROFESSIONAL ENGINEER
IN
ELECTRICAL ENGINEERING
06/18/2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

NEW POST OAK LIFT STATION - ELECTRICAL SITE PLAN

SHEET NO.
E-01
SHEET 35 of 42

P:\Active Projects\23-112 PEC_STP Post Oak Sewer Consolidation & Faubourg Lift Station Improvements - Post Oak Pump Station\23-112 ELEC\NEW POST OAK PUMP STATION - ELECTRICAL.dwg [E-01] Jun 18, 2024 - 3:14pm by sghashghaee

TYPICAL PANELBOARD PLAQUE

(INDICATE PANEL DESIGNATION)
__/__ VOLTS __ PHASE __ WIRE
___ AMPS MAIN ___
FED FROM
(INDICATE FEEDER ORIGINATION I.D.)
(PANEL AND CIRCUIT NO.)

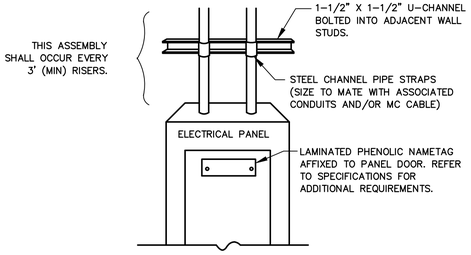
TYPICAL DISCONNECT PLAQUE

(INDICATE EQUIPMENT DESCRIPTION)
FUSED AT ___ AMPERES
FED FROM
(INDICATE FEEDER ORIGINATION I.D.)
(PANEL AND CIRCUIT NO.)

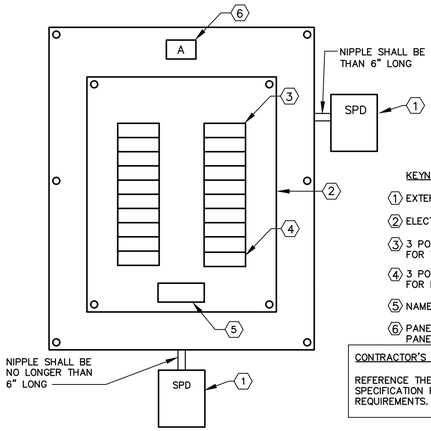
SIGNAGE NOTES:
SEE SPECIFICATIONS FOR MATERIALS, COLORS SIZE LETTERING, ETC.

ATTACH PLAQUES USING INDUSTRIAL GRADE DOUBLE FACE ADHESIVE.

EQUIPMENT SIGNAGE DETAIL
NOT TO SCALE



CONDUIT SUPPORT DETAIL
NOT TO SCALE



VERTICAL ORIENTATION

KEYNOTES
1. EXTERNALLY INSTALLED SPD.
2. ELECTRICAL PANEL.
3. 3 POLE CIRCUIT BREAKER POSITION FOR TOP MOUNTED SPD.
4. 3 POLE CIRCUIT BREAKER POSITION FOR BOTTOM MOUNTED SPD.
5. NAMEPLATE.
6. PANEL NAME AS PER PROJECT PANEL.

CONTRACTOR'S ATTENTION:
REFERENCE THE "SURGE PROTECTION DEVICE" SPECIFICATION FOR ADDITIONAL INSTALLATION REQUIREMENTS.

SIGNAGE:
1) THE BELOW SIGN SHALL BE MOUNTED ON THE FRONT OF ALL ELECTRICAL ENCLOSURES.

1/16" THICK

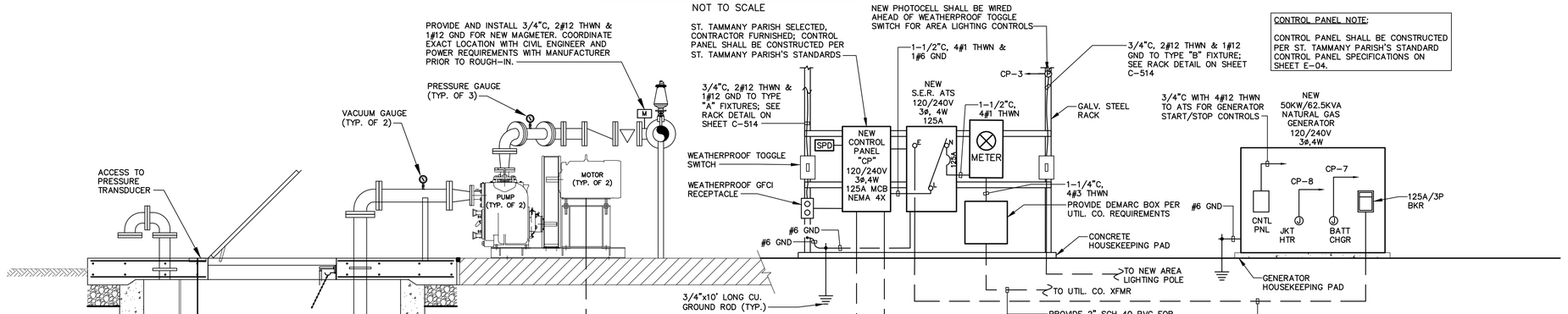
WARNING!
DISCONNECT POWER PRIOR TO WORKING WITHIN THIS ENCLOSURE

THIS EQUIPMENT CAN ONLY BE SERVICED BY QUALIFIED PERSONNEL

SIGNAGE NOTES:
1. NAMEPLATES TO BE FABRICATED FROM LAMACOID PLASTIC WITH BLACK OUTER LAMINATION AND A WHITE INNER LAMINATION.
2. LETTERING SHALL BE 1/4" HIGH CAPS, EXCEPT AS NOTED ON SCHEDULE. ENGRAVE LETTERS TO EXPOSE WHITE LAMINATION.
3. ATTACH NAMEPLATES ON EQUIPMENT IN A PROMINENT PLACE. USE TWO (2) SMALL SHEET METAL SCREWS FOR SHEET METAL ENCLOSURES. USE CONTACT BOND CEMENT ON ALL OTHER TYPE ENCLOSURES. ASSURE THAT SURFACE IS CLEAN AND FREE OF PAINT.

SIGNAGE DETAIL
NOT TO SCALE

SPD INSTALLATION DETAIL
NOT TO SCALE



ELECTRICAL RISER DIAGRAM
NOT TO SCALE

PANEL "CP"

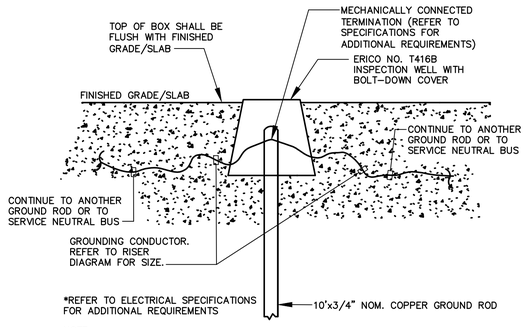
TYPE: BOLT-ON BREAKER PANELBOARD *MOUNTING:* SURFACE
SERVICE: 120/240 VOLT, 3ø, 4W *AIC:* 22,000
MAIN: 125 AMP MCB *REMARKS:* GROUND BUS

bkr. no.	trip amp	bkr. pole	wire size	cd	service
1	60	3	6	3/4"	PUMP #1 (10 HP)
2	60	3	6	3/4"	PUMP #2 (10 HP)
3	20	1	12	3/4"	RECEPTACLE/PHOTOCELL/LIGHTING
4	20	1			SCADA PANEL (FUTURE)
5	20	1	12	3/4"	CONTROL POWER
6	20	1	12	3/4"	MAGMETER
7	20	1	12	3/4"	GEN. BATTERY CHARGER
8	20	1	12	3/4"	GEN. JACKET HEATER
9	20	1			SPARE
10	60	3	6	1"	EXTERNAL SPD
11-12	–	1			SPACE

NOTES:
1. PROVIDE PLAQUE IDENTIFYING HIGH LEG OF PANEL.
2. PROVIDE 1/2"C, 3#14 THWN FOR EACH PRESSURE AND VACUUM GAUGE AND CONNECT TO THE CONTROL PANEL (PANEL "CP") FOR MONITORING. CONTROL PANEL SHALL PROVIDE 24 VDC POWER TO GAUGES. COORDINATE WITH THE GAUGE SUPPLIER PRIOR TO BIDDING.

LOAD SUMMARY

ITEM	CONNECTED LOAD (VOLT-AMPS)			DEMAND LOAD (VOLT-AMPS)
LIGHTING	233	X	125% =	292
RECEPTACLES	180			
(First 10,000 Watts)	180	X	100% =	180
(Remaining Watts)	0	X	50% =	0
LARGEST MOTOR (10 HP)	11,640	X	125% =	14,549
MOTORS (remaining)	11,640	X	100% =	11,640
MISC. (Control power, SCADA, etc.)	5,225	X	100% =	5,225
TOTAL				31,886 VA
AMPERAGE (AT 240V/3ø) :				76.7 A



NOTE:
SUBMIT DIGITAL PHOTOS OF ALL GROUNDING TERMINATIONS

GROUND ROD INSTALLATION DETAIL
SCALE: NOT TO SCALE

PARISH ENGINEERING
7600 Innovation Park Drive
Baton Rouge, LA 70820
(225)332-0222
parisheng.com | #23-112

ST. TAMMANY PARISH GOVERNMENT

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY: CC
DRAWN BY: CC
CHECKED BY: SG
SUBMITTED BY: MT
PROJECT No.: TU23000171 TU23000175
ISSUE DATE: 06/2024
APPROVED BY: MT
SHEET SIZE: ANSI D
SCALE: AS SHOWN

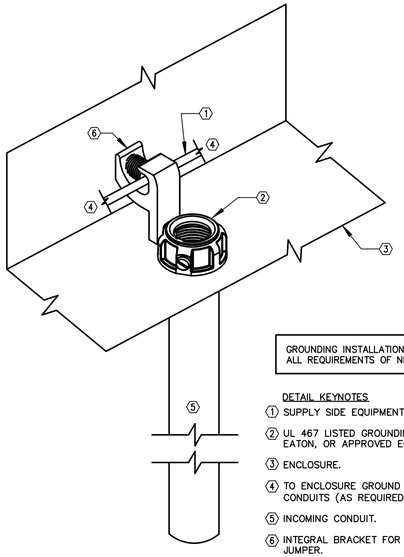
STATE OF LOUISIANA
MICHAEL TERRY
LICENSED PROFESSIONAL ENGINEER
06/18/2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171 & TU23000175

NEW POST OAK LIFT STATION - RISER DIAGRAM, SCHEDULE, & DETAILS

SHEET NO.
E-02
SHEET 36 of 42

P:\Active Projects\23-112 PEC_STP Post Oak Sewer Consolidation & Faubourg Lift Station Improvements - Post Oak Pump Station\23-112 ELEC\NEW POST OAK PUMP STATION - ELECTRICAL.dwg [E-02] Jun 18, 2024 - 3:16pm by sghashghaee



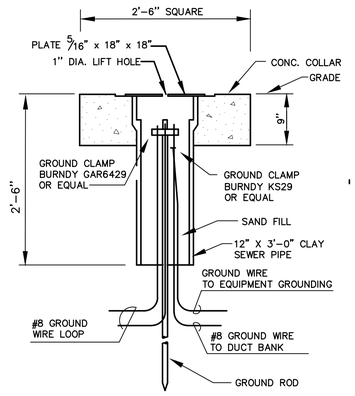
GROUNDING INSTALLATION SHALL MEET ALL REQUIREMENTS OF NEC 250.92.

DETAIL KEYNOTES

1. SUPPLY SIDE EQUIPMENT BONDING JUMPER.
2. UL 467 LISTED GROUNDING BUSHING BY APPLETON, EATON, OR APPROVED EQUIVALENT.
3. ENCLOSURE.
4. TO ENCLOSURE GROUND BUS OR ADDITIONAL CONDUITS (AS REQUIRED).
5. INCOMING CONDUIT.
6. INTEGRAL BRACKET FOR ATTACHMENT OF BONDING JUMPER.

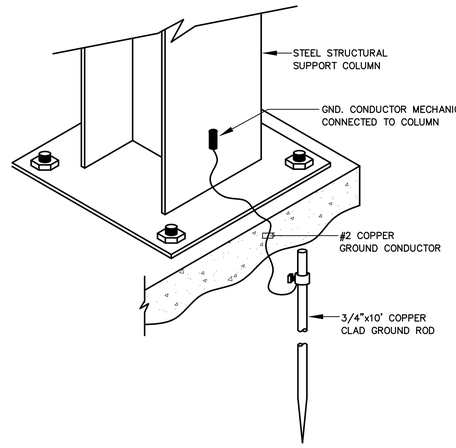
CONDUIT GROUND BUSHING

NOT TO SCALE



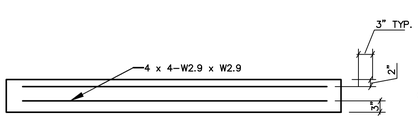
GROUNDWELL DETAIL

NOT TO SCALE



SUPPORT RACK STEEL GROUNDING DETAIL

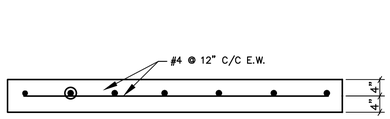
NOT TO SCALE



WEB REINFORCEMENT

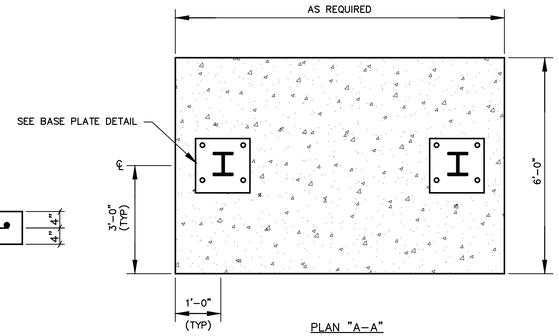
NOT TO SCALE

OR



REBAR

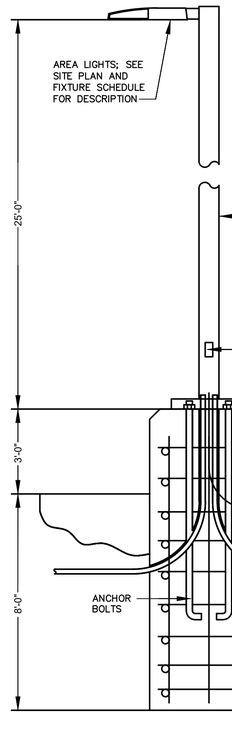
NOT TO SCALE



PLAN "A–A"

CONCRETE PAD

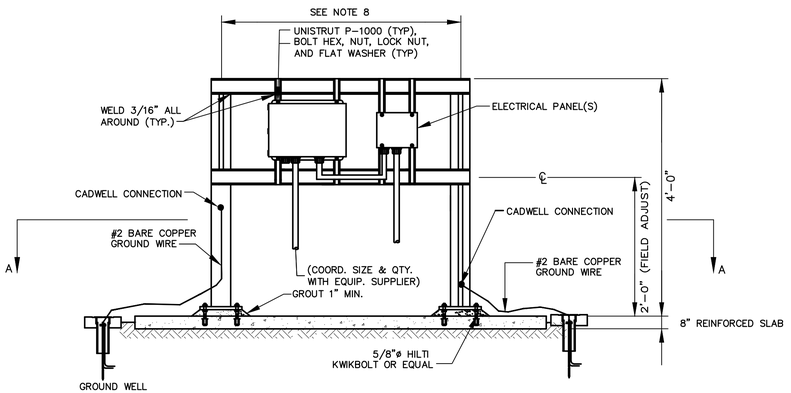
NOT TO SCALE



AREA LIGHTING POLE DETAIL

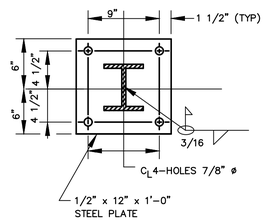
NOT TO SCALE

THIS DETAIL IS INTENDED TO SHOW TYPICAL EQUIPMENT MOUNTING TECHNIQUES. ALL EQUIPMENT IS NOT SHOWN FOR CLARITY.



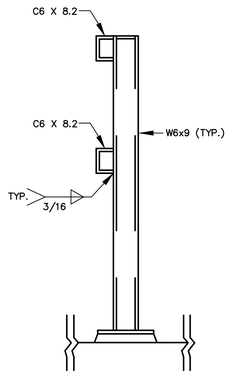
ELEVATION VIEW

NOT TO SCALE



BASE PLATE DETAIL

NOT TO SCALE



SIDE VIEW

NOT TO SCALE

SWITCH RACK NOTES:

1. VERIFY ALL DIMENSIONS BEFORE FABRICATION.
2. REMOVE BURRS AND GRIND SHARP CORNERS AND EDGES. TOUCH UP AS REQUIRED AFTER WELDING AND DRILLING.
3. FIELD GROUT UNDER BASE PLATE.
4. ANCHOR BOLTS SHALL BE 4 INCH IN CONCRETE AND SHALL BE PROVIDED WITH HEX NUTS AND WASHERS.
5. ALL ALUMINUM SHALL BE 6061.
6. MINIMUM CONCRETE STRENGTH SHALL BE 3000 PSI.
7. MAXIMUM OF 6 FEET BETWEEN SUPPORT COLUMNS.
8. ALL UNISTRUT SHALL BE ALUMINUM TYPE.

TYP. ELECTRIC SWITCH RACK DETAIL

NOT TO SCALE

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	CC
DRAWN BY:	CC
CHECKED BY:	SG
SUBMITTED BY:	MT
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	06/2024
APPROVED BY:	MT
SHEET SIZE:	ANSI D
SCALE:	AS SHOWN

STATE OF LOUISIANA — MICHAEL THOMAS CERRY — 34112 — REGISTERED PROFESSIONAL ENGINEER — IN — CIVIL ENGINEERING — 06/18/2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

NEW POST OAK LIFT STATION – ELECTRICAL DETAILS

SHEET NO.
E–03
SHEET 37 of 42

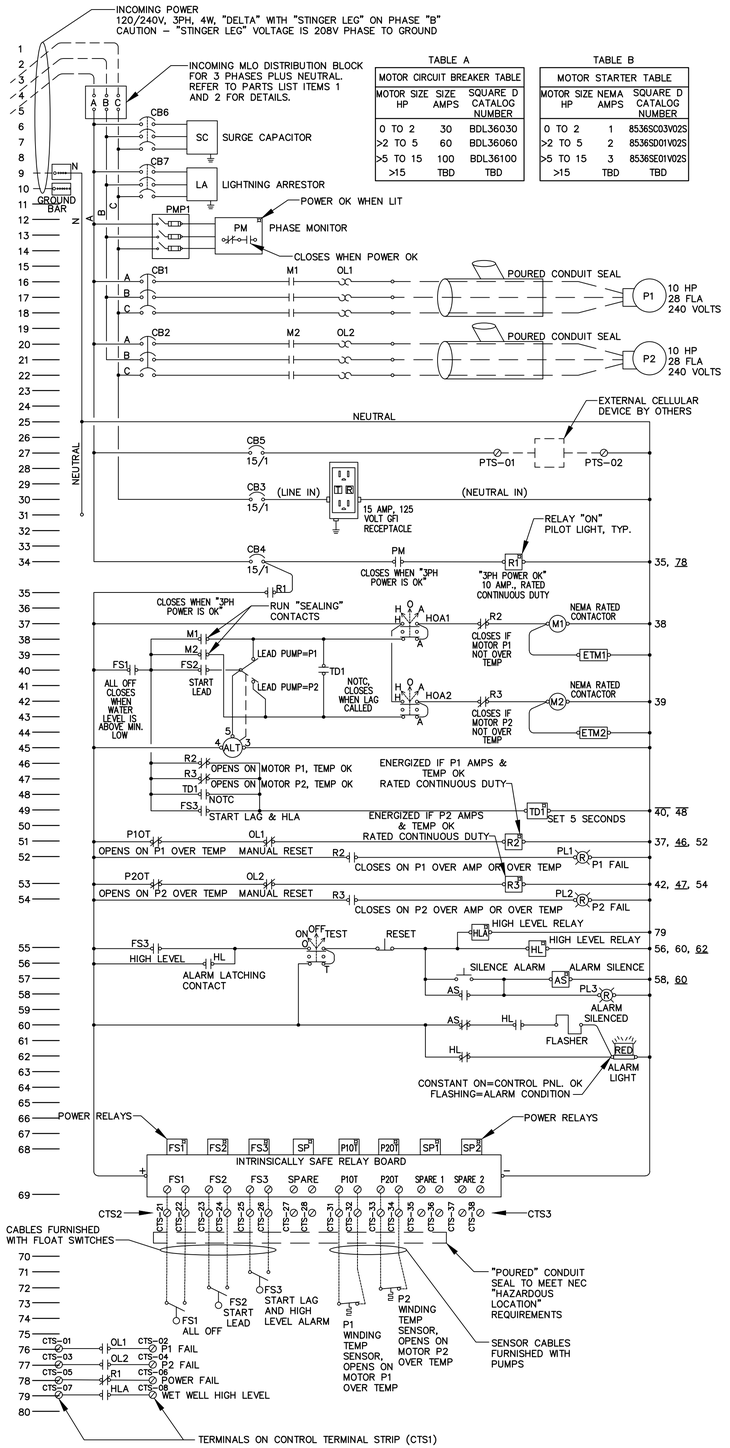
PARISH ENGINEERING
7600 Innovation Park Drive
Baton Rouge, LA 70820
(225)332-0222
parisheng.com | #23-112

ELECTRICAL GENERAL NOTES

1. ALL PANEL ITEMS SHALL BE MOUNTED ON THE BACKPLANE EXCEPT AS NOTED OTHERWISE. ITEMS TO BE MOUNTED ON THE INNER DOOR FRONT ARE ALL PILOT LIGHTS, SELECTOR SWITCHES, PUSHBUTTONS, STARTER RESETS, AND CIRCUIT BREAKER HANDLE OPENINGS. THE ALARM SILENCE PUSHBUTTON SHALL BE MOUNTED ON THE TOP.
2. PANEL ENCLOSURE SHALL BE 36"W x 48"H x 12"D, NEMA 4X TYPE 304 STAINLESS STEEL, WITH HASPS ON 3 SIDES, RAISED LIP ON ENCLOSURE TO RECEIVE DOOR GASKET, WHITE STEEL BACKPLANE, DEAD FRONT INNER DOOR WITH ¼ TURN KNURLED KNOB FASTENING, BOND BOTH DOORS TO ENCLOSURE GROUND STRIP.
3. NOMENCLATURE LABELS FOR ALL ITEMS SHALL BE RED FIELD WITH WHITE CHARACTERS, ENGRAVED LAMINATED NAMEPLATES ATTACHED WITH STAINLESS STEEL MACHINE SCREWS AND NUTS. ALL TEXT SHALL BE MINIMUM ⅜" HIGH.
4. ALL PROPOSED CONTROL PANELS SHALL BE SUBMITTED TO THE PARISH FOR APPROVAL PRIOR TO FABRICATION.
5. THE NAME OF ANY MANUFACTURER, BRAND OR MAKE LISTED ON THE DRAWING IS FOR THE PURPOSE OF ESTABLISHING A MINIMUM ACCEPTABLE STANDARD OF QUALITY DESIRED BY THE PARISH. ALL PRODUCTS BID MUST HAVE PRIOR APPROVAL AS "PRIOR APPROVED EQUIVALENTS".

PARTS LIST FOR 120/240 VOLT CONTROL PANEL

1. INCOMING MAIN POWER DISTRIBUTION BLOCK – BLACK PHENOLIC, 3 POLE, 380 AMP, 600VOLT, 100KA WITHSTAND RATING WITH RK5 FUSE PROTECTION, FINGER SAFE GUARDS.
   A. INCOMING WIRE RANGE – 1 PRIMARY PORT PER POLE, #4 TO #500 KCMIL.
   B. DISTRIBUTION WIRE RANGE AND NUMBER – SIX SECONDARY PORTS PER POLE, #14 TO #2/0.
   C. MFGR/CAT#: SQUARE D #9080LBA365106, DIMS.: DXHXW=3.1"X5.5"X8.5", WITH CLEAR COVER #9080LB53.
2. NEUTRAL BLOCK – 380 AMP, BLACK PHENOLIC, 1P, 380 AMP, 600VOLT, 100KA WITHSTAND RATING, ISOLATED, FINGER SAFE GUARD.
   A. INCOMING WIRE RANGE – 1 PRIMARY PORT PER POLE, #4 TO #500 KCMIL.
   B. DISTRIBUTION WIRE RANGE AND NUMBER – SIX SECONDARY PORT.
   C. MFGR/CAT#: SQUARE D #9080LBA165106, DIMS: DXHXW=3.1"x5.5"x3.2", WITH CLEAR COVER #9080LB51.
3. GROUND TERMINAL STRIP – 20 POSITION, #6 WIRE MAX., MOUNT TO BACKPLANE.
4. SURGE CAPACITOR – RATED VOLTAGE 650V, 3 PHASE, 4 WIRE, DELTA # CA–603
5. LIGHTING ARRESTOR – 600 VOLTS MAX., DELTA TYPE SERVICE, 3 POLE, 4 WIRE, RATED 40KA SURGE PER PHASE, MOUNT ON BRACKET INSIDE CONTROL PANEL. SQUARE D # SDSA3650D, OR DELTA #LA–303.
6. PMP1 PHASE MONITOR PROTECTOR – 3 POLE PHENOLIC FUSE HOLDER FUSE HOLDER WITH 3 – 5 (FIVE) AMP 250 VOLT CLASS R FUSES. SQUARE D #FB3211R.
7. PHASE MONITOR – 3 PHASE, 190–270 VOLT, ADJUSTABLE, WITH GREEN "POWER OKAY" PILOT LIGHT, SPDT 10 AMP RATED CONTACT, UNDERVOLTAGE, PHASE LOSS, PHASE REVERSAL, PLUGIN OCTAL BASE, 8 PIN. RELAY ONLY ALLOWS FOR "A–B–C" ROTATION. DIVERSIFIED ELECTRONINCS # SLA–230–ASA.
8. PHASE MONITOR BASE – 8 PIN OCTAL BASE, (SINGLE STACK), SNAPON DIN RAIL MOUNT, 300 VOLT, 10 AMP. IDEC # SR2P–06.
9. CB1, CB2 – THERMAL–MAGNETIC SQUARE D, 3 POLE, 600 VOLTS, 25 KAIC AT 240V AMPERAGE RATING, BY PUMP MOPTOR HP AS SHOWN IN TABLE A. POWER SHALL BE THROUGH LUGS ON BOTH ENDS.
10. M1, M2 MOTOR STARTER – SQUARE D, FVNR OPEN TYPE, 3 POLE, 600 VOLTS, NEMA SIZE SHOWN IN TABLE B BY PUMP MOTOR HP, 4 NO/NC FORM "C" AUX CONTACTS, 120 VOLT COIL.
11. OL1 AND OL2 "HEATERS" – SQUARE D, BUILT INTO STARTER OL FRAME, MELTING ALLOY TYPE, MANUAL RESET, SELECT BASED ON PUMP MOTOR FLA.
12. GFI RECEPTACLE, 15 AMP, 125 VOLTS, FLUSH MOUNT IN 1G BOX W/ COVER ON BACKPLANE.
13. CB3, THERMAL – MAGNETIC, 15/1, 125 VOLTS, FULL SIZE, 10KAIC, FOR GFI RECEPTACLE, SQUARE D # Q015.
14. CB4, THERMAL – MAGNETIC, 15/1, 125 VOLTS, FULL SIZE, 10KAIC, FOR CONTROLS, SQUARE D # Q015.
15. R1 – 3 POLE "ICE CUBE" RELAY, 120 VOLT AC COIL AND 3PDT CONTACTS, 10 AMP, RATED FOR "CONTINUOUS DUTY", "ON" PILOT LIGHT, 11 PIN OCTAL BASE. IDEC # RR3PA–UL, OR SQUARE D # 8501 KPDR 13P14 V20(SQ D DIGEST PAGE 23–14).
16. R1 SOCKET BASE – 11 PIN OCTAL BASE, (SINGLE STACK), FOR 3 POLE RELAY, SNAPON DIN RAIL MOUNT, 300 VOLT, 10 AMP. IDEC # SR3P–0622, OR SQUARE D # 8501NR61.
17. HOA1, HOA2, 3 POSITION MAINTAINED, METALIC BODY, 22MM DIAMETER, KNOB OPERATOR. LABEL "HAND–OFF–AUTO". SQUARE D HARMONY XB4 METAL, ZB4BD3 (STD BLK 45 DEGREE HANDLE), ZB4BZ105 CONTACT BLOCK (1 NO + 1 NC), 1 ADDITIONAL ZBE505 CONTACT BLOCK (1 NO + 1 NC).
18. ETM1, ETM2, ELAPSED TIME METER, 100000 HOURS, QUARTZ/DIGITAL WITH 1/8" ANALOG NUMBERS, NON–RESETTABLE, 120 VOLTS AC, NEMA 12/4X, RECTANGULAR HOLE PANEL MOUNT, IN DEAD FRONT DOOR PANEL. REDINGTON MODEL 722.
19. ALTERNATOR (ALT) WITH LEAD/LAG/OFF TOGGLE SELECTOR SWITCH, 125 VOLT AC, 1PDT, RATED 10 AMPS" "CONTINUOUS DUTY", REQUIRES 8 PIN OCTAL BASE. TIMEMARK CAT# 261–ST–120.
20. ALT RELAY SOCKET BASE – 8 PIN OCTAL BASE, (SINGLE STACK), SNAPON DIN RAIL MOUNT, 300 V, 10 AMP. IDEC # SR2P–06, OR SQUARE D #8501NR51.
21. TD1 – TIME DELAY RELAY, FOR START LAG PUMP. ANALOG, TIME DELAY ON, ADJUSTABLE 0.1 SEC–600 HOURS, FORM "C" DPDT CONTACTS RATED 10 AMPS RESISTIVE, 7 AMPS INDUCTIVE, PILOT LIGHTS FOR "ON" AND "TIMING", 120 VOLT COIL. IDEC # RTE–P1AF20,OR SQUARE D CAT #JCK11 (0–10 SEC, KNOB ON TOP, SQ D DIGEST PAGE 23–42).
22. TD1 SOCKET BASE, 8 PIN OCTAL BASE, (SINGLE STACK), SNAPON DIN RAIL MOUNT, 300 V, 10 AMP. IDEC # SR2P–06, OR SQUARE D # 8501NR51.
23. R2, R3 – 3 POLE "ICE CUBE" RELAY, 120 VOLT AC COIL AND 3PDT CONTACTS, 10 AMP, RATED FOR "CONTINUOUS DUTY", "ON" PILOT LIGHT, 11 PIN OCTAL BASE. IDEC # RR3PA–UL, OR SQUARE D # 8501 KPDR 13P14 V20 (SQ D DIGEST PAGE 23–14).
24. R2, R3 SOCKET BASE – 11 PIN OCTAL BASE, (SINGLE STACK TERMINALS), 3 POLE SNAPON DIN RAIL MOUNT, 300 VOLT, 10 AMP. IDEC #SR3P=0622, OR SQUARE D #8501NR61.
25. PL1, PL2 – LED TYPE PILOT LIGHTS, 120 VOLT TRANSFORMER INPUT, 22MM RED LENS. LABEL "P1 RUN", "P2 RUN". SQUARE D # XB4BVG4 (ZB4BVG4 [HEAD], ZB4BV043 [BODY]).
26. ON–OFF–TEST SWITCH, METALIC BODY, 22MM DIAMETER, KNOB OPERATOR. LABEL "ON–OFF–TEST". SQUARE D, HARMONY XB4 METAL, ZB4BD3 (STD BLK 45 DEGREE HANDLE), ZB4BZ105 CONTACT BLOCK (1 NO + 1 NC), 1 ADDITIONAL ZBE505 CONTACT BLOCK (1 NO + 1 NC).
27. RESET (ALARM) PUSHBUTTON SWITCH, 22MM, NON–ILLUMINATED, 1 POLE, NC, PUSH TO MOMENTARY OPEN, SPRING RETURN TO CLOSED, 120 VOLTS, 10 AMP RATED, CAP COLOR=BLACK, CAP TEXT=RESET. SQUARE D, HARMONY XB4 METAL CAT# ZB4BH02, ZBE205 CONTACTS BLOCK (1 NO + 1 NC, SPRING RETURN TO NC).
28. HL, HLA – 3 POLE "ICE CUBE" RELAY, 120 VOLT AC COIL AND 3PDT CONTACTS, 10 AMP, RATED FOR "CONTINUOUS DUTY", "ON" PILOT LIGHT, 11 PIN OCTAL BASE. IDEC 3 RR3PA–UL, OR SQUARE D #8501 KPDR 13P14 V20 (SQ D DIGEST PAGE 23–14).
29. HL, HLA SOCKET BASE – 11 PIN OCTAL BASE, (SINGLE STACK TERMINALS), 3 POLE, SNAPON DIN RAIL MOUNT, 300 VOLT, 10 AMP. IDEC # SR3P–0622, OR SQUARE D #8501NR61.
30. ALARM SILENCE PUSHBUTTON SWITCH, 22MM, NON–ILLUMINATED, 1 POLE, 120 VOLTS, 10 AMP RATED, CAP COLOR=RED, CAP TEXT=STOP. SQUARE D, HARMONY XB4 METAL CAT# ZB4BH04, ZBE205 CONTACT BLOCK (1 NO +1 NC, SPRING RETURN TO NC).
31. AS – ALARM SILENCE RELAY, 3 POLE "ICE CUBE" RELAY, 120 VOLT AC COIL AND 3PDT CONTACTS, 10 AMP, RATED FOR "CONTINUOUS DUTY", "ON" PILOT LIGHT, 11 PIN OCTAL BASE. IDEC # RR3PA–UL, OR SQUARE D #8501 KPDR 13P14 V20 (SQ D DIGEST PAGE 23–14).
32. AS SOCKET BASE – 11 PIN OCTAL BASE, (SINGLE STACK TERMINALS), 3 POLE, SNAPON DIN RAIL MOUNT, 300 VOLT, 10 AMP. IDEC #SR3P–0622 OR SQUARE D #8501NR61.
33. PL3 – LED TYPE PILOT LIGHT, 120 VOLT TRANSFORMER INPUT, 22MM BLUE LENS. LABEL "ALARM SILENCED". SQUARE D # XB4BVG6 (ZB4BVG6 [HEAD], ZB4BV063 [BODY]).
34. FLASHER, ADJUSTABLE ON AND OFF INTERVALS, 2 POLES, 120 VOLT AC COIL, 10 AMPS, 8 PIN OCTAL BASE. SQUARE D, CAT# JCK51 (0–10 SEC, 2 KNOBS ON TOP FOR ON_TIME + INTERVAL, SQ D DIGEST PAGE 12–42).
35. FLASER BASE, SQUARE D #8501BR51.
36. RED ALARM LIGHT, LED EXTERIOR, NEMA 4X, 120 VOLT.
37. ISBR– INTRINSICALLY SAFE BARRIER RELAY FOR FLOAT SWITCHES AND FOR MOTOR SAFETIES, 8 CHANNEL, 5 AMPS, 120 VOLTS, COMMON AND SEPARATE OUTPUT RELAY WIRING. IDEC CAT# EB3C–R08A.
38. POWER TERMINAL STRIPS (PTS), 30 AMP, 600 VOLT RATED, 10 TERMINALS (AS NEEDED), BLACK PHENOLIC BODY, MARATHON # 672RZ10.
39. CONTROL TERMINAL STRIPS (CTS), 20 AMP, 300 VOLT RATED, 10 TERMINALS EACH (3X10), BLACK PHENOLIC BODY, MARATHON #601GP10.
40. DIN RAIL, EXTRUDED ALUMINUM, DIN STD. DIMENSIONS, LENGTHS AS REQUIRED. IDEC CAT# BNDN1000, WITH DIN RAIL END STOPS, CAT# BNL5.
41. CB5, THERMAL – MAGNETIC, 15/1, 125 VOLTS, FULL SIZE, 10KAIC, FOR EXTERNAL CELLULAR DEVICE. SQUARE D # Q015.
42. CB6, CB7, – THERMAL–MAGNETIC SQUARE D., 3 POLE, 250 VOLTS, 30 AMP, 22KAIC, SQUARE D # Q0330 VH.



POST OAK CONTROLS

NOT TO SCALE

PARISH ENGINEERING
7600 Innovation Park Drive
Baton Rouge, LA 70820
(225)332-0222
parisheng.com | #23-112

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	CC
DRAWN BY:	CC
CHECKED BY:	SG
SUBMITTED BY:	MT
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	06/2024
APPROVED BY:	MT
SHEET SIZE:	ANSI D
SCALE:	AS SHOWN

STATE OF LOUISIANA – MICHAEL T. BERRY – 29911 – REGISTERED PROFESSIONAL ENGINEER – 06/18/2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

NEW POST OAK LIFT STATION – ELECTRICAL DETAILS

SHEET NO.
E–04
SHEET 38 of 42

P:\Active Projects\23–112 PEC_STP Post Oak Sewer Consolidation & Faubourg Lift Station Improvements – Post Oak Pump Station\23–112 ELEC\NEW POST OAK PUMP STATION – ELECTRICAL.dwg [E–04] Jun 18, 2024 – 3:14pm by sghashghaee

SYMBOL SCHEDULE

	POWER PANEL
	FUSED SAFETY DISCONNECT SWITCH
WP	WEATHERPROOF
	ELECTRICAL CONDUIT ROUTED UNDERGROUND
GFI	GROUND FAULT INTERRUPTER DUPLEX RECEPTACLE
A	LED FIXTURE; "A" DENOTES TYPE
EM	EMERGENCY LIGHTING UNIT

SYMBOL LEGEND

- ABC 123 — DOOR/DEADFRONT MOUNTED DEVICE
- ABC — BACKPLATE MOUNTED DEVICE
- ABC 123 — BACKPLATE MOUNTED DEVICE
- JB — JUNCTION BOX
- PDB — POWER DISTRIBUTION BLOCK
- ABC — SCADA EQUIPMENT
- GROUND
- NF — NON-FUSED DISCONNECT SWITCH

COMPONENT LEGEND

- SPD — SURGE SUPPRESSION DEVICE – SEE COMPONENT SPECIFICATIONS
- PM — PHASE MONITOR – SEE COMPONENT SPECIFICATIONS
- QC — QUADRAPLEX PUMP CONTROLLER – SEE COMPONENT SPECIFICATIONS
- VFD — VARIABLE FREQUENCY DRIVE – SEE COMPONENT SPECIFICATIONS
- LR — LINE REACTOR – SEE COMPONENT SPECIFICATIONS
- QCAT — ALARM TELEMETRY MODULE – SEE COMPONENT SPECIFICATIONS
- MM — MOTOR MONITOR – SEE COMPONENT SPECIFICATIONS
- CT — CURRENT TRANSFORMER – SEE COMPONENT SPECIFICATIONS
- FDC — VARIABLE FREQUENCY DRIVE CONTROLLER – SEE COMPONENT SPECIFICATIONS
- LMC — LEVEL METER CONTROLLER – SEE COMPONENT SPECIFICATIONS
- LF — ANALOG SIGNAL LINE FILTER – SEE COMPONENT SPECIFICATIONS
- LT — LEVEL TRANSMITTER – SEE COMPONENT SPECIFICATIONS
- F — FLOAT SWITCH – SEE COMPONENT SPECIFICATIONS
- TH — THERMOSTAT – SEE COMPONENT SPECIFICATIONS
- CF — EXHAUST FAN – SEE COMPONENT SPECIFICATIONS
- COMMON ALARM/CABINET LIGHT – SEE COMPONENT SPECIFICATIONS

ELECTRICAL GENERAL NOTES

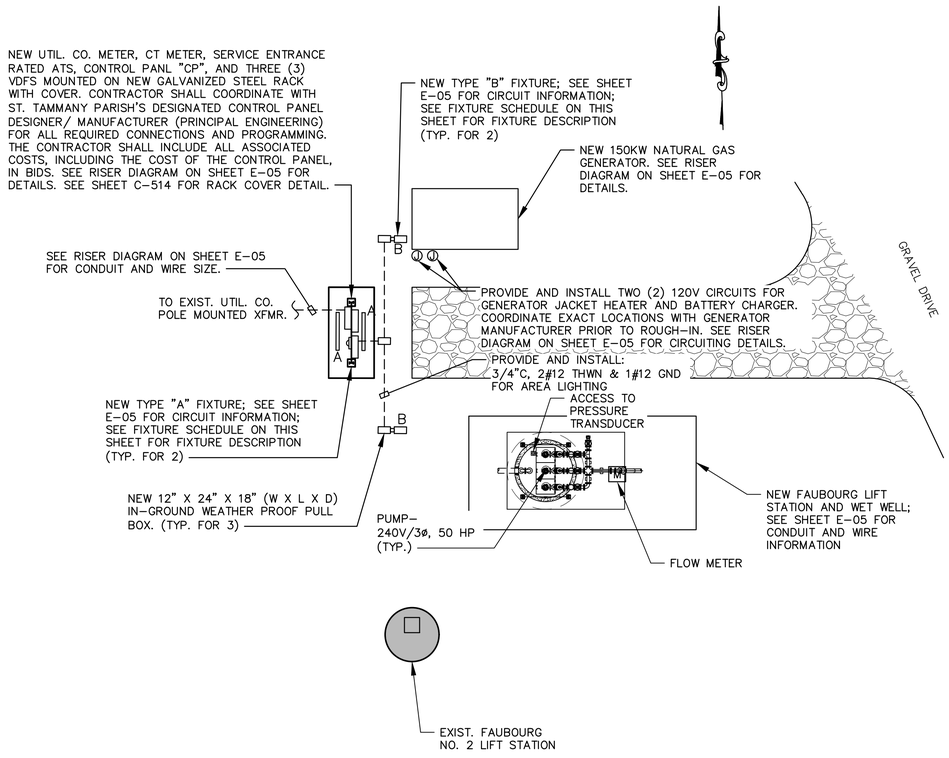
1. ALL ELECTRICAL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE. ALL WORK SHOWN IS NEW UNLESS NOTED OTHERWISE.
2. THE CONDUIT SYSTEM, ALL ELECTRICAL EQUIPMENT, ALL STEEL STRUCTURES, MOTOR FRAMES, ETC. SHALL BE CONNECTED TO THE GROUNDING SYSTEM PER ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE.
3. ALL EQUIPMENT LOCATIONS SHALL BE VERIFIED IN THE FIELD WITH MECHANICAL TRADES, CONDUIT ROUTING AND EQUIPMENT LOCATIONS SHOWN ARE DIAGRAMMATIC ONLY. THE EXACT LOCATION OF ALL EQUIPMENT AND ROUTING OF CABLES SHALL BE COORDINATED WITH & APPROVED BY ST. TAMMANY PARISH'S REPRESENTATIVE DURING CONSTRUCTION.
4. LOCATIONS OF CONDUITS, BOXES, FITTINGS, ETC., ARE DIAGRAMMATIC. IT SHALL BE THE ELECTRICAL CONTRACTORS RESPONSIBILITY TO VERIFY ALL SIZES AND LOCATIONS. REVIEW ALL MECHANICAL SHOP DRAWINGS AND COORDINATE WITH THE MECHANICAL CONTRACTOR, OWNER, AND ENGINEER TO INSURE THE TIMELY DELIVERY AND PROPER INSTALLATION OF ALL ELECTRICAL EQUIPMENT. (I.E. CONTROL PANELS, AREA LIGHTING, ETC.)
5. BEFORE INSTALLATION, THE ELECTRICAL CONTRACTOR SHALL SUBMIT DETAILED LAYOUT DRAWINGS TO THE ENGINEER FOR REVIEW COVERING PROPOSED LOCATIONS, MOUNTING, AND ROUTING FOR ALL CONDUITS, SERVICES, FITTINGS, GROUND RODS, AREA LIGHTING, CONTROL PANELS, SUPPORTS, ETC.
6. ENCLOSURE, JUNCTION BOXES, RECEPTACLES AND ALL OTHER ELECTRICAL EQUIPMENT USED OUTDOOR SHALL BE OF NEMA 4X (STAINLESS STEEL) CONSTRUCTION UNLESS OTHERWISE NOTED.
7. MINIMUM CONDUIT SIZE IS 3/4". ALL EXPOSED CONDUIT SHALL BE RIGID STEEL AND ALL DUCT BANK CONDUIT SHALL BE SCHEDULE 40PVC UNLESS NOTED OTHERWISE.
8. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE MECHANICAL CONTRACTOR AND CAREFULLY REVIEW THE MECHANICAL PACKAGES PROPOSED TO BE SUPPLIED. IT SHALL BE THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO INSURE THAT ALL WIRE AND CONDUIT NEEDED FOR ELECTRICAL APPURTENANCES, ASSOCIATED WITH MECHANICAL PACKAGES, ARE PROVIDED EVEN IF NOT SPECIFICALLY CALLED FOR IN THE PLANS AND SPECIFICATIONS.
9. THERE SHALL BE WARNING LABELS LOCATED ON THE FRONT OF EACH ELECTRICAL ENCLOSURE. SEE SIGNAGE DETAIL ON SHEET E-06.
10. CONTRACTOR SHALL COORDINATE ALL ASPECTS OF NEW SERVICE, INCLUDING LEAD TIMES, WITH UTILITY COMPANY AND INCLUDE ALL COSTS IN BID.
11. WARNING TAPE SHALL BE INSTALLED 12 TO 18 INCHES BELOW GRADE OVER ALL CONDUITS.
12. PROVIDE 1/4" MINIMUM DIAMETER PULL ROPE. PULL ROPE SHALL NOT BE NYLON STRING.
13. FOR SERVICE ENTRANCE CONDUITS, UTILIZE LONG RADIUS (36") CONDUIT BENDS.
14. ALL CONDUIT RISERS FROM UNDERGROUND SHALL HAVE RIGID METAL ELLS AND RISERS.
15. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES. AVOID DISTURBANCE OF EXISTING UTILITIES NOT INCLUDED IN THIS PROJECT.
16. SETSCREW CONDUIT FITTINGS SHALL NOT BE PERMITTED.
17. CONTRACTOR SHALL MAKE ALL NECESSARY INTERCONNECTIONS BETWEEN CONTROL PANELS AND EQUIPMENT FURNISHED BY OTHERS AS INSTRUCTED BY THE SUPPLIER OF SUCH EQUIPMENT. COORDINATE WITH THE EQUIPMENT SUPPLIER PRIOR TO BIDDING AND INCLUDE ALL ASSOCIATED COSTS IN BIDS.

LIGHTING FIXTURE SCHEDULE

A — 4' LED VAPORTIGHT FIXTURE, POLYCARBONATE HOUSING, CHAIN HANGER, MOUNT AT 10'-0" AFF, 4,000 LUMENS, 4000K, 120 VOLT: LITHONIA LIGHTING #CSVT-L48-ALO3-MVOLT-SWW3-80CRI-HC36 OR PRIOR APPROVED EQUAL

B — LED AREA LIGHTING FIXTURE, DIE-CAST ALUMINUM HOUSING, POLE MOUNT, 20,000 LUMENS, 4000K, 120 VOLT: LITHONIA LIGHTING #DSX1-LED-P6-40K-70CRI-T4M-MVOLT; BEACON #RAR2-320L-165-4K7-4W-UNV-ASQ; OR PRIOR APPROVED EQUAL

LOCATION MAP



ELECTRICAL SITE PLAN
1" = 10'-0"

PARISH ENGINEERING
7600 Innovation Park Drive
Baton Rouge, LA 70820
(225)332-0222
parisheng.com | #23-112

ST. TAMMANY PARISH GOVERNMENT

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY: CC
DRAWN BY: CC
CHECKED BY: SG
SUBMITTED BY: MT
PROJECT No.: TU23000171 TU23000175
ISSUE DATE: 06/2024
APPROVED BY: MT
SHEET SIZE: ANSI D
SCALE: AS SHOWN

STATE OF LOUISIANA — MICHAEL TERRY PEREZ III — 37911 — REGISTERED PROFESSIONAL ENGINEER — ELECTRICAL ENGINEERING
06/18/2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171 & TU23000175

NEW FAUBOURG LIFT STATION - ELECTRICAL SITE PLAN

SHEET NO.
E-05
SHEET 39 of 42

PANEL "CP"

*TYPE:*BOLT-ON BREAKER PANELBOARD *MOUNTING:*SURFACE

*SERVICE:*120/240 VOLT, 3ø, 4W *AIC:*22,000

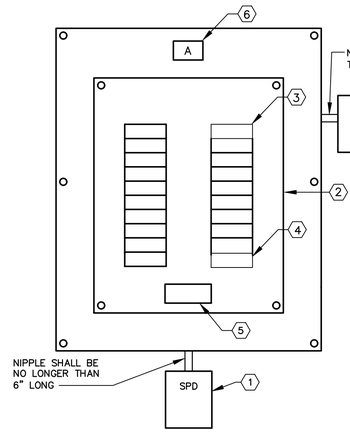
*MAIN:*600 AMP MCB *REMARKS:*GROUND BUS

bkr. no.	trip amp	bkr. pole	wire size	cd	service
1	200	3	3/0	2"	PUMP #1 (50 HP)
2	200	3	3/0	2"	PUMP #2 (50 HP)
3	200	3	3/0	2"	PUMP #3 (50 HP)
4	20	1	12	3/4"	RECEPTACLES
5	20	1	12	3/4"	LIGHTING/PHOTOCELL
6	20	1	12	3/4"	CONTROL POWER
7	20	1	12	3/4"	MAGMETER
8	20	1	12	3/4"	GEN. BATTERY CHARGER
9	20	1	12	3/4"	GEN. JACKET HEATER
10	60	3	6	1"	EXTERNAL SPD
11–12	20	1			SPARE

NOTE: PROVIDE PLAQUE IDENTIFYING HIGH LEG OF PANEL.

LOAD SUMMARY

ITEM	CONNECTED LOAD (VOLT-AMPS)			DEMAND LOAD (VOLT-AMPS)
LIGHTING	466	X	125% =	583
RECEPTACLES	540			
(First 10,000 Watts)	540	X	100% =	540
(Remaining Watts)	0	X	50% =	0
LARGEST MOTOR (50 HP)	54,040	X	125% =	67,550
MOTORS (remaining)	108,080	X	100% =	108,080
MISC. (gen. access., SCADA, etc.)	5,225	X	100% =	5,225
TOTAL				181,978 VA
AMPERAGE (AT 240V/3ø) :				438 A



VERTICAL ORIENTATION

KEYNOTES

1. EXTERNALLY INSTALLED SPD.
2. ELECTRICAL PANEL.
3. 3 POLE CIRCUIT BREAKER POSITION FOR TOP MOUNTED SPD.
4. 3 POLE CIRCUIT BREAKER POSITION FOR BOTTOM MOUNTED SPD.
5. NAMEPLATE.
6. PANEL NAME AS PER PROJECT PANEL.

CONTRACTOR'S ATTENTION:

REFERENCE THE "SURGE PROTECTION DEVICE" SPECIFICATION FOR ADDITIONAL INSTALLATION REQUIREMENTS.

SPD INSTALLATION DETAIL

NOT TO SCALE

SIGNAGE:

1) THE BELOW SIGN SHALL BE MOUNTED ON THE FRONT OF ALL ELECTRICAL ENCLOSURES.

1/16" THICK

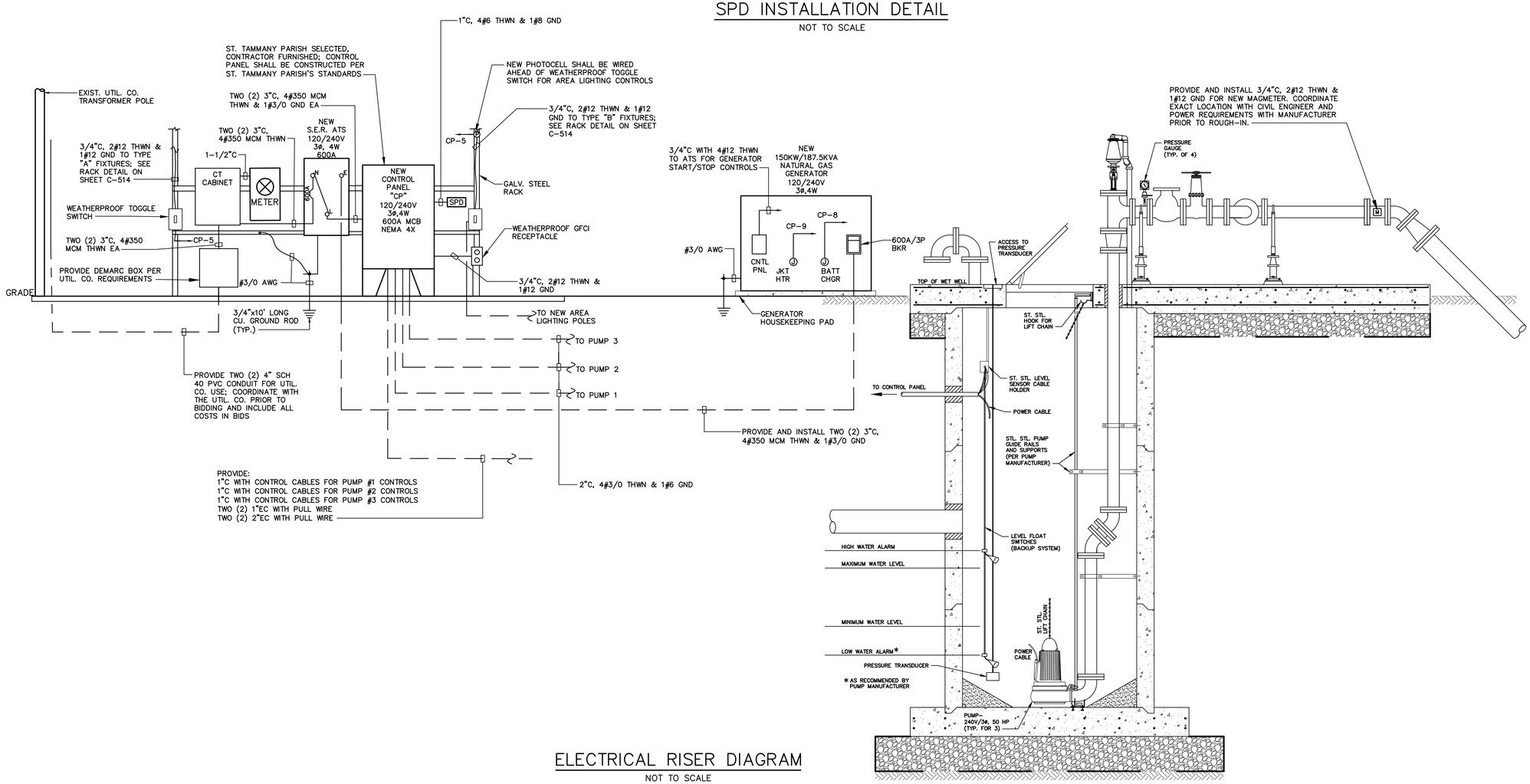
WARNING!
DISCONNECT POWER PRIOR TO
WORKING WITHIN THIS ENCLOSURE

THIS EQUIPMENT CAN ONLY BE SERVICED
BY QUALIFIED PERSONNEL

SIGNAGE NOTES:

1. NAMEPLATES TO BE FABRICATED FROM LAMACOID PLASTIC WITH BLACK OUTER LAMINATION AND A WHITE INNER LAMINATION.
2. LETTERING SHALL BE 1/4" HIGH CAPS, EXCEPT AS NOTED ON SCHEDULE. ENGRAVE LETTERS TO EXPOSE WHITE LAMINATION.
3. ATTACH NAMEPLATES ON EQUIPMENT IN A PROMINENT PLACE. USE TWO (2) SMALL SHEET METAL SCREWS FOR SHEET METAL ENCLOSURES. USE CONTACT BOND CEMENT ON ALL OTHER TYPE ENCLOSURES. ASSURE THAT SURFACE IS CLEAN AND FREE OF PAINT.

SIGNAGE DETAIL



ELECTRICAL RISER DIAGRAM

NOT TO SCALE

PARISH ENGINEERING
7600 Innovation Park Drive
Baton Rouge, LA 70820
(225)332-0222
parisheng.com | #23-112

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY: CC
DRAWN BY: CC
CHECKED BY: SG
SUBMITTED BY: MT
PROJECT No.: TU23000171
TU23000175
ISSUE DATE: 06/2024
APPROVED BY: MT
SHEET SIZE: ANSI D
SCALE: AS SHOWN

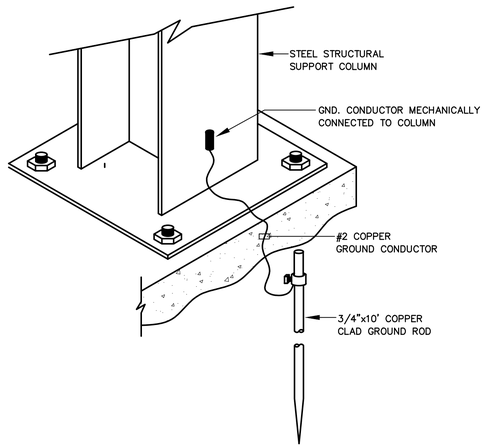
STATE OF LOUISIANA — MICHAEL TODD BERRY — 32019 — LICENSED PROFESSIONAL ENGINEER — ELECTRICAL ENGINEERING
06/18/2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

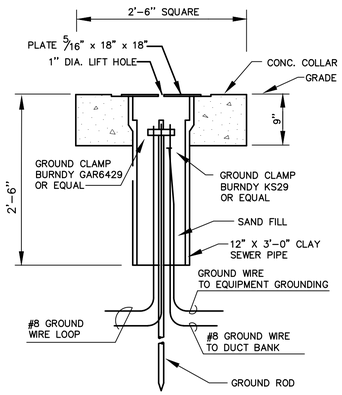
NEW FAUBOURG LIFT STATION – RISER DIAGRAM, SCHEDULE, & DETAILS

SHEET NO.
E–06
SHEET 40 of 42

P:\Active Projects\23-112 PEC_STP Post Oak Sewer Consolidation & Faubourg Lift Station Improvements – Post Oak Pump Station\23-112 ELEC\NEW FAUBOURG LIFT STATION – ELECTRICAL.dwg [E-06] Jun 18, 2024 – 3:27pm by sghashghaee



SUPPORT RACK STEEL GROUNDING DETAIL
NOT TO SCALE



GROUNDWELL DETAIL
NOT TO SCALE

TYPICAL PANELBOARD PLAQUE

(INDICATE PANEL DESIGNATION)
—/— VOLTS — PHASE — WIRE
— AMPS MAIN —
FED FROM
(INDICATE FEEDER ORIGINATION I.D.)
(PANEL AND CIRCUIT NO.)

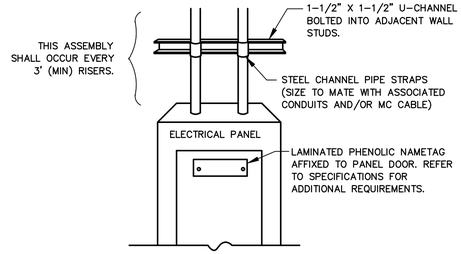
TYPICAL DISCONNECT PLAQUE

(INDICATE EQUIPMENT DESCRIPTION)
FUSED AT — AMPERES
FED FROM
(INDICATE FEEDER ORIGINATION I.D.)
(PANEL AND CIRCUIT NO.)

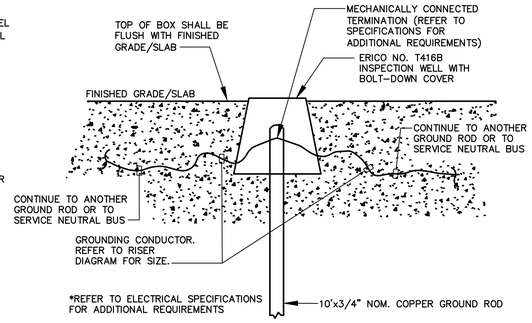
SIGNAGE NOTES:
SEE SPECIFICATIONS FOR MATERIALS, COLORS SIZE LETTERING, ETC.

ATTACH PLAQUES USING INDUSTRIAL GRADE DOUBLE FACE ADHESIVE.

EQUIPMENT SIGNAGE DETAIL
NOT TO SCALE

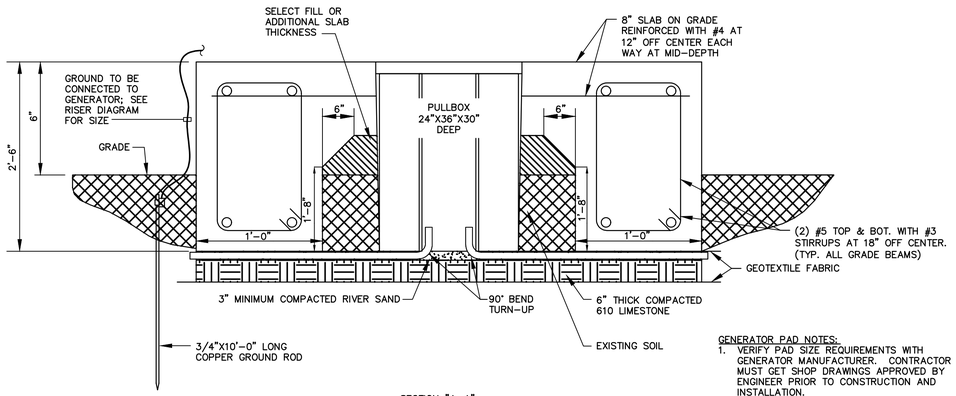


CONDUIT SUPPORT DETAIL
NOT TO SCALE



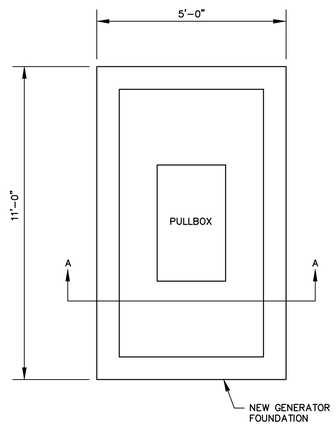
NOTE:
SUBMIT DIGITAL PHOTOS OF ALL GROUNDING TERMINATIONS

GROUND ROD INSTALLATION DETAIL
SCALE: NOT TO SCALE

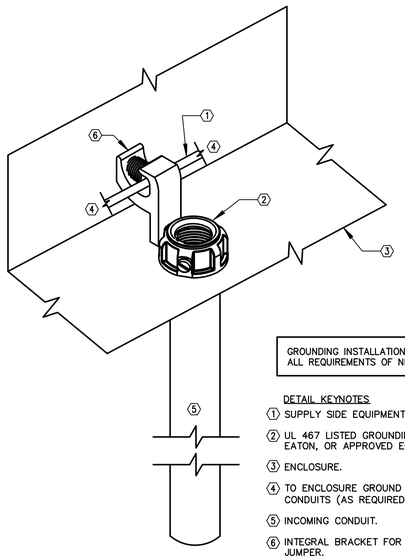


SECTION "A-A"

GENERATOR PAD NOTES:
1. VERIFY PAD SIZE REQUIREMENTS WITH GENERATOR MANUFACTURER. CONTRACTOR MUST GET SHOP DRAWINGS APPROVED BY ENGINEER PRIOR TO CONSTRUCTION AND INSTALLATION.
2. PULLBOX SHALL BE QUAZITE #PG2436BA30 OR APPROVED EQUAL.



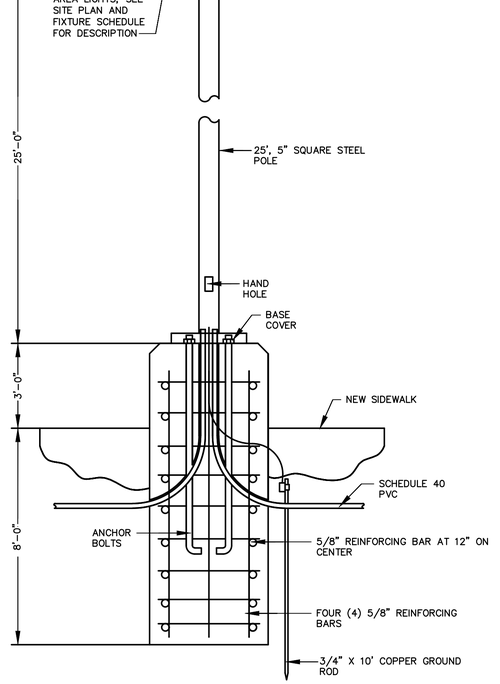
GENERATOR PAD DETAIL
NOT TO SCALE



GROUNDING INSTALLATION SHALL MEET ALL REQUIREMENTS OF NEC 250.92.

DETAIL KEYNOTES
1. SUPPLY SIDE EQUIPMENT BONDING JUMPER.
2. UL 467 LISTED GROUNDING BUSHING BY APPLETON, EATON, OR APPROVED EQUIVALENT.
3. ENCLOSURE.
4. TO ENCLOSURE GROUND BUS OR ADDITIONAL CONDUITS (AS REQUIRED).
5. INCOMING CONDUIT.
6. INTEGRAL BRACKET FOR ATTACHMENT OF BONDING JUMPER.

CONDUIT GROUND BUSHING DETAIL
NOT TO SCALE



AREA LIGHTING POLE DETAIL
NOT TO SCALE

PARISH ENGINEERING
7600 Innovation Park Drive
Baton Rouge, LA 70820
(225)332-0222
parisheng.com | #23-112

ST. TAMMANY PARISH GOVERNMENT

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	CC
DRAWN BY:	CC
CHECKED BY:	SG
SUBMITTED BY:	MT
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	06/2024
APPROVED BY:	MT
SHEET SIZE:	ANSI D
SCALE:	AS SHOWN

STATE OF LOUISIANA
MICHAEL TERRY LEVY
LICENSED PROFESSIONAL ENGINEER
06/18/2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

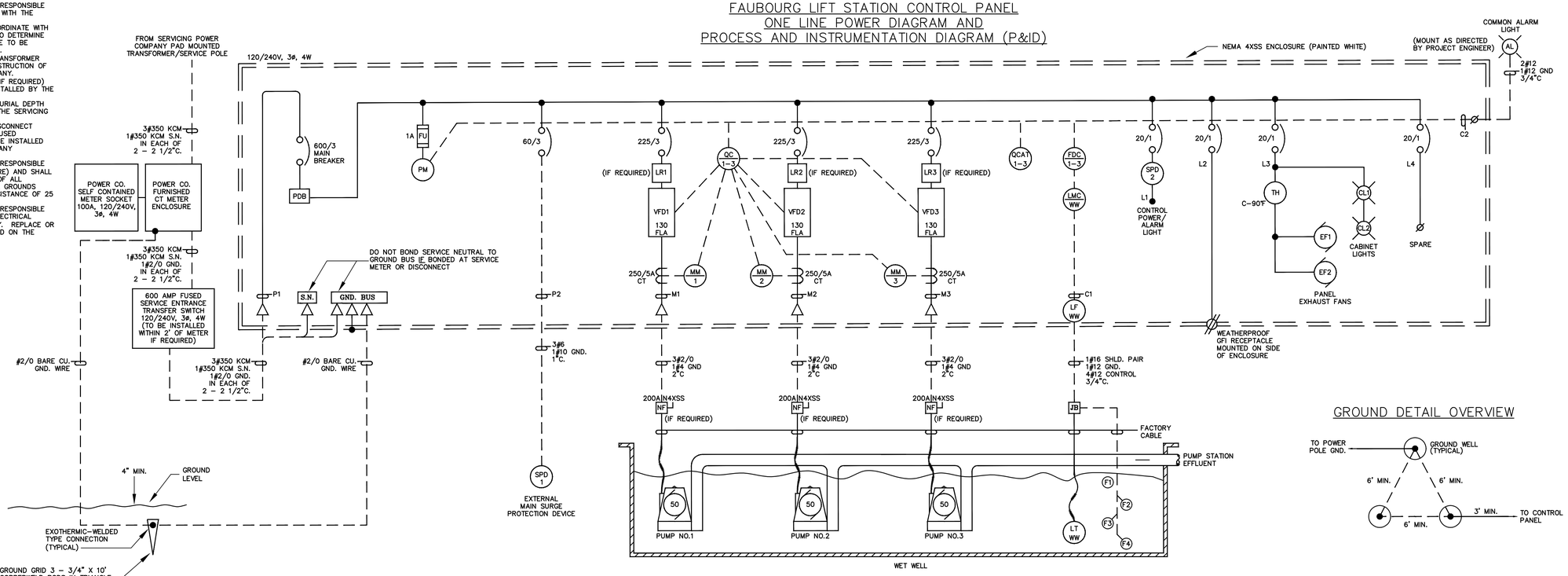
NEW FAUBOURG LIFT STATION – ELECTRICAL DETAILS

SHEET NO.
E-07
SHEET 41 of 42

P:\Active Projects\23-112 PEC_STP Post Oak Sewer Consolidation & Faubourg Lift Station Improvements – Post Oak Pump Station\23-112 ELEC\NEW FAUBOURG LIFT STATION – ELECTRICAL.dwg [E-07] Jun 18, 2024 – 3:15pm by sghashghaee

NOTES:
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE SERVICING POWER COMPANY.
2. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER AND ENGINEER TO DETERMINE WHETHER ELECTRICAL SERVICE TO BE OVERHEAD OR UNDERGROUND.
3. SERVICE POLE/PADMOUNT TRANSFORMER SHALL BE INSTALLED PER INSTRUCTION OF THE SERVICING POWER COMPANY.
4. AREA LIGHT/SERVICE LIGHT (IF REQUIRED) SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR.
5. SERVICE POLE HEIGHT AND BURIAL DEPTH SHALL BE AS REQUIRED BY THE SERVICING POWER COMPANY.
6. SUPPLY SIDE NON-FUSED DISCONNECT SWITCH, METER BASE, AND FUSED DISCONNECT SWITCH SHALL BE INSTALLED PER SERVICING POWER COMPANY REQUIREMENTS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GROUND GRID (IF REQUIRE) AND SHALL VERIFY PROPER GROUNDING OF ALL ELECTRICAL EQUIPMENT. ALL GROUNDS SHALL HAVE A MAXIMUM RESISTANCE OF 25 OHMS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EVALUATING EXISTING ELECTRICAL SERVICE CONDITION/CAPACITY. REPLACE OR UPGRADE AS REQUIRED BASED ON THE NEEDS OF THIS CONTRACT.

FAUBOURG LIFT STATION CONTROL PANEL ONE LINE POWER DIAGRAM AND PROCESS AND INSTRUMENTATION DIAGRAM (P&ID)

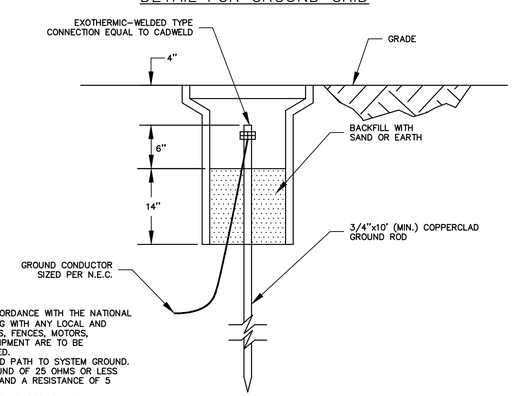


GROUND DETAIL OVERVIEW

OPERATIONAL DESCRIPTION USING VARIABLE FREQUENCY DRIVE(S) & SUBMERSIBLE TRANSDUCER

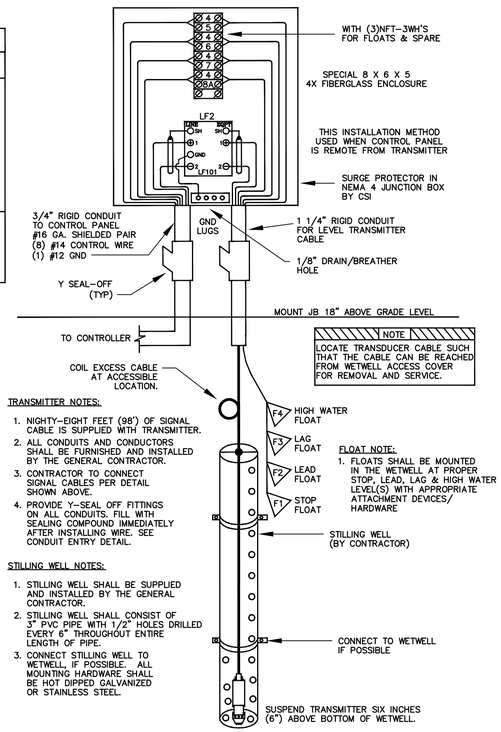
EQUIPMENT	
WETWELL PUMPS NO.1, NO.2 & NO.3	WETWELL PUMPS SHALL OPERATE ON A LEAD/LAG BASIS AS CONTROLLED BY THE QUADRAPLEX PUMP CONTROLLER (QC1-3), PER PROJECT SPECIFICATIONS. IN THE AUTOMATIC MODE, THE QUADRAPLEX PUMP CONTROLLER SHALL RECEIVE START AND STOP COMMANDS BASED UPON THE LEVEL IN THE STATION WETWELL AS SENSED BY THE SUBMERSIBLE PRESSURE/LEVEL TRANSMITTER (LT-WW). BACK-UP FLOAT SWITCHES SHALL BE UTILIZED IN THE EVENT OF A SUBMERSIBLE PRESSURE/LEVEL TRANSMITTER FAILURE. THE FREQUENCY DRIVE CONTROLLER (FDC1-3) SHALL BALANCE THE SPEED OF THE PUMP(S) TO MAINTAIN THE DESIRED LEVEL SETTING. WHEN HIGH LEVEL IS REACHED, THE PUMP(S) SHALL INCREASE SPEED TO MAINTAIN A LEVEL BELOW THE HIGH SETPOINT. AS THE LEVEL IN THE WETWELL DECREASES, THE PUMP(S) SHALL SLOW DOWN TO MAINTAIN A WETWELL LEVEL ABOVE THE STOP SETPOINT. WHEN THE STOP SETPOINT IS REACHED, THE PUMP(S) SHALL STOP OPERATING. PUMP NO.3 WILL BE A STAND BY PUMP, STILL OPERATING IN A 1-2-3 SEQUENCE. ALL PUMPS SHALL BE EXERCISED UNIFORMLY. FLOATS SHALL BE SET AS DIRECTED BY THE PROJECT ENGINEER. THE COMMON ALARM LIGHT SHALL BE ACTIVATED IN THE EVENT OF A LEVEL TRANSMITTER FAILURE. PUMP(S) SHALL NOT BE ALLOWED TO OPERATE ON HIGH TEMPERATURE AND SHALL ALTERNATE TO THE NEXT AVAILABLE PUMP. PUMP(S) SHALL ALTERNATE ON PUMP FAILURE AND SEAL FAILURE WHEN EITHER CONDITION IS DETECTED AND THE PUMP(S) ARE IN THE AUTOMATIC MODE OF OPERATION. THE FAILED PUMP SHALL BECOME THE LAG PUMP ON FUTURE CYCLES UNTIL THE FAILURE CONDITION IS CORRECTED.
COMMON ALARMS	THE ALARM LIGHT SHALL BURN DIM AND STEADY DURING NORMAL CONDITIONS AND FLASH BRIGHTLY DURING THE FOLLOWING ALARM CONDITIONS: WETWELL HIGH LEVEL PUMP(S) FAILURE (QTY. OF 3) PUMP(S) HIGH/OVER-TEMP (QTY. OF 3) IMPROPER SEQUENCE

SINGLE GROUND WELL DETAIL FOR GROUND GRID



GROUNDING NOTES:
1. GROUND THE ELECTRICAL SYSTEM IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC) ARTICLE 250 ALONG WITH ANY LOCAL AND STATE CODES. CONDUIT WORK, BUILDINGS, FENCES, MOTORS, PANELBOARDS, AND ALL ELECTRICAL EQUIPMENT ARE TO BE EFFECTIVELY AND PERMANENTLY GROUNDED.
2. FEEDER CONDUITS SHALL PROVIDE A GOOD PATH TO SYSTEM GROUND.
3. GROUNDING SYSTEM RESISTANCE TO GROUND OF 25 OHMS OR LESS SHALL BE CONSIDERED AS THE MINIMUM AND A RESISTANCE OF 5 OHMS OR LESS SHALL BE THE GOAL.
4. PROVIDE CERTIFIED TEST REPORTS OF GROUND RESISTANCE.

SUBMERSIBLE LEVEL TRANSMITTER/FLOAT INSTALLATION DETAIL

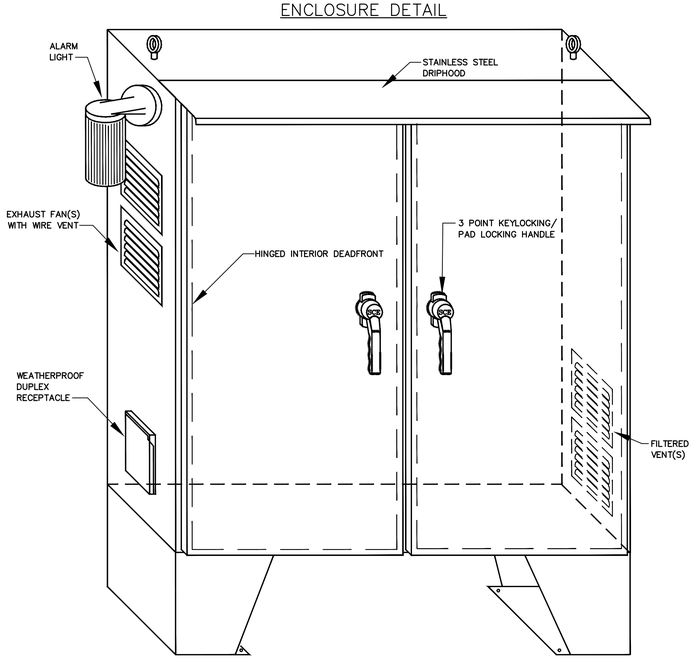


TRANSMITTER NOTES:
1. NIGHTY-EIGHT FEET (98') OF SIGNAL CABLE IS SUPPLIED WITH TRANSMITTER.
2. ALL CONDUITS AND CONDUCTORS SHALL BE FURNISHED AND INSTALLED BY THE GENERAL CONTRACTOR.
3. CONTRACTOR TO CONNECT SIGNAL CABLES PER DETAIL SHOWN ABOVE.
4. PROVIDE Y-SEAL OFF FITTINGS ON ALL CONDUITS. FILL WITH SEALING COMPOUND IMMEDIATELY AFTER INSTALLING WIRE. SEE CONDUIT ENTRY DETAIL.

FLOAT NOTE:
1. FLOATS SHALL BE MOUNTED IN THE WETWELL AT PROPER STOP, LEAD, LAG & HIGH WATER LEVEL(S) WITH APPROPRIATE ATTACHMENT DEVICES/ HARDWARE

STILLING WELL NOTES:
1. STILLING WELL SHALL BE SUPPLIED AND INSTALLED BY THE GENERAL CONTRACTOR.
2. STILLING WELL SHALL CONSIST OF 3" PVC PIPE WITH 1/2" HOLES DRILLED EVERY 6" THROUGHOUT ENTIRE LENGTH OF PIPE.
3. CONNECT STILLING WELL TO WETWELL, IF POSSIBLE. ALL MOUNTING HARDWARE SHALL BE HOT DIPPED GALVANIZED OR STAINLESS STEEL.

TRIPLEX CONTROL PANEL ENCLOSURE DETAIL



NEMA 4X STAINLESS STEEL ENCLOSURE (PAINTED WHITE)
(Properly sized as required)

PARISH ENGINEERING
7600 Innovation Park Drive
Baton Rouge, LA 70820
(225)332-0222
parisheng.com | #23-112

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

No.	DESCRIPTION OF REVISION	DATE:

DESIGNED BY:	CC
DRAWN BY:	CC
CHECKED BY:	SG
SUBMITTED BY:	MT
PROJECT No.:	TU23000171
	TU23000175
ISSUE DATE:	06/2024
APPROVED BY:	MT
SHEET SIZE:	ANSI D
SCALE:	AS SHOWN

STATE OF LOUISIANA — MICHAEL TERRY GUILLORY — 38781 — REGISTERED PROFESSIONAL ENGINEER — 06/18/2024

POST OAK SEWER CONSOLIDATION AND FAUBOURG LIFT STATION IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA
PROJECT No.: TU23000171
& TU23000175

NEW FAUBOURG LIFT STATION - ELECTRICAL DETAILS

SHEET NO.
E-08
SHEET 42 of 42

P:\Active Projects\23-112 PEC_STP Post Oak Sewer Consolidation & Faubourg Lift Station Improvements - Post Oak Pump Station\23-112 ELEC\NEW FAUBOURG LIFT STATION - ELECTRICAL.dwg [E-08] Jun 18, 2024 - 3:27pm by sghashghaee