ST. TAMMANY PARISH

MICHAEL B. COOPER
PARISH PRESIDENT

April 19th, 2024

Please find the following addendum to the below mentioned BID.

Addendum No.: **1**

Bid#: **24-10-2**

Project Name: **Highway LA-21 Lift Station**

Bid Due Date: **Wednesday, April 24th, 2024 at 2:00 P.M.**

GENERAL INFORMATION:

Receipt of this addendum shall be acknowledged by inserting its number in the space provided on the Proposal.

The non-mandatory Pre-Bid Conference was conducted on April 3rd, 2024. The Attendance List is included in the attachments.

Specification Revision: **Section 16200 – Standby Power Generator, Part 2.05 Automatic Transfer Switch, Note T has been revised to require NEMA 4X – Stainless Steel Construction on the Automatic Transfer Switch. See Section 16200 – Standby Power Generator for more details, in this Addendum below.**

Specification Revision: **Section 16900 – Pump Control Panel, Part 1.02 has been revised to require NEMA 4X – Stainless Steel Construction on the Control Panel. See Section 16900 – Pump Control Panel for more details, in this Addendum below.**

Specification Addition: **Section 16900 – Pump Control Panel, Part 1.02, Note (l) has been added for the pump control to provide feed thru lugs or distribution block for 480V feeder to Mini Power Zone "LS". See Section 16900 – Pump Control Panel for more details, in this Addendum below.**

Drawing Clarification: **Sheet 46 – Electrical Plan has been revised to revise calls on the 'Riser Diagram' and add a table for the control panel. See Sheet 46 – Electrical Plan for more details, in this Addendum below.**

PRE-APPROVAL MATERIAL SUBMITTALS

1. KSB (KRTD 100-403/454XEG2-S) Submersible Pump and ABB Model ACQ580 VFD = NOT APPROVED

2. Gillette Model SP-1500 150 kW Natural Gas Generator Set and ASCO Series 300SE 200 Amp Automatic Transfer Switch = *APPROVED IF CONDITIONS ARE MET*

   The following items in this submittal do not meet the specifications:

   - Sound rating of generator enclosure does not meet specified DB rating.
   - Withstand and Closing Rating of Transfer Switch & Circuit Breaker highlighted for review does not meet specified kA rating.
   - Transfer Switch enclosure required to be NEMA 4X

3. Generac Industrial Power Model SG130, 125 kW Generator Set and Generac Model TX Series Automatic Transfer Switch = *APPROVED IF CONDITIONS ARE MET*

   The following items in this submittal do not meet the specifications:

   - Withstand and Closing Rating of Transfer Switch & Circuit Breaker highlighted for review does not meet specified kA rating.
   - Transfer Switch enclosure required to be NEMA 4X

QUESTIONS & ANSWERS:

Questions were presented by prospective bidders as shown below. Responses from the Engineer are also shown below:

Question 1: What is the construction cost estimate?
Answer 1: The Engineer's Opinion of Probable Construction Cost is $995,000.00.

Question 2: Is a geotech report available that can be provided for bidding purposes?
Answer 2: The Geotechnical Report (dated August 14th, 2023) has been included in this Addendum for reference.

Question 3: Will the parish be able to reduce the flow on the existing force mains long enough to perform the required tie-ins or do these tie-ins need to be bid as hot taps?
Answer 3: The existing force main connections shall be made by hard piping. The tie-in shall be made with advance notice to St. Tammany Parish – Dept. of Utilities at mutually agreed upon time. The tie-in shall take place within four (4) continuous hours. Contractor shall submit their proposed Sequence of Construction to the Project Engineer for approval prior to beginning work onsite. See Notes on Sheet 9 – Suggested Sequence of Construction in this Addendum below.

Question 4: Is there a section or detail that can be provided to show the thickness of the existing concrete slab?
Answer 4: The existing concrete slab varies in thickness across the site. There is a section of the concrete slab which has been removed for reference. See 'Wet Well – Looking East' picture on Sheet 7 – Topographic & Boundary Survey. It is recommended that prospective bidders visit the site for further understanding of the existing condition.

Question 5: The plans call for a 6" aggregate surface course but the detail on sheet 13 shows a 10" section. Is the detail on sheet 13 correct?
Answer 5: The Aggregate Surface Course section, shown on Sheet 13 - Details, is correct. Reference to '6" Thick' has been removed from the Unit Price Form, Specification Section 01025 – Measurement and Payment, and drawings (Sheets 2, 10 & 11).

Question 6: Can a spec be provided for allowable backfill material for the wet well?
Answer 6: Required backfill material shall be Compacted Granular Material (River Sand), min. density 95% Standard Proctor (ASTM D698), placed in 12" max. layers. The Excavation and Backfill requirements apply per Section 02300. Work and backfill shall be included under Item No. 116 – 10' I.D. Concrete Wet Well. See Note 11 under the 'Notes' on Sheet 12 – Lift Station Plan and Elevation in this Addendum below.

Question 7: Will the contractor be allowed to do temporary lane shifts using the center turn lane during working hours to assist with deliveries?

Answer 7: Short-term deliveries will be allowed using proper flagging operations to maintain through traffic. If temporary lane shifts operations are needed for any deliveries, the Contractor shall coordinate with DOTD for prior approval before performing these activities. These operations will be performed at no direct pay. See Note 6 under the 'Sequence of Construction General Notes' on Sheet 9 - Suggested Sequence of Construction.

Question 8: How do we go about making an appointment with someone to schedule a visit to the jobsite?

Answer 8: This project site is fully accessible at all times.

ATTACHMENTS:

1. Pre-Bid Sign-in Sheet
2. Geotechnical Engineering Report (August 14, 2023)
3. Unit Price Form
   - Revise Item No. 129:

     Change from 'Item 129 - 6" Thick Aggregate Surface Course' to 'Item 129 - Aggregate Surface Course'

SPECIFICATIONS

1. Section 01025 – Measurement and Payment
   - Revise Note CC of Part – 1.03 Base Bid to read:

     Change from 'Item 129 - 6" Thick Aggregate Surface Course' to 'Item 129 - Aggregate Surface Course'

2. Section 16200 – Standby Power Generator
   - Revise Note T of Part – 2.05 Automatic Transfer Switch to read:

     "The transfer switch mechanism and controls are to be mounted in a NEMA 4X enclosure."

3. Section 16900 – Pump Control Panel
   - Revise Part – 1.02 Electrical Control Panel to read:

     "The NEMA 4X stainless steel control panel shall house both VFD's each equipped with integral liquid level control, moisture and thermal protection modules and will be provided with the minimum of the following:"

   - Add Note (l) to Part – 1.02 Electrical Control Panel:

     "Pump Control Panel shall be provided with feed thru lugs or distribution block for 480V feeder (2#12, 1#12 GND) to Mini Power Zone "LS". It shall be the contractor's option to incorporate the required 5kVA transformer and 120V circuit breakers into the Pump Control Panel in lieu of Mini Power Zone "LS"."

DRAWINGS

1. Sheet 2 – General Notes:
   - Revise Item No. 129:

     Change from '6" THICK AGGREGATE SURFACE COURSE' to 'AGGREGATE SURFACE COURSE'

2. Sheet 10 – Site Layout Plan
   - Revise Legend - Required:

     Change from '6" AGGREGATE SURFACE COURSE' to 'AGGREGATE SURFACE COURSE'

3. Sheet 11 – Grading Plan
   - Revise Legend - Required:

     Change from '6" AGGREGATE SURFACE COURSE' to 'AGGREGATE SURFACE COURSE'

4. Sheet 12 – Lift Station Plan and Elevation
   - Add Note 11 to 'Notes':

     "Required backfill material shall be Compacted Granular Material (River Sand), min. density 95% Standard Proctor (ASTM D698), placed in 12" max. layers. The Excavation and Backfill requirements apply per Section 02300. Work and backfill shall be included under Item No. 116 – 10' I.D. Concrete Wet Well."

5. Sheet 13 – Details:
   - Revise date of referenced geotechnical report under 'PAVEMENT NOTES (ALL SECTIONS):

     Change from '8/11/2023' to '8/14/2023'

6. Sheet 46 – Electrical Plan:
   - Add table for 'Panel: "LS"'

   - Revise conduit call from Pump Control Panel to Wet Well

<< End of Addendum #1 >>

St. Tammany Parish Government
Office Complex, 21454 Koop Dr.
Mandeville, LA 70471

Pre-Bid Sign-In Sheet

April 3, 2024; 2:00 PM

Highway LA-21 Lift Station; BID No.: 24-10-2

Page:

Name	Company	Email	Phone
Bob Moeinian	St. P. Gov.	BMoeinian@STPgov.org	985-893-1717
Ricky Galloway	High Tide Consultants	ricky@hightidela.com	985-446-1110
TYLER AMEDEE	HIGH TIDE CONSULTANTS	tyler@hightidela.com	985-446-1110
Dylan Ordoyne	LA Contracting Enterprise	bidding@la-cont.com	985-446-2212
GREG PALIARO	CRAIG'S ELECTRICAL	GREGP@CRAIGSELECTRICAL.COM	504.914.8858
Bradley Cieslinski	Command Construction, LLC	michelle@commandindustries.com	504-887-8795
Brandon Himel	RNGD Infastructure LLC	bhimel@rngd.com	985-231-8898
CHRIS Rowan	RNGD Infrastructure LLC	CRowan@rngd.com	504-296-7809
Evan Conravey	Subterranean Const LLC	econravey@subtllc.com	985-246-6767
Shelley Speed	STPG	slspeed@stpgov.org	985-867-5095

STRATUM ENGINEERING, LLC
Geotechnical Engineering ♦ Testing and Inspection Services

August 14, 2023

High Tide Consultants LLC
409 W. 21st Avenue, Suite B
Covington, Louisiana 70433
Phone: (985) 227-5462

Attn: Mr. Ricky Galloway, P.E.

Re: Geotechnical Engineering Report
Proposed Sewer Lift Station
LA Highway 21
Covington, Louisiana
SE Project No. G23-075

Dear Ricky:

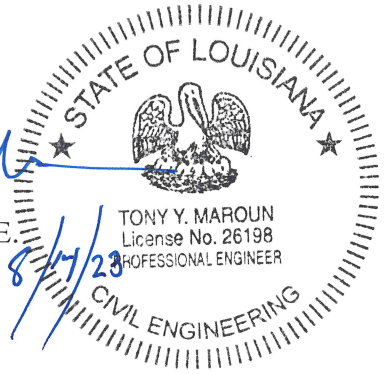
Stratum Engineering, LLC (SE) is pleased to submit our Geotechnical Engineering Report for the above referenced project. This report includes the field data and laboratory test results, as well as recommendations for foundation design.

We appreciate the opportunity to perform this geotechnical study and look forward to working with you during the design and construction phases of this project. If you have any questions pertaining to this report, or if we may be of further service, please do not hesitate to call.

Respectfully submitted,
STRATUM ENGINEERING, LLC

William "Dean" McInnis, P.E.
Senior Project Manager

Tony Y. Maroun, P.E.
Principal



WDM/TYM

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PROJECT INFORMATION

Project Authorization

Stratum Engineering, LLC (SE) has completed a geotechnical exploration for the proposed sewer lift station to be constructed on the east side of LA Highway 21 in Covington, Louisiana. The exploration was accomplished in general accordance with SE Proposal No. G23-078, dated April 20, 2023.

Project Description

The project includes the construction of a new sewer lift station to supplement the existing station which will remain in-place. While design details for the lift station were not provided at the time this report was prepared, we understand that the bottom of the wet well will likely be set about 25 to 30 feet below the existing ground surface.

The geotechnical recommendations presented in this report are based on the available project information, structure location, and the subsurface materials described in this report. If any of the noted information is incorrect, please inform SE in writing so that we may amend the recommendations presented in this report, if appropriate, and if desired by the client. SE will not be responsible for the implementation of its recommendations when it is not notified of changes in the project.

Purpose and Scope of Services

The purpose of this study was to explore the subsurface conditions at the site to enable an evaluation of acceptable foundation systems for the proposed sewer lift station. The scope of services included drilling one (1) boring to a depth of 40 feet in the area of the new lift station. Our scope of services also included a reconnaissance of the project site, drilling the soil boring, select laboratory testing, and preparation of this geotechnical report. The report briefly outlines the testing procedures, presents available project information, describes the site and subsurface conditions, and provides recommendations regarding the following:

- Foundation type, depths, allowable bearing capacities, and estimate of settlements;
- Seismic site classification;
- Site preparation, including subgrade preparation and fill compaction requirements;
- Factors influencing construction and performance of the proposed improvement.

SITE AND SUBSURFACE CONDITIONS

Site Location and Description

The site of the new lift station is located adjacent to an existing lift station situated on the east side of LA Highway 21 just south of Christwood Boulevard and Christ Episcopal School in Covington. The property is accessible via an aggregate surfaced drive off LA Highway 21 which leads to a cleared area of the site.

Drilling, Sampling, and Laboratory Testing Procedures

The boring was drilled with an All-Terrain Vehicle (ATV) mounted drilling rig. Wet rotary drilling technique was used to advance the boring. Samples were generally obtained continuously from the ground surface to a depth of ten feet and at maximum five foot intervals thereafter. Drilling and sampling techniques were accomplished in general accordance with ASTM Standards.

Undisturbed samples of cohesive soils were generally obtained using thin-wall tube sampling procedures in general accordance with the procedures for "Thin-Walled Tube Geotechnical Sampling of Soils" (ASTM D1587). These samples were extruded in the field with a hydraulic ram and were wrapped in aluminum foil prior to placement in a plastic wrapping to preserve moisture. The samples were transported to the laboratory in containers to prevent disturbance.

The laboratory testing program included supplementary visual classification and water content tests on all of the soil samples. In addition, selected samples were subjected to unconfined compression testing, percent passing the #200 sieve and Atterberg Limits determination. Additional estimates of unconfined compressive strength were made using a hand penetrometer. The laboratory testing was performed in general accordance with ASTM Standard Procedures.

Subsurface Conditions

The site was characterized by drilling one (1) boring in the proposed lift station area to a depth of 40 feet. Based on the boring, the surface was covered with about 8 inches of silty topsoil with traces of brick and aggregate which was underlain by silt with sand and very stiff silty clay to about 4 feet. The moisture sensitive surficial material was followed by stiff to very stiff lean clay to a depth of 17 feet. The lean clay was underlain by stiff to very stiff fat clay extending to a depth of at least 40 feet, the maximum depth explored.

The above subsurface description is of a generalized nature to highlight the major subsurface stratification features and material characteristics. The boring log included in the Appendix should be reviewed for specific information at the boring location. This record includes soil descriptions, stratification, penetration resistances, and locations of the samples and laboratory test data. The stratification shown on the boring log represents the conditions only at the actual boring location. Variations may occur and should be expected between locations. The stratification represents the approximate boundary between subsurface materials and the actual transition may be gradual. Water level information obtained during field operations is also shown on the boring log. The samples, which were not altered by laboratory testing, will be retained for 60 days from the date of this report and then will be discarded.

Groundwater Conditions

Groundwater was initially encountered at a depth of about 8 ½ feet below the existing ground surface, but was later measured around 7 ½ feet upon completion of the drilling operation. However, it should be noted that groundwater levels will fluctuate with seasonal variations in rainfall, extended periods of drought, or surface runoff. In addition, it is recommended that the actual groundwater level at the site be determined by the contractor at the time of the construction activities.

IBC Site Classification

The International Building Code (IBC), 2021 Edition, was reviewed to determine the site classification for seismic design. Based on the soils encountered in the boring and our experience in the general vicinity, the site can be classified as Site Class "D", as outlined in Section 1613.2.2 of the Building Code.

EVALUATION AND RECOMMENDATIONS

General

The type and depth of foundation suitable for a given structure primarily depends on several factors including the subsurface conditions, the function of the structure, the loads it may carry, the cost of the foundation and the criteria set by the Design Engineer with respect to vertical and differential movement which the structure can withstand without damage.

The results of the exploration indicate that the subsurface soil conditions at the site are generally fair in bearing quality and suitable for support of the proposed sewer lift station on a shallow foundation system. Details related to site preparation, foundation recommendations, as well as construction considerations are presented in subsequent sections of this report.

Site Preparation

Site preparation is expected to include, but not be limited to, stripping and removal of any surface vegetation or topsoil with organic materials within the lift station area. Any utility lines in the area should be located and re-routed, as necessary.

Should fill be required to grade the site, the structural fill should be free of organics or other deleterious materials. The fill may consist of sandy clay, silty sand or clayey sand having a maximum liquid limit of 40 percent and a maximum plasticity index of 20. The backfill around the structure should consist of sand having less than 10 percent passing the #200 sieve. The sand may be placed in an initial 24 inch lift and 12 inch lifts thereafter up to the finished grade. The fill should be compacted to at least 95 percent of the fill's maximum dry density as determined by ASTM D698 (Standard Proctor).

Lift Station Wet Well

While design details for the lift station were limited at the time the report was prepared, we have assumed that the pre-cast concrete wet well will be placed at a depth of approximately 25 to 30 feet below the existing ground surface. Based on the boring drilled in the wet well area, the surficial material was underlain by stiff to very stiff fat clay beginning around 17 feet and extending to the boring termination depth of 40 feet. The soils at the proposed bottom elevation of the wet well slab are estimated to have an allowable bearing pressure of about 2,500 psf which includes a factor of safety of 3.0.

Groundwater was encountered around 7 ½ feet at the time of the field exploration. Therefore, dewatering of the excavation area will likely be necessary to allow proper installation of the wet well. Based on the laboratory test results, a Coefficient of Permeability (k) for the fat clay encountered in the upper 40 feet of the boring was estimated to be on the order of 1×10^{-8} to 1×10^{-9} cm/sec. Dewatering is anticipated to be accomplished using a sump/pump system due to the low permeability of the clay. A braced excavation will be necessary to maintain safe access to the wet well area. The design of the dewatering system and bulkhead for the wet well braced excavation should be the responsibility of the contractor who should maintain both systems, as necessary, throughout the installation. Given the presence of groundwater at relatively shallow depth, the design of the wet well should take into consideration any buoyant forces exerted on the structure.

The foundation excavation should be observed by a representative of Stratum Engineering prior to placement of the wet well to assess that the foundation materials are consistent with the materials discussed in this report. Soft or loose soil zones encountered at the bottom of the excavation should be removed to the level of firm and suitable bearing soils as directed by the Geotechnical Engineer.

The foundation excavation should be observed and the well installed as quickly as possible to avoid exposure of the excavation bottom to wetting and drying. Surface run-off water should be drained away from the excavation and not be allowed to pond. If it is required that the excavation be left open for more than one day, it should be protected to reduce changes in moisture content of the bearing soils.

Bedding Material

Since the wet well will be constructed around 25 feet below the surface, wet conditions will likely be encountered which could impact the bearing materials at the bottom of the excavation. Therefore, it is recommended that aggregate bedding material be placed beneath the wet well slab and valve pit bottom slab to distribute the load and minimize initial subsidence. The bedding material should be at least 18 inches in thickness and up to 24 inches depending on the conditions encountered at the time of construction. The bedding material should consist of well-graded, free draining aggregate, meeting the requirements of #57 stone. The wet well excavation should be backfilled to the surface with granular fill (sand). The fill should be placed in lifts and compacted to 95 percent of the maximum dry density, as determined by ASTM D698. The initial lift may be 24 inches thick followed by 12 inch lifts thereafter up to finished grades.

CONSTRUCTION CONSIDERATIONS

It is recommended that SE be retained to provide observation and testing of construction activities involved in the foundations and related activities of this project. SE cannot accept any responsibility for any conditions which deviate from those described in this report, nor for the performance of the foundations, if not engaged to also provide construction observation and testing for this project.

Moisture Sensitive Soils/Weather Related Concerns

The upper soils encountered at this site are extremely sensitive to disturbances caused by construction traffic and changes in moisture content. During wet weather periods, an increase in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. In addition, soils that become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather.

Drainage and Groundwater Concerns

Water should not be allowed to collect in the foundation excavation or on the prepared subgrade in the construction area either during or after construction. Undercut or excavated areas should be sloped toward one corner to facilitate removal of any collected rainwater, groundwater, or surface runoff. Positive site surface drainage should be provided to reduce infiltration of surface water around the structure.

Groundwater was measured around 7 ½ feet below the existing ground surface upon completion of the drilling operation. However, it is possible that seasonal variations in precipitation will cause fluctuations of the water table. Additionally, perched water may be encountered in discontinuous zones within the overburden. Any water accumulation should be removed from the excavations by pumping. If excessive and uncontrolled amount of seepage occur, the Geotechnical Engineer should be consulted.

Installation of the lift station will likely require dewatering to facilitate installation of the wet well. The design of the dewatering system, if required, and the braced excavation are beyond the scope of this study and shall be the responsibility of the contractor.

Excavations

In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, Part 1926, Subpart P". This document was issued to better ensure the safety of workmen entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, basement excavation or footing excavation, be constructed in accordance with the new OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR, Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

We are providing this information solely as a service to our client. Stratum Engineering does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, state, and federal safety or other regulations.

REPORT LIMITATIONS

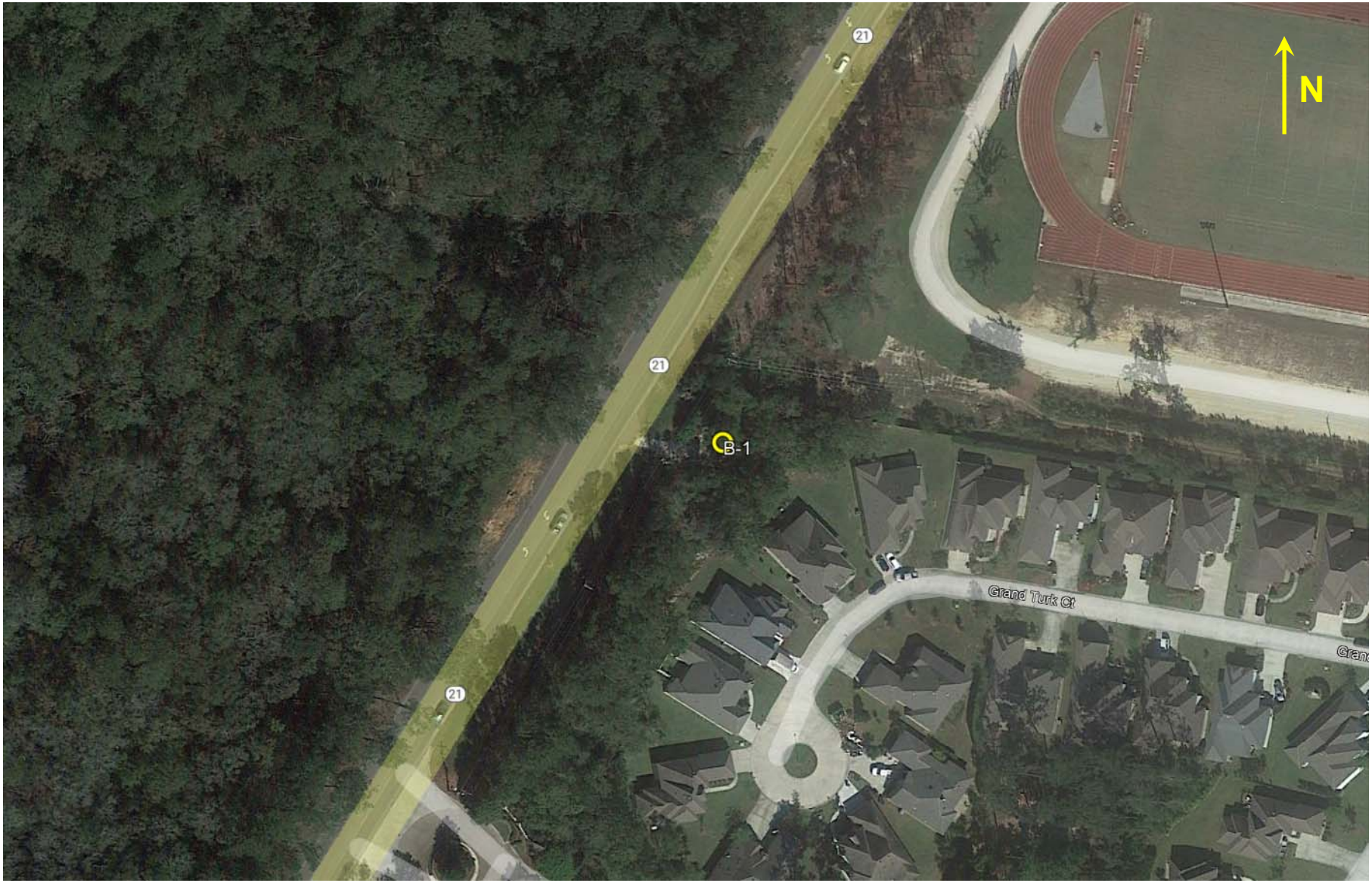
The recommendations submitted in this report are based on the available subsurface information obtained by SE and design details furnished by High Tide Consultants LLC. If there are any revisions to the plans for this project, or if deviations from the subsurface conditions noted in this report are encountered during construction, SE should be notified immediately to determine if changes in the foundation recommendations are required. If SE is not notified of such changes, SE will not be responsible for the impact of those changes on the project.

The Geotechnical Engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

After the plans and specifications are more complete, the Geotechnical Engineer should be retained and provided the opportunity to review the final design plans and specifications to check that our engineering recommendations have been properly incorporated in to the design documents. At that time, it may be necessary to submit supplementary recommendations. This report has been prepared for the exclusive use of High Tide Consultants LLC for the specific application to the proposed Sewer Lift Station to be constructed at the existing lift station site located on the east side of LA Highway 21 just south of Christwood Boulevard in Covington, Louisiana.

APPENDIX

STRATUM ENGINEERING, LLC



STRATUM ENGINEERING, LLC

BORING LOCATION PLAN

SE PROJECT NO. G23-075

GEOTECHNICAL ENGINEERING SERVICES
PROPOSED SEWER LIFT STATION
LA HIGHWAY 21
COVINGTON, LOUISIANA

STRATUM ENGINEERING, LLC

LOG OF BORING B-1

PROPOSED SEWER LIFT STATION
LA HIGHWAY 21
COVINGTON, LOUISIANA

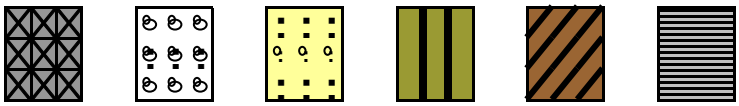
TYPE OF BORING: WET ROTARY **LOCATION:** LIFT STATION AREA **PROJECT NO.:** G23-075

DEPTH, FT.	SOIL TYPE	SAMPLES	DESCRIPTION	N-BLOWS/FT.	UNCONFINED COMPRESSIVE STRENGTH tsf	HAND PENTROMETER tsf	TORVANE tsf	UNIT DRY WEIGHT pcf	MOISTURE CONTENT %	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200 SIEVE
			8" Silty Topsoil with brick & aggregate						16			
			Gray Silt with sand									
			Very stiff tannish gray Silty Clay with sand		3.04	4.50		109	17			
5			Stiff to very stiff tannish gray Lean Clay			3.00			21			
					2.29	2.75		104	22	45	28	
			- with sand, 8' to 15'			1.50			25			
10												
			- firm to stiff with silt seams at 13'		0.67	1.25		90	31			
15												
			Stiff to very stiff tannish gray Fat Clay			2.50			37			
20												
					1.34	2.00		79	42	89	54	95
25												
			- becomes gray at 28'			3.00			35			
30												
			- with silt seams at 33'		1.06	2.00		98	26			
35												
						2.50			31			
40												
			Boring Terminated at 40 Feet									
45												
50												

DEPTH OF BORING: 40 Feet **GROUNDWATER:** Measured at 7 ½ Feet Upon Completion of Drilling
DATE: 7/24/2023

KEY TO TERMS AND SYMBOLS USED ON LOGS

SOIL TYPE

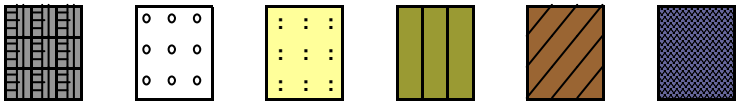


ROCK | GRAVEL | SAND | SILT | CLAY | PEAT

SAMPLER TYPE

NO SAMPLE | AUGER SAMPLE | SHELBY TUBE | SPLIT SPOON

MODIFIERS



STONE | GRAVELY | SANDY | SILTY | CLAYEY | FILL

NO RECOVERY | ROCK CORE | 2" SHELBY TUBE | TXDOT CONE

UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D 2487 (1980)

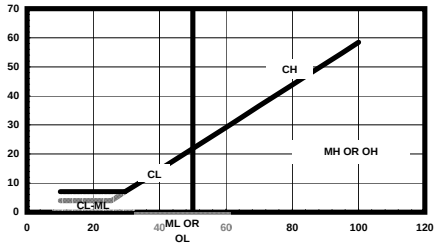
MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS LESS THAN 50% PASSING NO. 200 SIEVE	GRAVEL & GRAVELY SOILS LESS THAN 50% PASSING NO. 4 SIEVE	CLEAN GRAVEL (LITTLE OR NO FINES	GW	WELL GRADED GRAVEL, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
			GP	POORLY GRADED GRAVEL, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		W/ APPRECIABLE FINES	GM	SILTY GRAVEL, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN 50% PASSING NO. 4 SIEVE	CLEAN SANDS LITTLE FINES	SW	WELL GRADED SAND, GRAVELY SAND (LITTLE FINES)
			SP	POORLY GRADED SANDS, GRAVELY SAND (L.FINES)
		SANDS WITH APPREA. FINES	SM	SILTY SANDS, SAND-SILT MIXTURES
			SC	CLAYEY SANDS,SAND-CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS & VERY FINE SANDS,ROCK FLOUR SILTY OR CLAYEY FINE SANDS OR CLAYEY SILT W/ LOW PI
			CL	INORGANIC CLAY OF LOW TO MEDIUM PI LEAN CLAY GRAVELY CLAYS, SANDY CLAYS, SILTY CLAYS
			OL	ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PI
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY FAT CLAYS
			OH	ORGANIC CLAYS OF MED TO HIGH PI, ORGANIC SILT
HIGHLY ORGANIC SOIL			PT	PEAT AND OTHER HIGHLY ORGANIC SOILS
UNCLASSIFIED FILL MATERIALS			ARTIFICIALLY DEPOSITED AND OTHER UNCLASSIFIED SOILS AND MAN-MADE SOIL MIXTURES	

CONSISTENCY OF COHESIVE SOILS

CONSISTENCY	SHEAR STRENGTH IN TONS/FT^2
VERY SOFT	0. TO 0.125
SOFT	0.125 TO 0.25
FIRM	0.25 TO 0.5
STIFF	0.5 TO 1.0
VERY STIFF	1.0 TO 2.0
HARD	> 2.0 OR 2.0+

RELATIVE DENSITY - GRANULAR SOILS

CONSISTENCY	N-VALUE (BLOWS/FOOT)
VERY LOOSE	0-4
LOOSE	4-9
MEDIUM DENSE	10-29
DENSE	30-49
VERY DENSE	> 50 OR 50+



ABBREVIATIONS

HP - HAND PENETROMETER
TV - TORVANE
MV - MINIATURE VANE
UC - UNCONFINED COMPRESSION TEST
UU - UNCONSOLIDATED UNDRAINED TRAIXIAL
CU - CONSOLIDATED UNDRAINED

NOTE: PLOT INDICATES SHEAR STRENGTH AS OBTAINED BY ABOVE TESTS

DELAYED GROUNDWATER LVL

LEVEL GROUNDWATER ENCOUNTERED

CLASSIFICATION OF GRANULAR SOILS

U.S. STANDARD SIEVE SIZE(S)

6"	3"	3/4"	4	10	40	200

BOUL--DERS	COBBLES	GRAVEL		SAND			SILT	CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE		

152	76.2	19.1	4.76	2.0	0.42	0.075	0.002

GRAIN SIZE IN MM

LOUISIANA UNIFORM PUBLIC WORK BID FORM
UNIT PRICE FORM

Revised per Addendum No. 1 (04.19.24)

TO:

St. Tammany Parish Government

21454 Koop Drive, Suite 2F

Mandeville, LA. 70471

(OWNER TO PROVIDE NAME AND ADDRESS OF OWNER)

BID FOR:

Highway LA-21 Lift Station

STP DU Project No. TU23000173

Bid No. 24-10-2

(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	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
101	1	LUMP SUM		
Description:	☑ BASE BID OR	☐ ALT #	PRECONSTRUCTION VIDEO SURVEY	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
102	1	LUMP SUM		
Description:	☑ BASE BID OR	☐ ALT #	CLEARING AND GRUBBING	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
103	1	LUMP SUM		
Description:	☑ BASE BID OR	☐ ALT #	REMOVAL OF PORTLAND CEMENT CONCRETE PAVEMENT	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
104	45	SQUARE YARD		

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.

Version 2017 Q2

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 #	DEMOLITION	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
105	1	LUMP SUM		
Description:	☑ BASE BID OR	☐ ALT #	FILL AND GRADING	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
106	1	LUMP SUM		
Description:	☑ BASE BID OR	☐ ALT #	MODIFICATIONS TO EXISTING WET WELL	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
107	1	LUMP SUM		
Description:	☑ BASE BID OR	☐ ALT #	INSTALL YARD HYDRANT AND BACKFLOW PREVENTER	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
108	1	LUMP SUM		
Description:	☑ BASE BID OR	☐ ALT #	2-INCH GAS LINE	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
109	75	LINEAR FOOT		
Description:	☑ BASE BID OR	☐ ALT #	10" DIA. DI MJ GATE VALVE	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
110	1	EACH		

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.

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 #	EXIST. 4" DIA. SFM CONNECTION	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
111	1	LUMP SUM		
Description:	☑ BASE BID OR	☐ ALT #	EXIST. 6" DIA. SFM CONNECTION	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
112	1	LUMP SUM		
Description:	☑ BASE BID OR	☐ ALT #	EXIST. EFFLUENT 8" DIA. SFM CONNECTION	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
113	1	LUMP SUM		
Description:	☑ BASE BID OR	☐ ALT #	10" DIA. PVC SFM (DR18)(GREEN)	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
114	52	LINEAR FOOT		
Description:	☑ BASE BID OR	☐ ALT #	12" DIA. PVC (SDR26)(GREEN)	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
115	20	LINEAR FOOT		
Description:	☑ BASE BID OR	☐ ALT #	10' I.D. CONCRETE WET WELL	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
116	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.

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 #	ACCESS HATCH (48" X 72")(W/ FALL PROTECTION SYSTEM)	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
117	1	LUMP SUM		
Description:	☑ BASE BID OR	☐ ALT #	SUBMERSIBLE PUMPS (INTERNAL COMPONENTS & INSTALLATION)	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
118	1	LUMP SUM		
Description:	☑ BASE BID OR	☐ ALT #	8" DIA. DUCTILE IRON PIPE	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
119	35	LINEAR FOOT		
Description:	☑ BASE BID OR	☐ ALT #	10" DIA. DUCTILE IRON PIPE	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
120	7	LINEAR FOOT		
Description:	☑ BASE BID OR	☐ ALT #	CHECK VALVE (8")	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
121	2	EACH		
Description:	☑ BASE BID OR	☐ ALT #	GATE VALVE (8")	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
122	2	EACH		

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.

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 #	AIR RELEASE VALVE	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
123	2	EACH		
Description:	☑ BASE BID OR	☐ ALT #	EMERGENCY PUMP OUT ASSEMBLY	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
124	1	LUMP SUM		
Description:	☑ BASE BID OR	☐ ALT #	ELECTROMAGNETIC FLOWMETER	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
125	1	EACH		
Description:	☑ BASE BID OR	☐ ALT #	DUCTILE IRON FITTINGS	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
126	1220	POUND		
Description:	☑ BASE BID OR	☐ ALT #	PIPE SUPPORT	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
127	4	EACH		
Description:	☑ BASE BID OR	☐ ALT #	6" THICK PORTLAND CEMENT CONCRETE PAVEMENT	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
128	94	SQUARE YARD		

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.

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 #	AGGREGATE SURFACE COURSE	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
129	155	SQUARE YARD		
Description:	☑ BASE BID OR	☐ ALT #	ELECTRICAL CONDUIT AND WIRING	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
130	1	LUMP SUM		
Description:	☑ BASE BID OR	☐ ALT #	CONTROL PANEL & SUPPORT STRUCTURE (W/ METAL ROOF)	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
131	1	LUMP SUM		
Description:	☑ BASE BID OR	☐ ALT #	STAND-BY NATURAL GAS GENERATOR (125Kw)	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
132	1	LUMP SUM		
Description:	☑ BASE BID OR	☐ ALT #	FREESTANDING JIB CRANE (1 TON)	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
133	1	LUMP SUM		
Description:	☑ BASE BID OR	☐ ALT #	6' WOODEN FENCE	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
134	52	LINEAR FOOT		

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.

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 #	6' CHAIN LINK FENCE & GATES	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
135	90	LINEAR FOOT		
Description:	☑ BASE BID OR	☐ ALT #	SILT FENCE	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
136	190	LINEAR FOOT		
Description:	☑ BASE BID OR	☐ ALT #	TEMPORARY BYPASS PUMP SYSTEM	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
137	1	LUMP SUM		
Description:	☑ BASE BID OR	☐ ALT #	SITE RESTORATION	
REF NO.:	**QUANTITY**	**UNIT OF MEASURE**	**UNIT PRICE**	**UNIT PRICE EXTENSION (Quantity times unit price)**
138	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.

SECTION 01025 - MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 DESCRIPTION

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

B. The items listed below beginning with Article 1.03 are the same pay items listed in the Unit Prices Table of Section 00300 - Louisiana Uniform Public Works Bid Form. These items constitute all of the pay items for completion of the Contract. No direct or separate payment will be made for providing miscellaneous, temporary, or accessory works, plant, services, Contractor's or Engineer's field offices, layout surveys, job signs, sanitary requirements, testing, safety devices, approval and record drawings, water supplies, power, removal of waste, watchmen, bonds, insurance, taxes, and any other items necessary to complete the intent and letter of the Contract Documents. Compensation for all such services, things and materials required for a complete and usable facility shall be included in the prices stipulated for the lump sum and unit pay items listed herein.

1.02 ESTIMATED QUANTITIES

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

1.03 PAY ITEMS (Base Bid)

A. Item 101 – Mobilization

1. Description and Measurement: Item 101 includes all work as identified in Section 01505 - Mobilization. Mobilization shall not exceed 5% of the total contract price for the Base Bid. No partial measurement will be made for this item. Measurement will be made upon completion of all required items in Section 01505.
2. Payment: Mobilization will be paid at the lump sum price listed in the Unit Prices Table.

B. Item 102 – Preconstruction Video Survey

1. Description and Measurement: Item 102 includes all labor, materials, equipment and incidentals necessary for providing preconstruction audio-video recordings in accordance with Section 01050. No partial measurement will be made for this item. Measurements will be made upon provision of preconstruction videos accepted by the Engineer.

2. Payment: Preconstruction Video Survey will be paid at the lump sum price listed in the Unit Prices Table.

C. Item 103 – Clearing and Grubbing

1. Description and Measurement: Item 103 includes all labor, materials, equipment, and incidentals necessary for removal and disposal of all vegetation, debris, and excess fill in accordance with the Drawings and Specifications, as identified by the Engineer, and as necessary to complete the required improvements. Measurement will be made by percentage complete of the lump sum price in accordance with the schedule of values submitted by the Contractor and accepted by the Engineer.
2. Payment: Clearing and Grubbing will be paid at the at the lump sum price listed in the Unit Prices Table.

D. Item 104 – Removal of Portland Cement Concrete Pavement

1. Description and Measurement: Item 104 includes all labor, materials, equipment, and incidentals necessary to remove Portland cement concrete pavement in accordance with the Drawings and Specifications, and as directed by the Engineer. The price bid for this item shall include full depth sawcut between pavement to be removed and to remain. Measurement will be made by the square yard of pavement removed and accepted by the Engineer.
2. Payment: Removal of Portland Cement Concrete Pavement will be paid by the square yard price listed in the Unit Prices Table.

E. Item 105 – Demolition

1. Description and Measurement: Item 105 includes all labor, materials, equipment, and incidentals necessary for removal and disposal of all items including the removal and delivery of the existing sewer pump equipment in accordance with the Drawings and Specifications, as identified by the Engineer, and as necessary to complete the required improvements. Measurement will be made by percentage complete of the lump sum price in accordance with the schedule of values submitted by the Contractor and accepted by the Engineer.
2. Payment: Demolition will be paid at the at the lump sum price listed in the Unit Prices Table.

F. Item 106 – Fill and Grading

1. Description and Measurement: Item 106 includes all labor, materials, equipment, and incidentals necessary for the fill and grading required in accordance with the Drawings and Specifications, as identified by the Engineer, and as necessary to complete the required improvements. Measurement will be made by percentage complete of the lump sum price in accordance with the schedule of values submitted by the Contractor and accepted by the Engineer.
2. Payment: Fill and Grading will be paid at the at the lump sum price listed in the Unit Prices Table.

G. Item 107 – Modifications to Existing Wet Well

1. Description and Measurement: Item 107 includes all labor, materials, equipment, and incidentals necessary for the rehabilitation and modification of the existing concrete wet well in accordance with the Drawings and Specifications. This item includes cleaning, coating, and necessary repairs; backfill, compaction, grouting,

and shaping of the existing concrete floor; penetrations and tie-in of the influent and effluent sewer lines. Measurement will be made by percentage complete of the lump sum price in accordance with the schedule of values submitted by the Contractor and accepted by the Engineer.

2. Payment: Modifications to Existing Wet Well will be paid at the lump sum price listed in the Unit Prices Table.

H. Item 108 – Install Yard Hydrant and Backflow Preventer

1. Description and Measurement: Item 108 includes all labor, materials, equipment, and incidentals necessary to install a new backflow preventor, 1" Dia. water line and non-freeze hose bib as indicated on the Drawings. Excavation, handling, incidental adjustments, tie into existing water meter, bedding, backfill, and any other appurtenances required for the installation are included. Measurement will be made by percentage complete of the lump sum price in accordance with the schedule of values submitted by the Contractor and accepted by the Engineer.
2. Payment: Install Non-Freeze Hose Bib and Backflow Preventer will be paid at the at the lump sum price listed in the Unit Prices Table.

I. Item 109 – 2-inch Gas Line

1. Description and Measurement: Item 109 includes all labor, materials, equipment, and incidentals necessary for installing an open cut gas line in accordance with the Drawings and Specifications. Measurement will be made by linear foot of pipe installed and accepted by the Engineer.
2. Payment: 2-inch Gas Line will be paid by the linear foot price listed in the Unit Prices Table.

J. Item 110 – 10" Dia. DI MJ Gate Valve

1. Description and Measurement: Item 110 includes all labor, materials, equipment, and incidentals necessary to install the sewer force main gate valve in accordance with the Drawings and Specifications. Measurement will be made per each valve installed and accepted by the Engineer.
2. Payment: 10" Dia. DI MJ Gate Valve will be paid at the per each price listed in the Unit Prices Table.

K. Item 111 – Exist. 4" Dia. SFM Connection

1. Description and Measurement: Item 111 includes all labor, materials, equipment, and incidentals necessary to reroute and connect the existing influent 4" sewer force main in accordance with the Drawings and Specifications. Measurement will be made by percentage complete of the lump sum price in accordance with the schedule of values submitted by the Contractor and accepted by the Engineer.
2. Payment: Exist. 4" Dia. SFM Connection will be paid at the lump sum price listed in the Unit Prices Table.

L. Item 112 – Exist. 6" Dia. SFM Connection

1. Description and Measurement: Item 112 includes all labor, materials, equipment, and incidentals necessary to reroute and connect the existing influent 6" sewer force main in accordance with the Drawings and Specifications. Measurement will be made by percentage complete of the lump sum price in accordance with the schedule of values submitted by the Contractor and accepted by the Engineer.

2. Payment: Exist. 6” Dia. SFM Connection will be paid at the lump sum price listed in the Unit Prices Table.

M. Item 113 – Exist. Effluent 8” Dia. SFM Connection

1. Description and Measurement: Item 113 includes all labor, materials, equipment, and incidentals necessary to connect to the existing effluent 8” sewer force main in accordance with the Drawings and Specifications. Measurement will be made by percentage complete of the lump sum price in accordance with the schedule of values submitted by the Contractor and accepted by the Engineer.
2. Payment: Exist. Effluent 8” Dia. SFM Connection will be paid at the lump sum price listed in the Unit Prices Table.

N. Item 114 – 10” Dia. PVC SFM (DR18)(Green)

1. Description and Measurement: Item 114 includes all labor, materials, equipment, excavations, backfill, bedding, and incidentals necessary for installing an open cut 10” Dia. PVC sewer force main in accordance with the Drawings and Specifications. Measurement will be made by linear foot of pipe installed and accepted by the Engineer.
2. Payment: 10” Dia. PVC SFM (DR18)(Green) will be paid by the linear foot price listed in Unit Prices Table.

O. Item 115 – 12” Dia. PVC (SDR26)(Green)

1. Description and Measurement: Item 115 includes all labor, materials, equipment, excavations, backfill, bedding, and incidentals necessary for installing an open cut 12” Dia. PVC gravity sewer line in accordance with the Drawings and Specifications. Measurement will be made by linear foot of pipe installed and accepted by the Engineer.
2. Payment: 12” Dia. PVC (SDR26)(Green)will be paid by the linear foot price listed in Unit Prices Table.

P. Item 116 – 10’ I.D. Concrete Wet Well

1. Description and Measurement: Item 116 includes all labor, materials, equipment, and incidentals required to install the new 10’ I.D. Concrete Wet Well as indicated on the Drawings and Specifications. This item includes excavation and compaction of the backfill, installation and compaction of the aggregate bedding and geotextile fabric, connection of the sewer lines, and concrete top slab. Measurement will be made by percentage complete of the lump sum price in accordance with the schedule of values submitted by the Contractor and accepted by the Engineer.
2. Payment: 10’ I.D. Concrete Wet Well will be paid at the lump sum price listed in the Unit Prices Table.

Q. Item 117 – Access Hatch (48”x72”)(w/ Fall Protection System)

1. Description and Measurement: Item 117 includes all labor, materials, equipment, and incidentals necessary to install an access hatch with a fall protection system on the new concrete wet well in accordance with the Drawings and Specifications. Measurement will be made by percentage complete of the lump sum price in accordance with the schedule of values submitted by the Contractor and accepted by the Engineer.
2. Payment: Access Hatch (48”x72”)(w/ Fall Protection System) will be paid at the lump sum price listed in the Unit Prices Table.

R. Item 118 – Submersible Pumps (Internal Components & Installation)

1. Description and Measurement: Item 118 includes all labor, materials, equipment and incidentals required to install the new submersible pumps, guide rails, base, discharge piping, elevation controls, and internal components as indicated on the Drawings and Specifications. Measurement will be made by percentage complete of the lump sum price in accordance with the schedule of values submitted by the Contractor and accepted by the Engineer.
2. Payment: Submersible Pumps (Internal Components & Installation) will be paid at the lump sum price listed in the Unit Prices Table.

S. Item 119 – 8" Dia. Ductile Iron Pipe

1. Description and Measurement: Item 119 includes all labor, materials, equipment, excavations, backfill, and incidentals necessary for installing the 8" Dia. Ductile iron discharge pipe and required coatings in accordance with the Drawings and Specifications. Measurement will be made by linear foot of pipe installed and accepted by the Engineer.
2. Payment: 8" Dia. Ductile Iron Pipe will be paid by the linear foot price listed in Unit Prices Table.

T. Item 120 – 10" Dia. Ductile Iron Pipe

1. Description and Measurement: Item 120 includes all labor, materials, equipment, excavations, backfill, and incidentals necessary for installing the 10" Dia. Ductile iron discharge pipe in accordance with the Drawings and Specifications. Measurement will be made by linear foot of pipe installed and accepted by the Engineer.
2. Payment: 10" Dia. Ductile Iron Pipe will be paid by the linear foot price listed in Unit Prices Table.

U. Item 121 – Check Valve (8")

1. Description and Measurement: Item 121 includes all labor, materials, equipment, and incidentals necessary to install check valve(s) on the sewer discharge pipe in accordance with the Drawings and Specifications. Measurement will be made per each valve installed and accepted by the Engineer.
2. Payment: Check Valve (8") will be paid at the per each price listed in the Unit Prices Table.

V. Item 122 – Gate Valve (8")

1. Description and Measurement: Item 122 includes all labor, materials, equipment, and incidentals necessary to install gate valve(s) on the sewer discharge pipe in accordance with the Drawings and Specifications. Measurement will be made per each valve installed and accepted by the Engineer.
2. Payment: Gate Valve (8") will be paid at the per each price listed in the Unit Prices Table.

W. Item 123 – Air Release Valve

1. Description and Measurement: Item 123 includes all labor, materials, equipment, and incidentals necessary to install air release valve(s) on the sewer discharge pipe in accordance with the Drawings and Specifications. Measurement will be made per each valve installed and accepted by the Engineer.
2. Payment: Air Release Valve will be paid at the per each price listed in the Unit Prices Table.

X. Item 124 – Emergency Pump Out Assembly

1. Description and Measurement: Item 123 includes all labor, materials, equipment and incidentals required to install a new Emergency Pump Out (EPO) as indicated on the Drawings and Specifications. Measurement will be made by percentage complete of the lump sum price in accordance with the schedule of values submitted by the Contractor and accepted by the Engineer.
2. Payment: Emergency Pump Out Assembly will be paid at the lump sum price listed in the Unit Prices Table.

Y. Item 125 – Electromagnetic Flowmeter

1. Description and Measurement: Item 125 includes all labor, materials, equipment, and incidentals necessary to install the electromagnetic flow meter on the sewer discharge pipe in accordance with the Drawings and Specifications. Measurement will be made per each electromagnetic flowmeter installed and accepted by the Engineer.
2. Payment: Electromagnetic Flowmeter will be paid at the per each price listed in the Unit Prices Table.

Z. Item 126 – Ductile Iron Fittings

1. Description and Measurement: Item 126 includes all labor, materials, equipment, and incidentals necessary for installing all types of mechanical joint ductile iron fittings, including flanged reducers and bends, and required coatings in accordance with the Drawings and Specifications, for buried pipe only. Measurement will be made per pound of fitting installed and accepted by the Engineer. Weights used in measurement shall be as shown in the accepted submittal for each type of fitting.
2. Payment: Ductile Iron Fittings will be paid by the per pound price listed in the Unit Prices Table.

AA. Item 127 – Pipe Support

3. Description and Measurement: Item 127 includes all labor, materials, equipment, and incidentals necessary to install the pipe support(s) for the sewer discharge pipe in accordance with the Drawings and Specifications. Measurement will be made per each pipe support installed and accepted by the Engineer.
4. Payment: Pipe Support will be paid at the per each price listed in the Unit Prices Table.

BB. Item 128 – 6” Thick Portland Cement Concrete Pavement

1. Description and Measurement: Item 128 includes all labor, materials, equipment, and incidentals necessary for furnishing, installing, forming, jointing, finishing, and curing concrete pavement; in accordance with the Drawings and Specifications. Grading and compaction of base material and provision, placement, and compaction of incidental granular material to grade below paving are included. Measurement will be made by the square yardage of concrete pavement installed and accepted by the Engineer.
2. Payment: 6” Thick Portland Cement Concrete Pavement will be paid at the square yard price listed in the Unit Prices Table.

CC. Item 129 – Aggregate Surface Course

1. Description and Measurement: Item 129 includes all labor, materials, equipment, and incidentals necessary for installing aggregate surface course in accordance with the Drawings and Specifications. Grading and compaction of base material and provision, placement, and compaction of incidental granular material to grade below paving are included. Measurement will be made by the square yardage of aggregate surface course installed and accepted by the Engineer.
2. Payment: Aggregate Surface Course will be paid at the square yard price listed in the Unit Prices Table.

DD. Item 130 – Electrical Conduit and Wiring

1. Description and Measurement: Item 130 includes all labor, materials, equipment and incidentals required to provide electrical service to the control panel, pumps, and crane as indicated on the Drawings and Specifications. Excavation, handling, incidental adjustments, electrical conduit, backfill, and any other appurtenances required for the installation are included. Measurement will be made by percentage complete of the lump sum price in accordance with the schedule of values submitted by the Contractor and accepted by the Engineer.
2. Payment: Electrical Conduit and Wiring will be paid at the lump sum price listed in the Unit Prices Table

EE. Item 131 – Control Panel & Support Structure (w/ Metal Roof)

1. Description and Measurement: Item 131 includes all labor, materials, equipment and incidentals required to install a new control panel, structural support, and roof as indicated on the Drawings and Specifications. Excavation, handling, incidental adjustments, structural metal, anchor bolts, foundation system, backfill, roofing, and any other appurtenances required for the installation are included. Measurement will be made by percentage complete of the lump sum price in accordance with the schedule of values submitted by the Contractor and accepted by the Engineer.
2. Payment: Control Panel & Support Structure (w/ Metal Roof) will be paid at the lump sum price listed in the Unit Prices Table.

FF. Item 132 – Stand-by Natural Gas Generator (125kW)

1. Description and Measurement: Item 132 includes all labor, materials, equipment and incidentals required to install a new 125 kW generator and ATS as indicated on the Drawings and Specifications. Measurement will be made by percentage complete of the lump sum price in accordance with the schedule of values submitted by the Contractor and accepted by the Engineer.
2. Payment: Stand-by Natural Gas Generator (125kW) will be paid at the lump sum price listed in the Unit Prices Table.

GG. Item 133 – Freestanding Jib Crane (1 Ton)

1. Description and Measurement: Item 133 includes all labor, materials, equipment and incidentals required to install the freestanding jib crane, hoist, and foundation as indicated on the Drawings and Specifications. Measurement will be made by percentage complete of the lump sum price in accordance with the schedule of values submitted by the Contractor and accepted by the Engineer.
2. Payment: Freestanding Jib Crane (1 Ton) will be paid at the lump sum price listed in the

Unit Prices Table.

HH. Item 134 – 6’ Wooden Fence

1. Description and Measurement: Item 134 includes all labor, materials, equipment, and incidentals necessary for installing a new 6’ Wooden fence in accordance with the Drawings and Specifications. Measurement will be made by linear foot of fence installed and accepted by the Engineer. Gates will not be paid separately.
2. Payment: 6’ Wooden Fence will be paid by the linear foot price listed in Unit Prices Table.

II. Item 135 – 6’ Chain Link Fence & Gates

1. Description and Measurement: Item 135 includes all labor, materials, equipment, and incidentals necessary for installing a new 6’ chain-link fence and gates (black) in accordance with the Drawings and Specifications. Measurement will be made by linear foot of fence installed (including gates) and accepted by the Engineer. Gates will not be paid separately.
2. Payment: 6’ Chain Link Fence & Gates will be paid by the linear foot price listed in Unit Prices Table.

JJ. Item 136 – Silt Fence:

1. Description and Measurement: Item 136 includes all labor, materials, equipment and incidentals required to install a silt fence as indicated on the Drawings and Specifications. Measurement will be made by linear foot of silt fence installed and accepted by the Engineer.
2. Payment: Silt Fence will be paid by the linear foot price listed in Unit Prices Table.

KK. Item 137 – Temporary Bypass Pump System

1. Description and Measurement: Item 137 includes all necessary wastewater flow control for continuous operation of the existing lift station in accordance with Section 02995 - Temporary Bypass Pumping and in accordance with the Drawings is included in this item. Measurement will be made by percentage complete of the lump sum price in accordance with the schedule of values submitted by the Contractor and accepted by the Engineer.
2. Payment: Temporary Bypass Pump System will be paid by the lump sum price listed in Unit Prices Table.

LL. Item 138 – Site Restoration:

1. Description and Measurement: Item 138 includes all labor, materials, equipment, and incidentals required to restore project sites to their original condition and to accomplish any supporting work required in order to carry out the intent of the Contract Documents. This includes, but is not limited to, miscellaneous embankment (not covered by other pay item), grading, ditch grading, reinstatement of signs & mailboxes, seeding, sodding, and other items as necessary to restore the site to pre-construction condition. No payment will be made for restoring any damage caused by the Contractor’s operations. Measurement will be made by percentage complete of the lump sum price in accordance with the schedule of values submitted by the Contractor and accepted by the Engineer.
2. Payment: Site Restoration will be paid at the lump sum price listed in the Unit

Prices Table.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 16200 - STANDBY POWER GENERATOR

PART 1 - 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

B. 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.

C. 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.

D. 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.

E. Warranty:

1. Submit manufacturer’s warranty statement to be provided for this Project.

PART 2 - 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 125kW, at 80 percent lagging power factor, 277/480V Wye, Three phase, 4-wire, 60 hertz.

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.

2.05 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 200 amperes continuous operation 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 480 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 - 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 16200

SECTION 16900 – PUMP CONTROL PANEL

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope: The pump manufacturer shall have provide a Duplex Pump Control system that shall control 2 pumps in an energy conservation mode of operation. The system shall be capable of adapting to changing inflow conditions and shall automatically regulate pumped outflow based on inflow conditions and shall seek an optimal energy efficiency for the pump station. This shall be accomplished by providing Variable Frequency Drives with built in integral logic software that is SCADA ready for operation. This system will incorporate the functionality as noted in the following sections.

1.02 Electrical Control Panel

The NEMA 4X stainless steel control panel shall house both VFD's each equipped with integral liquid level control, moisture and thermal protection modules and will be provided with the minimum of the following:

(a) Mainline lugs of the appropriate sizes shall be furnished for connecting the incoming supply power. The lugs shall be suitable for use with aluminum or copper conductors.

(b) Each pump motor circuit shall be protected by a properly sized E frame molded case circuit breaker. Each pole of these breakers shall provide inverse time delay overload protection and instantaneous short circuit protection by means of a thermal magnetic element. The breaker shall be operated by a toggle type handle and shall have a Quick-make, Quick-break over center switching mechanism that is mechanically trip free from the handle so that the contacts cannot be held closed against short circuits and abnormal currents. Tripping due to overload or short circuit shall be clearly indicated by the handle automatically assuming a position midway between the manual "ON" and "OFF" position. The minimum interrupting rating of the breaker shall be 42,000 amps at 460 VAC. Pump motor circuit breaker toggle shall be operable through a cutout in the inner door.

(c) Hand-Off-Automatic (integral the VFD HMI) switches to select the operating mode for each pump installed on the control panel inner deadfront door.

(d) Elapsed time meters for each pump motor.

(e) In the event either pump operation selector switch is in the "Off" position, the control system software shall automatically designate the operating pump motor as the "next pump motor to operate" after that pump motor is started.

(f) The hinged inner door shall be provided fabricated from, 5052-H32.080, marine alloy aluminum. The hinged inner door shall contain cutouts for all circuit breaker toggles. Control switches and indicators shall be labeled and mounted to the hinged inner door to keep operators from entering the live electrical compartment. A warning sign stating "DANGER -- Disconnect All Sources Of Power Before Opening Door" shall be installed on the inner door. The inner door shall be completely removable for ease of service and shall be held closed by at least (2) hand operated 1/4 turn fasteners. The following items shall be mounted on the inner door:

i. Pilot lights – Alarm, Pump Run, Pump Fail
ii. Hand-Off-Automatic – Integral to the VFD Operator Interface

(g) The control system enclosure shall include a removable back-panel. The back-panel shall be painted white and fabricated from cold roll steel.

(h) Components shall be fastened to the back-panel using stainless steel pinhead machine screws. All devices shall be clearly labeled in accordance with the schematic ladder diagram.

(i) Transient Voltage Surge Surpressors on the 120VAC circuit

(j) Loop Power Surge Surpressor

(k) Lightening Arresstor

(l) Pump Control Panel shall be provided with feed thru lugs or distribution block for 480V feeder (2#12, 1#12 GND) to Mini Power Zone "LS". It shall be the Contractor's option to incorporate the required 5kVA transformer and 120V circuit breakers into the Pump Control Panel in lieu of Mini Power Zone "LS".

B. Variable Frequency Drives

(a) A Variable Frequency pump drive shall be provided for each pump in the system, sized for the appropriate voltage and power. The pump drive shall be supplied by the pump manufacturer and designed for wastewater pumping and with functionality pre-programmed for the specific pump model used. The pump drive shall provide all level control functionality, hand/auto operation, pump alternation, pump over temperature monitoring, seal leakage monitoring, pump self-cleaning, sump cleaning and pipe cleaning algorithms without the need for an external PLC. The pump drive shall also include capability to monitor station inflow, pump speed and energy consumption in order to automatically operate the pump station at optimal energy efficiency.

The pump drive shall be tested and approved in accordance with national and international standards and comply with Directive 98/37/EC, Safety of Machinery and EN60204-1.

It shall conform to the relevant safety provisions of the Low Voltage Directive 2006/95/EC and the EMC Directive 2004/108/EC and has been designed and manufactured in accordance with the following harmonized European standards:

EN 61800-5-1: 2003	Adjustable speed electrical power drive systems. Safety requirements. Electrical, thermal and energy.
EN 61800-3 2nd Ed: 2004	Adjustable speed electrical power drive systems. EMC requirements and specific test methods
EN 55011: 2007	Limits and Methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment (EMC)
EN60529 : 1992	Specifications for degrees of protection provided by enclosures

The variable frequency drive ampere rating shall be equal to or greater than the ampere rating listed on the motor being driven by the variable frequency drive.

(b) The drive units shall be modularly constructed. Printed circuit boards shall be connected in such manner that they are easily removed from the unit. Power components shall be readily accessible and be connected in such manner that they are easily removed from the unit. The pump drive shall be freestanding for wall mounting or cabinet installation construction, for 460V, 60HZ 3Phase power supply. It holds an IP55 and IP66 isolation class.

C. System Operation – VFD functionality

(a) High/Low Level Sump Control:

i. The pump controls system shall provide automatic level control via means of a submersible pressure transducer (4-20mADC) and one (1) non-mercury liquid level float switch. User-programmable Start Level shall indicate the point at which the pump will start. Upon activation the pump shall run at maximum speed for a pre-determined period, then ramp down to the energy efficient Optimal speed, calculated by the pump drive. When the water level reaches the Stop Level, the pump shall stop. The Optimal Speed shall either be calculated by the pump drive or manually entered by the user.

In case of high inflow, the pump drive shall increase pump speed until the water level begins to decrease. When the water level reaches the

Stop Level, the pump shall stop.

In case of very high inflow, in a duplex installation, when a single pump is unable to overcome the inflow conditions even at maximum speed, additional pumps shall be activated and run at maximum speed until the Stop Level is reached. If water levels continue to rise, a High Level Alarm shall be activated.

The pump drive shall incorporate a Minimum Speed function that prevents the pump from operating at speeds too low to move water based on the pump curve.

(b) Run Time Averaging (Duplex Application Only):

i. In cases of duplex pumps/drives, the pump drive shall provide capability to balance run times for even wear. This shall be an internal function of the drive and not require external devices, such as an Alternating Relay. The function shall operate by determining a "random" start level based on the Start Level setting. Each drive shall determine its own random start level independent of each other. New random start levels will be determined every 24 hours. The pump with the lowest random start level shall be first to start on any given pump cycle. The second pump shall remain in Standby capacity in case the lead pump shall not be able to lower the water level as described in the section above. By recalculating the random start levels every 24 hours, balanced run times are accomplished.

(c) Pump Cleaning Function:

i. The Pump drive shall incorporate a "self-cleaning" function to remove debris from the impeller. The cleaning shall be triggered by three circumstances:

1. Soft Clogging: When motor current equals 20% or greater above rated motor current, in the drive, for a period of 7 seconds.
2. Hard Clogging: When motor current equals 80% or greater above rated current for a period of 0.01 seconds.
3. Schedule Cleaning: The pump drive is pre-programmed to perform cleaning regularly.

ii. The cleaning function shall consist of forced stopping, reversal and forward runs timed to allow for debris to fall from the impeller. After cleaning cycle is complete, drive shall resume to automatic operation.

(d) Sump Cleaning Function:

i. The pump drive shall incorporate a sump cleaning function to ensure surface solids and grease is regularly removed from the sump. The sump cleaning function shall perform regularly when enabled by the operator. Sump cleaning shall consist of the following functions:

1. Sump cleaning is triggered when internal timer expires and during a normal pump down cycle
2. Pump is automatically ramped to maximum speed
3. Pump runs at maximum speed for designated time or until the pump are snoring."
4. When Sump Cleaning is over, the pump is shut off and resumes normal operation.

(e) Pipe Cleaning Function:

i. The pump drive shall incorporate a pipe cleaning function to avoid discharge pipe sedimentation and clogging due to reduced pump speed. This shall be an automatic feature that initiates with every pump cycle. Upon reaching Pump Start Level, the drive shall operate the pump at 100% speed for a determined time before ramping down to the most energy efficient speed for the duration of the cycle.

(f) Energy efficient speed finder:

i. The pump drive shall provide a function that automatically calculates the most energy efficient speed for the pump based on station inflow characteristics. An algorithm calculates the optimal speed whereby the most water is pumped using the least amount of energy, the optimal speed is constantly adjusted to account for changes inflow without requiring operator adjustment, multiple setpoints, etc.

ii. The energy efficient function prevents the drive from running off of the system curve for the pump. This will ensure maximum hydraulic efficiency as well as electrical efficiency is maintained.

(g) Alarms & Monitoring:

i. The pump drive shall provide alarms and monitoring for the drive, pump and sump. Alarms shall be presented on the LCD display, via a Summary Alarm relay and via Modbus registers. All alarms, when occurring, shall remain active until reset. Alarms shall have a built-in 4 second delay to prevent nuisance tripping. Alarms shall be as follows:

1. Pump Monitoring:
    a. Pump Over Temperature (thermal contacts in motor stator)
    b. Pump Seal Leak (Flygt FLS leakage sensor)

2. Sump Monitoring:
    a. High Sump Level (via level float switch or submersible transducer)
    b. Submersible transducer Sensor Error (Submersible transducer is not connected, reports faulty values or the wrong start level is used)

3. Pump drive Monitoring (includes, but not limited to):
    a. Drive Overcurrent
    b. Drive Overload Trip
    c. Drive Overvoltage
    d. Drive Undervoltage
    e. Drive Overtemperature (internal)
    f. Drive Overtemperature (ambient)
    g. Drive Undertemperature (ambient)
    h. Input Phase Loss
    i. Drive Output Max Torque Exceeded

D. Submersible Pressure Transducer

(a) The liquid level of the wet well shall be sensed by an MJK submersible level transducer. The transducer shall be a 2-wire type to operate from the level controller's regulated loop power supply and produce an instrumentation signal (4-20mA) in direct proportion to the measured level excursion over a factory-calibrated range of zero to (30) feet of water.

(b) The transducer shall be of the ceramic capacitive, relative pressure sensing type, suitable for continuous submergence and operation and shall be installed in accordance with manufacturer's instructions. The bottom diaphragm face of the sensor shall be installed approximately 6 inches above the wet well floor. The sensor shall be hung in the wet well using a cable bracket including two sliding cable locking jaws in a location in the wet well and as shown on the job plans.

(c) The transducer housing shall be fabricated of PPS (polyphenylene sulfide) with a ceramic bottom diaphragm.

(d) The transducer element shall incorporate high over-pressure protection and be designed to withstand intermittent overpressures (10) times the full-scale range being sensed. Metallic diaphragms shall not be acceptable in that they are subject to damage or distortion. Sensing principles employing LVDTs,

resistive or pneumatic elements shall not be acceptable.

(e) The internal pressure of the lower transducer assembly shall be relieved to atmospheric pressure through a heavy-duty urethane jacketed hose/cable assembly and a slack PVC bellows mounted in the control panel. The sealed breather system shall compensate for variations in barometric pressure and expansion and contraction of air due to temperature changes and altitude as well as prevent fouling from moisture and other corrosive elements.

(f) The transducer assembly shall be installed where directed by the Engineer and connected with other system elements and placed in successful operation.

(g) The transducer shall have a programming feature using a standard USB interface and a laptop computer, the servicing transmitter can be programmed on-the-fly to the required measuring range. The design without sharp edges prevents particles, textiles and paper from sticking to the housing or the diaphragm. The transducer shall be surge resistant.

(h) The transducer power cable shall be steel reinforced PUR cable with high tensile stretch.

1.03 CLOG FREE GUARANTEE

A. In addition to the manufacturer's warranty stated above, the pump manufacturer shall provide a (2) year clog free guarantee. If the pump clogs with typical solids and/or debris normally found in domestic wastewater during this period (within 24 months of pump station start-up), the manufacturer or the manufacturer's representative will reimburse the Owner for reasonable cost to remove the pump, clear the obstruction and reinstall the affected pump, or the manufacturer's representative will provide a service technician to perform this work at no cost to the Owner.

END OF SECTION

SUMMARY OF ESTIMATED QUANTITIES

ITEM No.	DESCRIPTION	UNIT	QUANTITY
101	MOBILIZATION	LS	1
102	PRECONSTRUCTION VIDEO SURVEY	LS	1
103	CLEARING AND GRUBBING	LS	1
104	REMOVAL OF PORTLAND CEMENT CONCRETE PAVEMENT	SY	45
105	DEMOLITION	LS	1
106	FILL AND GRADING	LS	1
107	MODIFICATIONS TO EXISTING WET WELL	LS	1
108	INSTALL YARD HYDRANT AND BACKFLOW PREVENTER	LS	1
109	2-INCH GAS LINE	LF	75
110	10" DIA. DI MJ GATE VALVE	EA	1
111	EXIST. 4" DIA. SFM CONNECTION	LS	1
112	EXIST. 6" DIA. SFM CONNECTION	LS	1
113	EXIST. EFFLUENT 8" DIA. SFM CONNECTION	LS	1
114	10" DIA. PVC SFM (DR18)(GREEN)	LF	52
115	12" DIA. PVC (SDR26)(GREEN)	LF	20
116	10' I.D.CONCRETE WET WELL	LS	1
117	ACCESS HATCH (48" X 72")(W/ FALL PROTECTION SYSTEM)	LS	1
118	SUBMERSIBLE PUMPS (INTERNAL COMPONENTS & INSTALLATION)	LS	1
119	8" DIA. DUCTILE IRON PIPE	LF	35
120	10" DIA. DUCTILE IRON PIPE	LF	7
121	CHECK VALVE (8")	EA	2
122	GATE VALVE (8")	EA	2
123	AIR RELEASE VALVE	EA	2
124	EMERGENCY PUMP OUT ASSEMBLY	LS	1
125	ELECTROMAGNETIC FLOWMETER	EA	1
126	DUCTILE IRON FITTINGS	LB	1,220
127	PIPE SUPPORT	EA	4
128	6" THICK PORTLAND CEMENT CONCRETE PAVEMENT	SY	94
129	AGGREGATE SURFACE COURSE	SY	155
130	ELECTRICAL CONDUIT AND WIRING	LS	1
131	CONTROL PANEL & SUPPORT STRUCTURE (W/METAL ROOF)	LS	1
132	STAND-BY NATURAL GAS GENERATOR (125kW)	LS	1
133	FREESTANDING JIB CRANE (1 TON)	LS	1
134	6' WOODEN FENCE	LF	52
135	6' CHAIN LINK FENCE & GATES	LF	90
136	SILT FENCE	LF	190
137	TEMPORARY BYPASS PUMP SYSTEM	LS	1
138	SITE RESTORATION	LS	1

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 LIMITS OF CONSTRUCTIONS AS SHOWN ON THE PLANS. THE CONTRACTOR'S STAGING AND STORAGE AREAS SHALL BE LOCATED WITH IN 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. ALL MATERIALS AND COMPONENTS OF THE WATER SYSTEM SHALL BE MANUFACTURED, PRODUCED OR OTHERWISE BE OF UNITED STATES OF AMERICA ORIGIN.
7. A TEMPORARY BENCHMARK HAS BEEN ESTABLISHED. THE HORIZONTAL AND VERTICAL LOCATION OF THE TEMPORARY BENCHMARK IS AS FOLLOWS

   NORTHING: 655176.0404
   EASTING: 3791320.3897
   ELEVATION: 12.6'

8. THE CONTRACTOR SHALL USE THE HORIZONTAL AND VERTICAL CONTROLS ESTABLISHED FOR PROJECT.
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. 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.
12. 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
SHAUN BORDELON
(504) 214–6361

CLECO
KEMP HARTZOG
(985) 867–4638

13. THE CONTRACTOR SHALL VERIFY THE REQUIRED HORIZONTAL AND VERTICAL CLEARANCES WITH THE RESPECTIVE UTILITY OWNER PRIOR TO BEGINNING WORK.
14. CONCERNS REGARDING THE DEPARTMENT OF UTILITIES FACILITIES SHALL BE DIRECTED TO THE FOLLOWING PERSON:

FIELD OPERATIONS SUPERVISOR
(985) 893–1717

15. 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.
16. LOCATIONS OF UTILITIES IDENTIFIED BY 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.
17. SERVICE INTERRUPTIONS ASSOCIATED WITH FINAL CONNECTIONS, IF ANY, 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.
18. CUSTOMERS AFFECTED BY THE PLANNED SERVICE INTERRUPTION SHALL BE NOTIFIED IN WRITING 48 HOURS IN ADVANCE OF APPROVED SERVICE OUTAGE DATE.
19. 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.
20. 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 DAILY BASIS. DEBRIS OR TRASH SHALL BE STORED IN REFUSE CONTAINERS OR BINS UNTIL REMOVAL FROM THE SITE.

HIGH TIDE CONSULTANTS LLC
409 W 21ST AVENUE – SUITE B
COVINGTON, LA 70433
www.hightidela.com

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

No.	DESCRIPTION OF REVISION	DATE:
1	ADDENDUM NO. 1	4/17/24

DESIGNED BY: THA
DRAWN BY: KRG
CHECKED BY: RCG
SUBMITTED BY: HIGH TIDE CONSULTANTS
PROJECT No.: TU23000173
ISSUE DATE: 3/8/24 (BID)
APPROVED BY: RCG
SHEET SIZE: ANSI D
SCALE: AS SHOWN

STATE OF LOUISIANA
RICHARD GALLOWAY
REG. No. 28543
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
04/17/2024

HIGHWAY LA–21 LIFT STATION
WST SEWER SYSTEM
MADISONVILLE, LOUISIANA
PROJECT No.: TU23000173

GENERAL NOTES

SHEET NO.
2
SHEET 2 of 22

NOTES

1. PRIOR TO BEGINNING WORK, CONTRACTOR SHALL CONFIRM SIZE AND LOCATION OF EXISTING SEWER FORCE MAIN AND WATER LINE. IF INCONSISTENCIES OCCUR BETWEEN PLANS AND FIELD VERIFICATIONS, CONTRACTOR SHALL COORDINATE WITH PARISH PRIOR TO CONSTRUCTION.
2. SEE DETAIL SHEETS FOR REQUIRED REINFORCEMENT INFORMATION ON JIB CRANE AND GENERATOR PADS.

LEGEND - REQUIRED

- SFM — SEWER FORCE MAIN
- 6" PORTLAND CEMENT CONCRETE PAVEMENT
- 1 — AGGREGATE SURFACE COURSE
- W — WATERLINE
- 6' CHAINLINK FENCE
- 6' WOODEN FENCE
- G — GAS LINE

EXIST. 8" Ø EFFLUENT SEWER FORCE MAIN
TIE REQ'D 10" Ø SEWER FORCE MAIN INTO EXIST. 8" FORCE MAIN (SEE DETAIL)
REQ'D 2" GAS LINE
REQ'D 10" SEWER GATE VALVE (TYP)
REQ'D 10" Ø SEWER FORCE MAIN
REQ'D CONTROL PANEL w/ METAL ROOF (SEE DETAIL)
REQ'D 6' CHAINLINK FENCE
EXIST. 4"Ø SEWER FORCE MAIN (PVC)
EXIST. RIGHT OF USE SERVITUDE AREA (+/- 0.012 AC)
REQ'D JIB CRANE. 1 TON CAPACITY, 20' SPAN, 15 HEIGHT UNDER BOOM. GORBEL FS300-18-W16 OR APPROVED EQUAL
LIMITS OF JIB CRANE BEAM REACH
EXIST. 8' WET WELL (TO REMAIN)
TIE IN 6" Ø SEWER FORCE MAIN TO EXIST. 6"Ø SEWER FORCE MAIN (PVC) (SEE DETAIL)
REQ'D NON-FREEZE HOSE BIB
REQ'D 90° BEND
REQ'D 1" WATERLINE
REQ'D EPO CONNECTION
REQ'D PIPE SUPT. (TYP.)
REQ'D PCC PAVEMENT (6" TK.) AND BACKFILL
TIE REQ'D 4" Ø SEWER FORCE MAIN INTO EXIST. 4"Ø SEWER FORCE MAIN (PVC) (SEE DETAIL)
EXIST. 6"Ø SEWER FORCE MAIN FROM CHRISTWOOD (PVC)
REQ'D RIGHT OF USE SERVITUDE AREA (+/-0.02AC)
EXIST. WATER METER
REQ'D BACKFLOW PREVENTER
REQ'D (2) 12" Ø GRAVITY SEWER PIPES AT 1.00% (MIN.)
REQ'D 125kW NATURAL GAS STAND-BY GENERATOR
REQ'D VENT PIPE
REQ'D 6' WOODEN FENCE
EXIST. 6" Ø SEWER FORCE MAIN FROM ARBOR WALK/NATCHEZ TRACE (PVC)
REQ'D CHAINLINK DOUBLE GATE (16' W)
REQ'D DOUBLE ACCESS HATCH
REQ'D CONCRETE WET WELL
EXIST. ACCESS AND UTILITY SERVITUDE AREA
REQ'D CHAINLINK GATE (8' W)
LA HWY 21
CHRIST EPISCOPAL CHURCH IN COVINGTON (Not A Part)

SITE LAYOUT PLAN

SCALE IN FEET
5 2.5 0 5 10 15

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ST. TAMMANY PARISH GOVERNMENT

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APPROVED BY:	RCG
SHEET SIZE:	ANSI D
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STATE OF LOUISIANA
RICHARD GALLOWAY
REG. No. 28545
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
04/17/2024

HIGHWAY LA-21 LIFT STATION
WST SEWER SYSTEM
MADISONVILLE, LOUISIANA
PROJECT No.: TU23000173

SITE LAYOUT PLAN

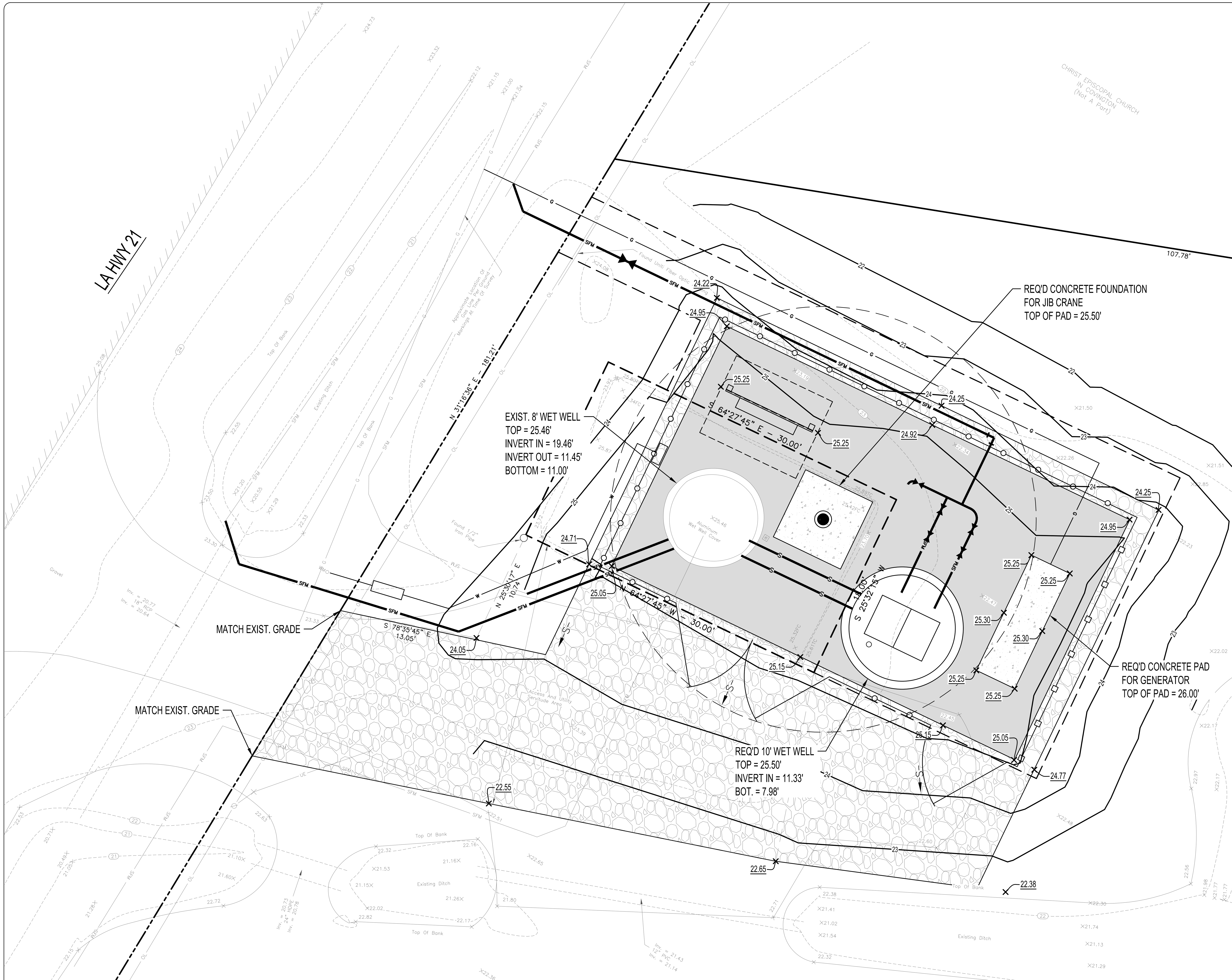
SHEET NO.
10
SHEET 10 of 23

NOTES

1. PRIOR TO BEGINNING WORK, CONTRACTOR SHALL CONFIRM SIZE AND LOCATION OF EXISTING SEWER FORCE MAIN AND WATER LINE. IF INCONSISTENCIES OCCUR BETWEEN PLANS AND FIELD VERIFICATIONS, CONTRACTOR SHALL COORDINATE WITH PARISH PRIOR TO CONSTRUCTION.
2. CONTRACTOR SHALL GRASS BY HYDROSEEDING AND/OR SODDING ALL DISTURBED AREAS FROM GRADING AND OTHER CONSTRUCTION ACTIVITIES. GRASS WILL BE MAINTAINED AND WATERED UNTIL ACCEPTED BY THE OWNER. CONTRACTOR IS RESPONSIBLE FOR OBTAINING SUBSTANTIAL GROWTH OF ALL SEED. THIS WILL BE PAID FOR UNDER ITEM 137 - SITE RESTORATION.

LEGEND - REQUIRED

Symbol	Description
SFM	SEWER FORCE MAIN
(grey fill)	6" PORTLAND CEMENT CONCRETE PAVEMENT
(stone fill) 1	AGGREGATE SURFACE COURSE
X 25.40	SPOT ELEVATION
←S–	SLOPE GRADE DIRECTION
—23—	GRADING CONTOUR
—W—	WATERLINE
—o—o—	6' CHAINLINK FENCE
—□—□—	6' WOODEN FENCE
—G—	GAS LINE



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GRADING PLAN

SCALE IN FEET
5 2.5 0 5 10 15

ST. TAMMANY PARISH GOVERNMENT

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STATE OF LOUISIANA
RICHARD GALLOWAY
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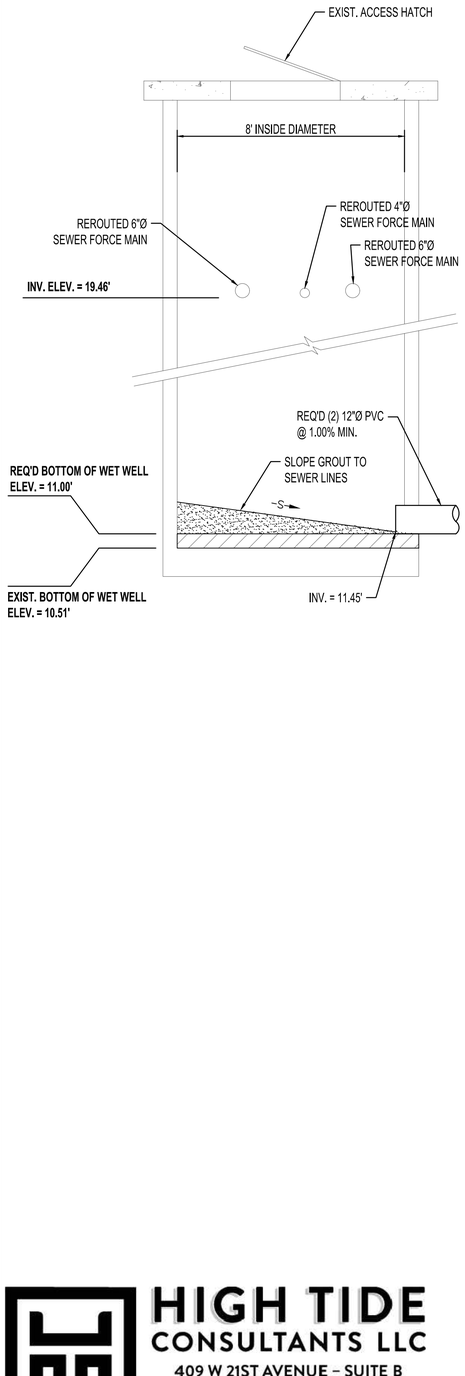
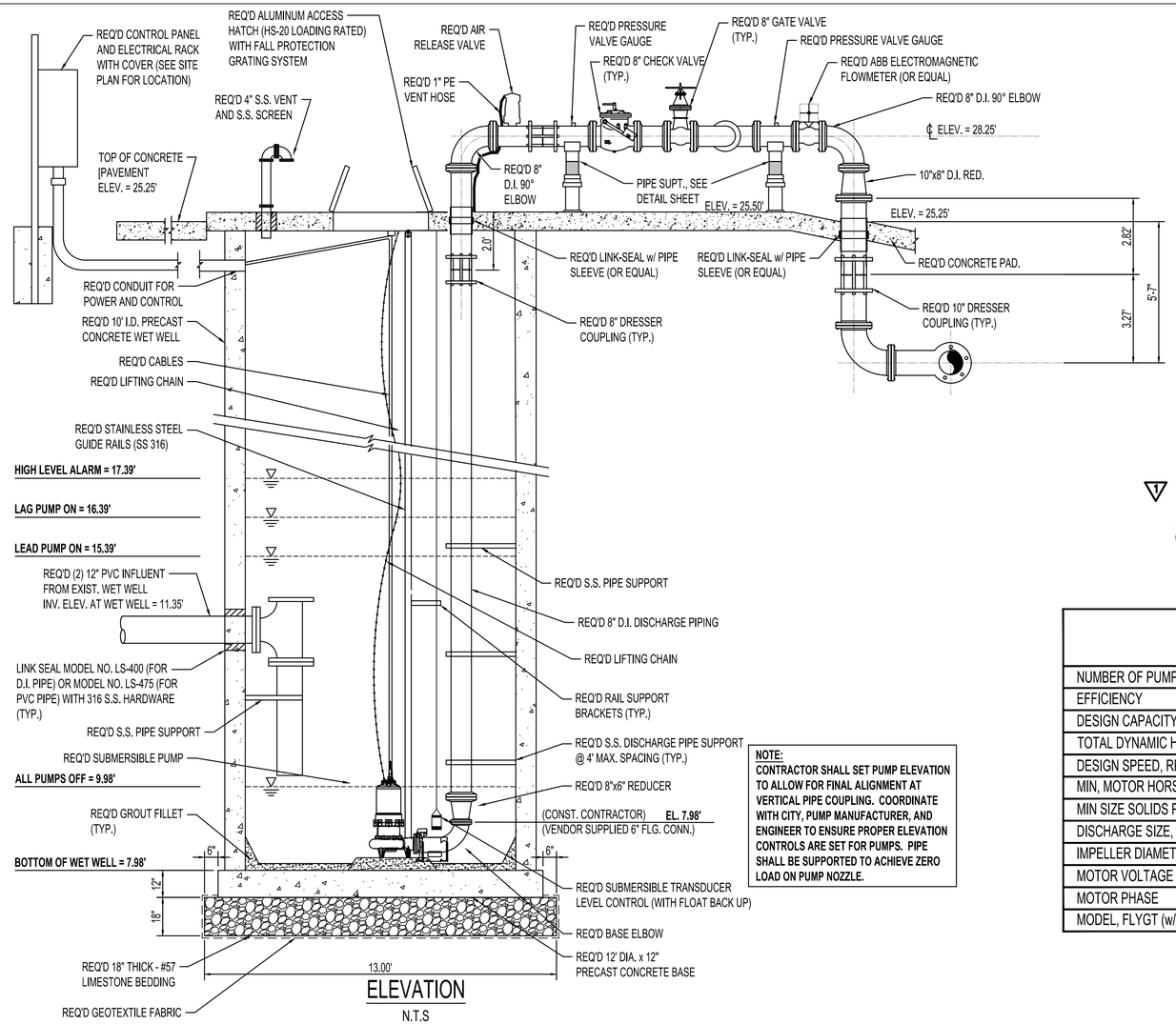
REGISTERED PROFESSIONAL ENGINEER
IN CIVIL ENGINEERING
04/17/2024

HIGHWAY LA-21 LIFT STATION
WST SEWER SYSTEM
MADISONVILLE, LOUISIANA
PROJECT No.: TU23000173

GRADING PLAN

SHEET NO.
11

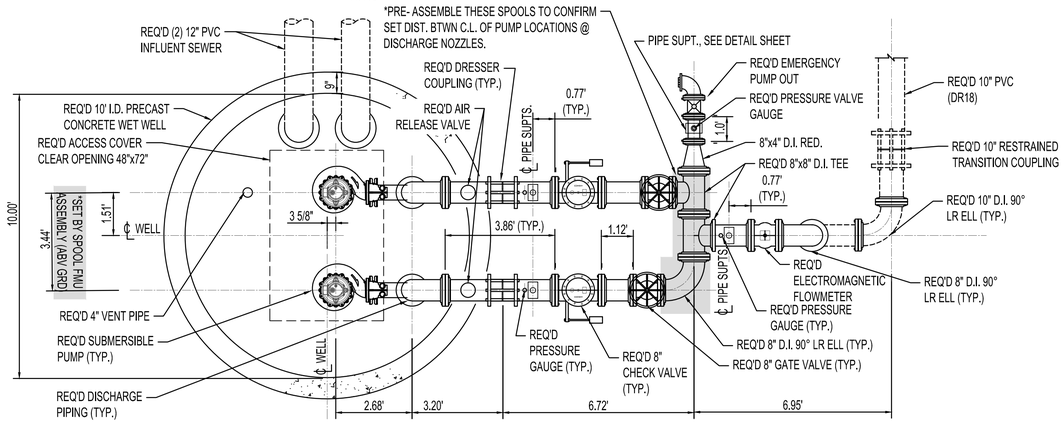




ELEVATION

N.T.S

NOTE:
CONTRACTOR SHALL SET PUMP ELEVATION TO ALLOW FOR FINAL ALIGNMENT AT VERTICAL PIPE COUPLING. COORDINATE WITH CITY, PUMP MANUFACTURER, AND ENGINEER TO ENSURE PROPER ELEVATION CONTROLS ARE SET FOR PUMPS. PIPE SHALL BE SUPPORTED TO ACHIEVE ZERO LOAD ON PUMP NOZZLE.



PLAN

N.T.S

NOTES

1. PUMPS, GUIDE RAILS, BASE ELBOWS, AND ACCESS HATCHES SHALL BE SUPPLIED BY THE PUMP SUPPLIER, OR CERTIFIED AS COMPATIBLE BY THE RESPECTIVE MANUFACTURERS.
2. THE PRECISE LOCATION OF HATCHES, AND LOCATION/ SPACING OF PUMPS, GUIDE RAILS, AND BASE ELBOWS, SHALL BE AS RECOMMENDED BY THE MANUFACTURER.
3. ALL GUIDE RAILS, BRACKETS, CHAINS, LIFTING CABLES, BOLTS, NUTS, FASTENERS, AND ANY HARDWARE WITHIN THE WET WELL SHALL BE TYPE 316 STAINLESS STEEL.
4. ALL INTERNAL PIPING AND FITTINGS SHALL BE FLANGED DUCTILE IRON. PIPING SHALL BE INDEPENDENTLY SUPPORTED BY 316 STAINLESS STEEL ASSEMBLIES. THE THROUGH-WALL MECHANICAL SEALS SHALL NOT BE RELIED UPON FOR WEIGHT BEARING OR THRUST RESTRAINT.
5. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW OF A COMPLETE SET OF SHOP DRAWINGS OF EACH STRUCTURE AND FOR ALL EQUIPMENT IN THE WET WELL AND ABOVE GROUND FOR THE DISCHARGE PIPING SEPARATELY DETAILING DIMENSIONS, PIPE/ VALVES CLEARANCE, SIZES AND ANY OTHER NECESSARY DETAILS.
6. NON-BURIED PIPES, VALVES, AND FITTINGS SHALL BE COATED IN ACCORDANCE WITH SECTION 09800.
7. BEDDING MATERIAL SHALL BE 18" THICK COMPACTED LIMESTONE UNDERLAIN BY GEOTEXTILE FABRIC (GEOTEX 200ST OR EQ.)
8. ACCESS HATCHES AND GRATING SYSTEM SHALL MEET THE REQUIREMENTS OF OSHA STANDARD 29 CFR 1926.502(C). HOLD OPEN DEVICE AND HARDWARE SHALL BE TYPE 316 STAINLESS STEEL, HATCH AND GRATE SHALL BE BILCO OR EQUAL APPROVED BY ENGINEER.
9. CONTRACTOR SHALL PLUMB AND RETURN AIR RELEASE VENT HOSE TO DISCHARGE INTO THE WET WELL.
10. VENT PIPE, PRESSURE GAUGE CONNECTIONS, PIPE SUPPORTS, AND VENT PIPE WALL PENETRATIONS SHALL BE IN ACCORDANCE WITH DETAILS SHOWN IN THE DETAIL SHEETS.
11. REQUIRED BACKFILL MATERIAL SHALL BE COMPACTED GRANULAR MATERIAL (RIVER SAND), MIN. DENSITY 95% STANDARD PROCTOR (ASTM D698), PLACED IN 12" MAX LAYERS. THE EXCAVATION AND BACKFILL REQUIREMENTS APPLY PER SECTION 02300. WORK AND BACKFILL SHALL BE INCLUDED UNDER ITEM NO. 116 - 10' I.D. CONCRETE WET WELL.

PUMP DATA TABLE

NUMBER OF PUMPS	2
EFFICIENCY	73.2%
DESIGN CAPACITY PER PUMP, GPM	850
TOTAL DYNAMIC HEAD, FEET	120
DESIGN SPEED, RPM	1775
MIN, MOTOR HORSEPOWER PER/PUMP	60
MIN SIZE SOLIDS PASSED, INCH	3"
DISCHARGE SIZE, INCH	6"
IMPELLER DIAMETER, MM	310
MOTOR VOLTAGE	460
MOTOR PHASE	3
MODEL, FLYGT (w/ SMART RUN CONTROLLER) OR APPROVED EQUAL	NP 3202 HT3~458

HIGH TIDE CONSULTANTS LLC
409 W 21ST AVENUE – SUITE B
COVINGTON, LA 70433
www.hightidela.com
HTC PROJ# 23-161

LIFT STATION PLAN AND ELEVATION

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

No.	DESCRIPTION OF REVISION	DATE:
1	ADDENDUM NO. 1	4/17/24

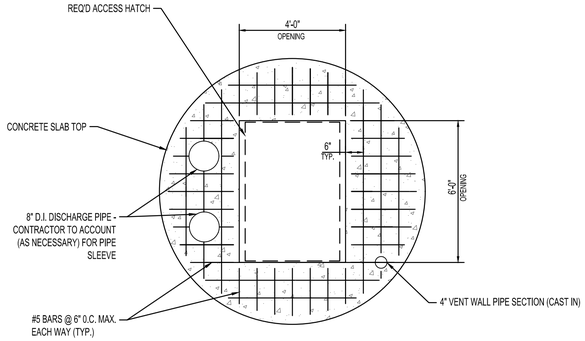
DESIGNED BY: THA
DRAWN BY: KRG
CHECKED BY: RCG
SUBMITTED BY: HIGH TIDE CONSULTANTS
PROJECT No.: TU23000173
ISSUE DATE: 3/8/24 (BID)
APPROVED BY: RCG
SHEET SIZE: ANSI D
SCALE: AS SHOWN

STATE OF LOUISIANA
RICHARD GALLOWAY
REG. No. 29243
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
4/17/2024

HIGHWAY LA-21 LIFT STATION
WST SEWER SYSTEM
MADISONVILLE, LOUISIANA
PROJECT No.: TU23000173

LIFT STATION
PLAN AND ELEVATION

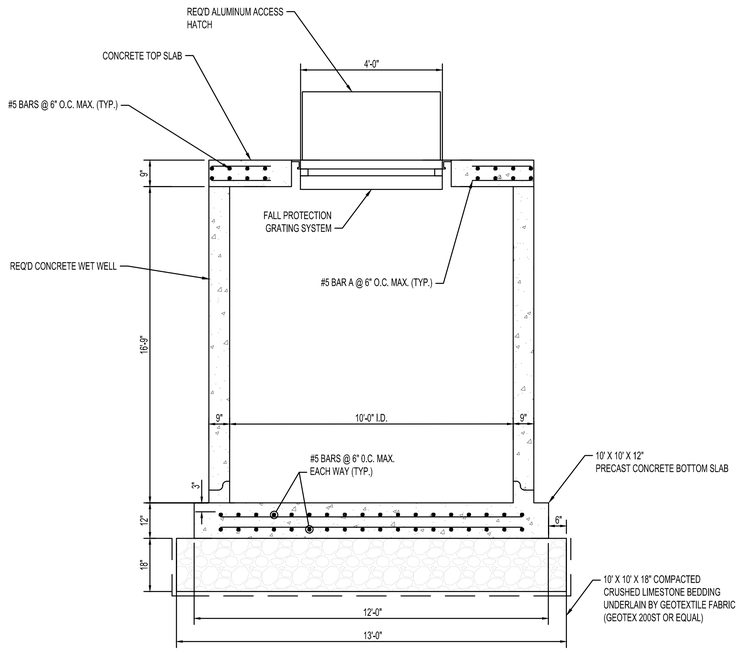
SHEET NO.
12
SHEET 12 of 23



WET WELL

TOP SLAB PLAN

N.T.S.



WET WELL ELEVATION

N.T.S.

NOTES:

1. CONCRETE SHALL BE CLASS A OR CLASS P ACCORDING TO LA DOTD LSSRB, 2016 EDITION, AS APPLICABLE. REINFORCING STEEL SHALL BE 60 KSI.
2. PROVIDE CONCRETE COVER OVER REINFORCING STEEL IN ACCORDANCE WITH ACI 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, BUT IN NO CASE LESS THAN 2".
3. PROVIDE 3/4" CHAMFER ON EXPOSED CONCRETE EDGES.
4. HATCH FRAMES SHALL BE INTEGRALLY CAST WITH COVERS.
5. CONTRACTOR SHALL SUBMIT SHOP DRAWING SHOWING STEEL REINFORCEMENT, CONCRETE SLABS, WET WELL, HATCH OPENINGS, PIPE OPENINGS, AND ANY OTHER NECESSARY DETAILS.
6. STRUCTURAL BACKFILL AND BEDDING MATERIAL SHALL CONSIST OF SELECT MATERIAL, DEPOSITED IN LIFTS OF 8-10" OF LOOSE MATERIAL. EACH LIFT SHALL BE SATISFACTORILY COMPACTED TO PLACEMENT OF OTHER LIFTS. SEE SPECIFICATIONS.
7. THE PORTION OF THE HATCH FRAME WHICH IS IN CONTACT WITH CONCRETE SHALL RECEIVE BITUMINOUS PROTECTIVE COATING.
8. ACCESS HATCH SHALL BE DOUBLE LEAF TYPE AND MEET THE REQUIREMENTS OF H-20 LOADING. THE ACCESS HATCH SHALL INCLUDE A FALL PROTECTION GRATING SYSTEM.
9. HATCHES SHALL BE LOCATED TO PROVIDE GENEROUS ACCESS TO PUMPS AND VALVES, AS APPROVED BY THE ENGINEER. CONTRACTOR SHALL ADJUST CONCRETE AND REINFORCING BY SHOP DRAWING IF DIFFERENT HATCH OPENING SIZE IS APPROVED BY THE ENGINEER.

HIGH TIDE CONSULTANTS LLC
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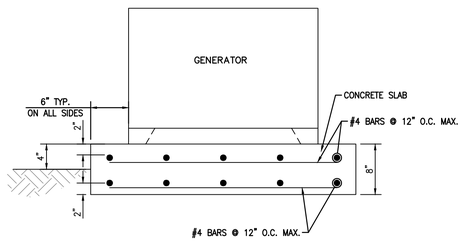
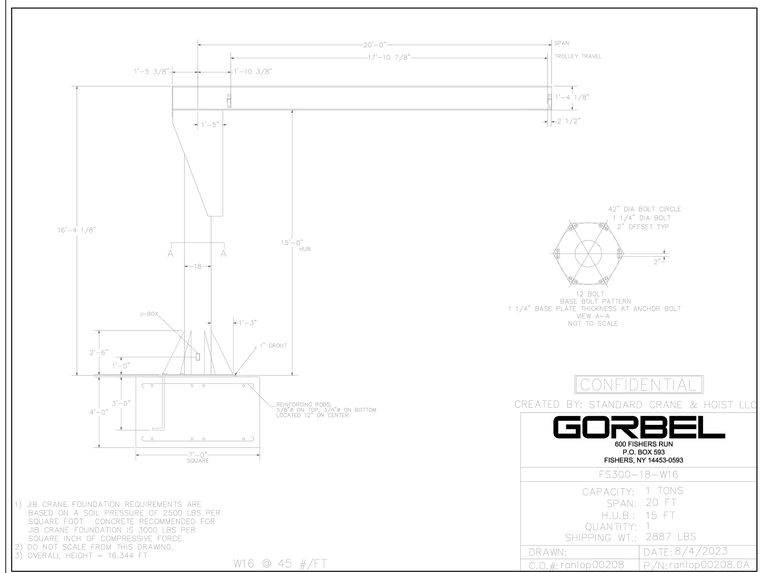


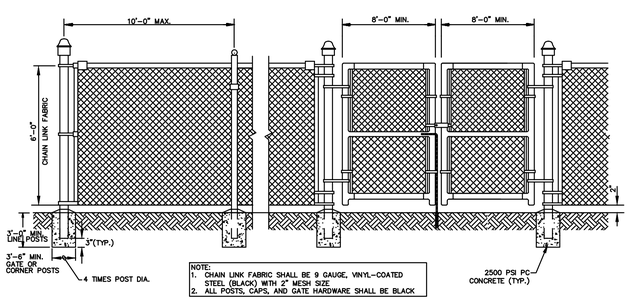
GENERATOR PAD SLAB

N.T.S.

NOTES:

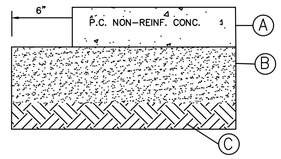
1. PROVIDE BLOCK-OUTS FOR CONDUITS AS REQUIRED. COORDINATE CONFIGURATION WITH ELECTRICAL REQUIREMENTS.
2. PROVIDE ¾" CHAMFER ON EXPOSED EDGES





CHAIN LINK FENCE W/16' DOUBLE GATE

N.T.S.

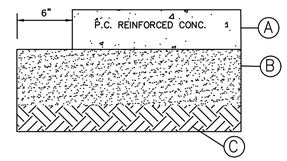


STANDARD DUTY CONCRETE PAVEMENT

A. 6" MIN. OF PORTLAND CEMENT CONCRETE PAVEMENT (PCCP). PCCP SHALL BE TYPE B COMPLYING WITH REQUIREMENTS OF SECTION 901 OF LSSRB, LATEST EDITION

B. 12" (MIN. OR AS NECESSARY TO ACHIEVE REQUIRED GRADE) COMPACTED GRANULAR STRUCTURAL FILL (SAND)

C. PROPERLY PREPARED SUBGRADE



GENERATOR PAD PAVEMENT

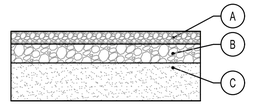
A. 8" MIN. OF REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT (PCCP). PCCP SHALL BE TYPE B COMPLYING WITH REQUIREMENTS OF SECTION 901 OF LSSRB, LATEST EDITION. (REINFORCING SHALL BE #4 BARS AT 18" O.C. EACH WAY.)

B. 12" COMPACTED GRANULAR FILL (SAND)

C. PROPERLY PREPARED SUBGRADE

PAVEMENT NOTES (ALL SECTIONS):

1. ALL PAVEMENT, BASE, FILL MATERIAL, AND SITE AND BUILDING PAD PREPARATION SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT RECOMMENDATIONS. REPORT PREPARED BY STRATUM ENGINEERING, LLC DATED 8/14/2023.
2. THE EXPOSED SUBGRADE SHOULD BE PROOF-ROLLED WITH A RUBBER TIRED VEHICLE WEIGHING 20 TONS. SOILS WHICH ARE OBSERVED TO RUT OR DEFLECT EXCESSIVELY UNDER THE MOVING LOAD SHALL BE UNDERCUT AND REPLACED WITH COMPACTED STRUCTURAL FILL.
3. GRANULAR FILL SHALL CONSIST OF SAND MEETING THE EMBANKMENT FILL REQUIREMENTS OF LSSRB, SECTION 1003.07.
4. GRANULAR FILL SHALL BE PLACED IN MAXIMUM 8" LOOSE LIFTS AND COMPACTED TO 95% MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 698 (STANDARD PROCTOR) WITHIN 3% OF OPTIMUM MOISTURE CONTENT.

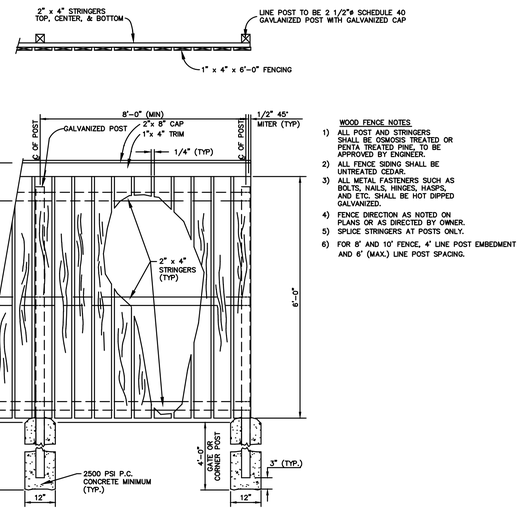


A. 4" COMPACTED 610 LIMESTONE COMPACTED TO 95% OF ITS DRY DENSITY AS DETERMINED BY ASTM D-698, STANDARD PROCTOR TEST WITH STABILITY PRESENT.

B. 6" COMPACTED #57 LIMESTONE

C. PROOF-ROLLED EXISTING SUBGRADE OR COMPACTED STRUCTURAL FILL

AGGREGATE SURFACE COURSE



WOOD FENCE NOTES

1) ALL POST AND STRINGERS SHALL BE OSMOSIS TREATED OR PENTA TREATED PINE, TO BE APPROVED BY ENGINEER.
2) ALL FENCE SIDING SHALL BE UNTREATED CEDAR.
3) ALL METAL FASTENERS SUCH AS BOLTS, NAILS, HINGES, HASPS, AND ETC. SHALL BE HOT DIPPED GALVANIZED.
4) FENCE DIRECTION AS NOTED ON PLANS OR AS DIRECTED BY OWNER.
5) SPLICE STRINGERS AT POSTS ONLY.
6) FOR 8' AND 10' FENCE, 4" LINE POST EMBEDMENT AND 6' (MAX.) LINE POST SPACING.

WOOD FENCE

N.T.S.

DETAILS

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

No.	DESCRIPTION OF REVISION	DATE:
1	ADDENDUM NO. 1	4/17/24

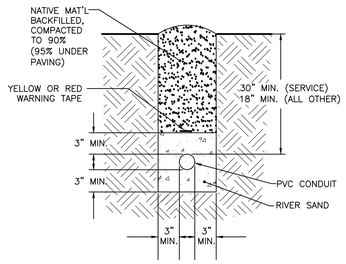
DESIGNED BY:	THA
DRAWN BY:	KRG
CHECKED BY:	RCG
SUBMITTED BY:	HIGH TIDE CONSULTANTS
PROJECT No.:	TU23000173
ISSUE DATE:	3/8/24 (BID)
APPROVED BY:	RCG
SHEET SIZE:	ANSI D
SCALE:	AS SHOWN

RICHARD GALLOWAY
REG. No. 28543
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
STATE OF LOUISIANA
04/17/2024

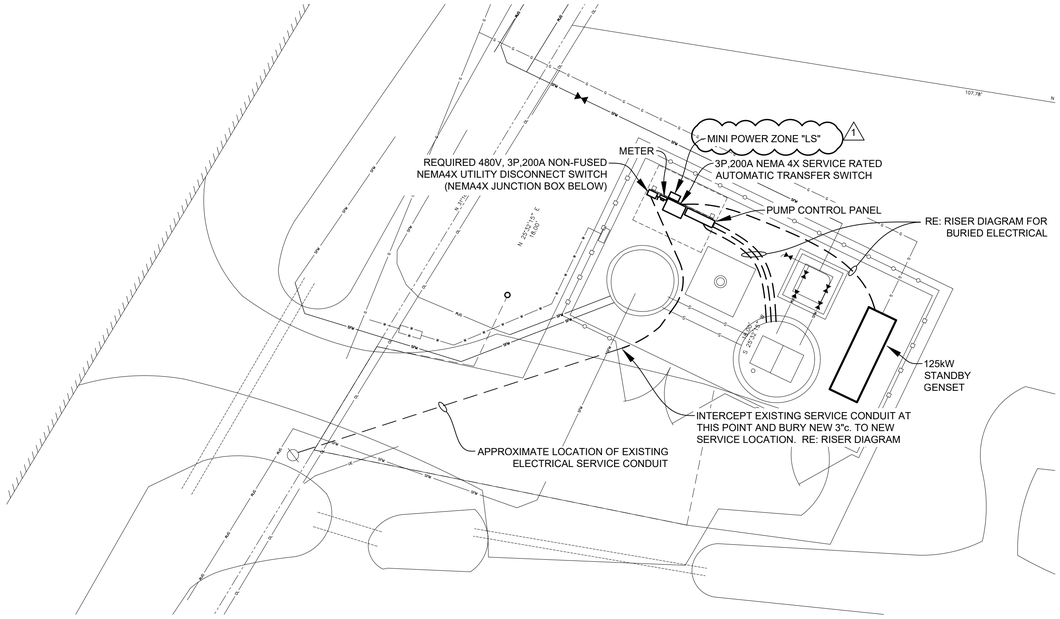
HIGHWAY LA-21 LIFT STATION
WST SEWER SYSTEM
MADISONVILLE, LOUISIANA
PROJECT No.: TU23000173

DETAILS

SHEET NO.
13
SHEET 13 of 23



CONDUIT BURIAL DETAIL



LA-21 PUMP STATION
ELECTRICAL PLAN

SCALE IN FEET

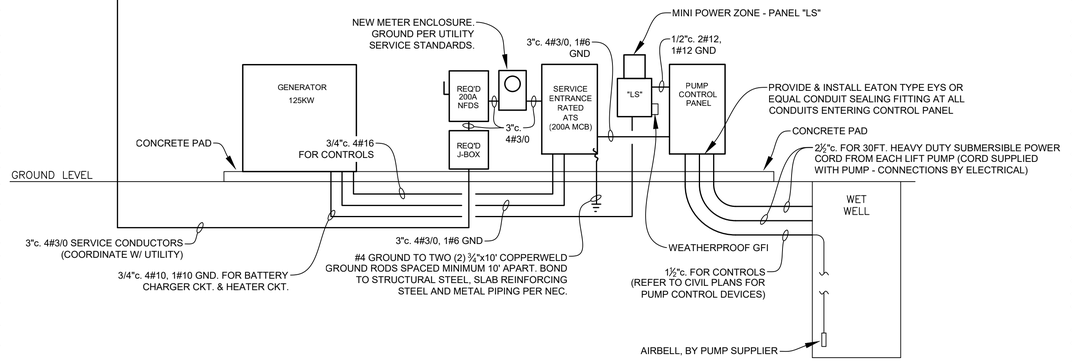
10 5 0 10 20 30

PANEL: "LS"	480V PRIMARY, 120/240V SECONDARY 1 PH, 3W NEMA 3R, 5kVA TRANSFORMER						20A PRIMARY MAIN BREAKER 30A SECONDARY MAIN BREAKER				
POLE SPC.	CKT. NO.	POLES -TRIP	WIRE SIZE	CIRCUIT LOAD	CONN. LOAD A	CONN. LOAD B	CIRCUIT LOAD	WIRE SIZE	POLES -TRIP	CKT. NO.	POLE SPC.
1	1	1-20	12	WP GFI RECEP	180 / 1500		GEN. BLOCK HEATER	10	1-20	2	2
3	3	1-20	-	SPARE		180	GEN. BATTERY CHARGER	10	1-20	4	4
5	-	-		SPACE			SPACE	-	-	-	6
7											8
9											10

SQUARE D MPU5S40F MINI POWER ZONE OR APPROVED EQUAL

GENERAL NOTES:

1. ANCHOR GENERATOR SECURELY TO CONCRETE PAD.
2. REFER TO CONTROL DIAGRAMS ON CIVIL PLANS FOR FIELD WIRING INDICATED BY DASHED LINES & CONNECTIONS REQUIRED BY ELECTRICAL CONTRACTOR.
3. ELECTRICAL EQUIPMENT SHALL BE MOUNTED TO STRUCTURE PROVIDED. REFER TO CIVIL PLANS FOR STRUCTURE DETAILS.



RISER DIAGRAM

LA One Call 811

CASTAGNOS GOODWIN UTLEY ENGINEERS, L.L.C.
CONSULTING MECHANICAL & ELECTRICAL ENGINEERS
SCHRIEVER, LA

ST. TAMMANY PARISH GOVERNMENT

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

No.	DESCRIPTION OF REVISION	DATE:
1	ADDENDUM #1 - ADD PANEL "LS"	4/17/2024

DESIGNED BY:	BCC
DRAWN BY:	BCC
CHECKED BY:	BCC
SUBMITTED BY:	HIGH TIDE CONSULTANTS
PROJECT No.:	TU23000173
ISSUE DATE:	3/8/2024
APPROVED BY:	BCC
SHEET SIZE:	ANSI D
SCALE:	

STATE OF LOUISIANA
BRANDON C. CORTEZ
License No. 44125
PROFESSIONAL ENGINEER

HIGHWAY LA-21 LIFT STATION
WST SEWER SYSTEM
MADISONVILLE, LOUISIANA
PROJECT No.: TU23000173

ELECTRICAL PLAN

SHEET NO.
46
SHEET 46 of 46