ADDENDUM NO. 2
TO THE
BIDDING REQUIREMENTS AND CONTRACT DOCUMENTS
FOR THE
LIFT STATION AND FORCE MAIN IMPROVEMENTS

OWNER: Town of Montgomery

ISSUED BY/ENGINEER: Egis BLN USA, Inc.
8320 Craig Street
Indianapolis, Indiana 46250

ISSUED TO: All Plan and Specifications Holders of Record

ISSUE DATE: December 10, 2024

BID DATE: December 12, 2024

This Addendum No. 2, consisting of 3 pages, shall clarify, correct, or change the Bidding Requirements or the proposed Contract Documents. This Addendum is a part of the Bidding Requirements and the proposed Contract Documents and shall govern in the performance of the Work.

PART 1 - PROJECT MANUAL

1.1 ITEM NO. 1 – SECTION 11310 – SUBMERSIBLE LIFT STATION

A. Replace with attached revised section. Deletions were made by strikethrough and additions in bold.

1.2 ITEM NO. 2 – SECTION 265600 – EXTERIOR LIGHTING

A. Insert attached specification.

PART 2 - DRAWINGS

2.1 ITEM NO. 3 – DRAWING E600

A. See revised drawing attached.

B. Revised to show route of the secondary service connection to an existing – to remain – pad mounted transformer by utility. Note #16 added - "Reconnect to existing Pad-Mount Transformer."

2.2 ITEM 4 – DRAWING E601

A. See revised attached drawing

B. Note #1 – Revised to indicate an existing Pad-Mount Transformer

C. Note #2 – Revised to "(2) Parallel Runs of 4-#3/0 CU, 2" C ea."

D. Note #7 – Revised to "(2) Parallel Runs of 4-#3/0 CU, 1-#3 GND, 2-1/2" C. each"

E. Note #13—Revised to "3-#2 CU, 1-#6 CU Gnd. for Pump Wiring, Seal Fail, Overtemp Cables, and Pump Wiring Installed in Common 2" C; one 2" C for each pump."

F. Note #19 – Revised to "400A, 240V, 1 Ph, NF, 2P-DT Manual Selector Switch with insulated neutral block and equipment ground block, NEMA 4 Painted Steel enclosure, minimum 14KAIC."

G. Note #20 – Revised to "(2) Parallel Runs of 3-#3/0, 1-#3 Equipment Gnd., 2" C, each."

2.3 ITEM NO. 5 – DRAWING E603

A. See revised attached drawing.

B. Revised to show route of the secondary service connection to an existing – to remain – pad mounted transformer by utility. Note #15 added - "Reconnect to existing Pad-Mount Transformer."

2.4 ITEM 6 – DRAWING E604

A. See revised attached drawing.

B. Note #1 – Revised to indicate an existing Pad-Mount Transformer

C. Note #2 – Revised to "3-#3/0 CU, 2"C."

D. Note #7 – Revised to "3-#3/0 CU, 1-#6 CU Gnd., 2" C."

E. Note #13—Revised to "3-#6 CU, 1-#8 CU Gnd. for Pump Wiring, Seal Fail, Overtemp Cables, and Pump Wiring Installed in Common 2" C; one 2" C for each pump."

F. Note #19 – Revised to "200A, 240V, 1 Ph, NF, 2P-DT Manual Selector Switch with insulated neutral block and equipment ground block, NEMA 4 Painted Steel enclosure, minimum 14KAIC."

G. Note #20 – Revised to "3-#3/0 CU, 1-#6 CU Equipment Gnd., 2" C."

PART 3 - ADDITIONAL TECHNICAL INFORMATION – NOT APPLICABLE

The following technical information is not part of the Contract Documents, but Bidder is entitled to rely upon this "technical data" as provided in Paragraph 4.02 of the General Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any "technical data" or any other data, interpretations, opinions or information contained in such information.

Except as modified by this Addendum and other Addenda, the Bidding Requirements and the proposed Contract Documents shall remain unchanged. You will receive no other notification of this Addendum. **RECEIPT OF THIS ADDENDUM MUST BE ACKNOWLEDGED IN SECTION 00410 - BID FORM, PAGE 00410-1.**

CERTIFIED BY:

Brian A. Bullock, P.E.
Registered P.E. No. 10302266
State of Indiana

Encls.: Section 11310 of the project manual
Section 265600 of the project manual
Plan sheets E600-E605

SECTION 11310
SUBMERSIBLE LIFT STATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes submersible lift station structures and equipment, including:

1. Wet wells and valve vaults.
2. Pumps.
3. Guide rails and pump removal components.
4. Site Piping and Valves.
5. Pump control system.
6. Alarm dialer.
7. Hatches.
8. Control panel.

B. Related sections include the following:

1. Section 02240 – Dewatering for dewatering requirements.
2. Section 02260 – Excavation Support and Protection for excavation support and protection requirements.
3. Section 02300 – Earthwork for excavating, trenching, bedding and backfill, and pipe identification material.
4. Section 02545 -- Sewer Force Mains for connecting sewer force mains.
5. Section 02700 – Bases and Pavements for site drives.
6. Section 07721 – Hatches for hatches in valve vault structures.
7. Division 16 for electrical requirements.

C. Related regulations include the following:

1. 327 IAC 3-6-9 for separation requirements with water mains and wells.

1.2 ACRONYMS

A. AFBMA – Anti-Friction Bearing Manufacturers Association

B. NEC – National Electric Code

C. FM – Factory Mutual

D. ANSI - American National Standards Institute.

E. ASTM - American Society for Testing & Materials.

F. HI - Hydraulic Institute.

G. NEMA - National Electric Manufacturer's Association

H. NFPA – National Fire Protection Association

I. UL – Underwriters Laboratories

1.3 SYSTEM REQUIREMENTS

A. Design Requirements

1. Submersible pumps shall be capable of meeting the following design criteria:

a.	Number of Pumps:	2 Pumps
b.	Primary Design Flow:	400 GPM (Walker and Petty LS)
c.	Primary Design Head:	53’ TDH (Walker LS) and 75’ TDH (Petty LS)
d.	Minimum Shut-off Head:	75’ TDH (Walker LS) and 91’ TDH (Petty LS)
	Motor Horsepower:	~~15~~ **10** HP Minimum (Walker LS) and 20 HP minimum (Petty LS)
e.	Motor Speed:	1750 RPM
f.	Electrical:	230 Volt, 3 phase, 60 Hz
g.	Pumped Material:	Raw Sewage

1.4 SUBMITTALS

A. Action Submittals

1. Product List
   a. Recommended spare parts list.
2. Product Data

a. Manufactured control system products.
b. Pumps and motors, including:
    1) Size, type, design, and model.
    2) Performance characteristics.
    3) Materials of construction.
c. Guide rails and pump removal system components.
d. Alarm dialer.
e. Valves.
f. Hatches.
g. Manufactured steps and ladders.

3. Shop Drawings

a. Wet well and valve vault construction, including:
    1) Dimensioned drawings of pre-cast concrete components, including details of reinforcing steel.
    2) Calculations indicating compliance with standards and specifications, sealed by an engineer registered in the location of the project, where applicable.
b. Dimensioned piping, structure, and valve layouts.
c. Electrical control panels, including:
    1) Power supply line drawings.
    2) Manufacturer's literature on incorporated components.
    3) Control schematics.
    4) Control panel layout.
    5) Bill of materials.

B. Informational Submittals

1. Coordination Drawings

2. Manufacturer Test Reports

a. Prior to delivery:
    1) Manufacturer's factory test results on pumps.
    2) UL certification for control panel.
b. Test reports of compressive strength test on pre-cast concrete components.

3. Schedule of Tests and Inspections

4. Field Test Reports

5. Manufacturers' Instructions

6. Manufacturers' Field Reports

7. Product Warranties

C. Project Record Documents

1. Product Data
2. Shop Drawings
3. Factory test reports
4. Field test reports
5. Manufacturer's operations and maintenance literature
6. Record Drawings

1.5 QUALITY ASSURANCE

A. Qualifications

1. Pumps shall be manufactured and tested in accordance with the applicable requirements of the Hydraulic Institute and ASTM/ANSI standards.
2. All pump and control equipment shall be an integral package supplied by a single pump manufacturer/representative to provide undivided responsibility.
3. Pump manufacturer shall have a local certified repair company capable of providing on-site emergency service within 24-hours of notice.
4. Pre-Cast Concrete Structures
    a. Testing Agency
        1) Not less than three years experience in performing concrete tests of type specified in this section.
        2) Capable of performing testing in accordance with ASTM E329.
    b. Allowable Tolerances
        1) Length and width of precast units measured at face adjacent to mold shall be the following:
            a) Units 10 ft or under: ± 1/8".
            b) Units 10 to 20 ft: + 1/8", - 3/16".
            c) Units over 20 ft: + 1/8", - 1/4".
        2) Thickness of units shall be + 1/4", - 1/8".
        3) Units shall not be out of square more than 1/8" per 6 ft or 1/4" total.
5. Valves
    a. Valves, gear actuators, and motor operators shall comply with AWWA standards.
        1) Where no AWWA standard exists, comply with ASTM standards.

6. Control System

   a. Panel manufacturer shall be certified by Underwriters Laboratories (UL) as being a UL 508 and UL 698A listed systems panel manufacturer certified to install a serialized label for quality control and insurance liability considerations.
   b. Use only components readily available locally or through national mail-order electrical suppliers.

B. Regulatory Requirements

1. Motors and electrical controls shall meet all applicable requirements of the National Electrical Code and state and local regulations.

2. Comply with requirements of utility company providing wastewater service.

3. Comply with standards of authorities having jurisdiction for sewer-service piping, including materials, installation, and testing.

4. Comply with requirements of IDEM and EPA regarding wastewater facilities and service.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Storage and Protection

1. Environmentally sensitive electrical equipment such as motor starters, controls, transmitters, shall be protected against injury or corrosion due to environmental conditions or physical damage by storing under roof in a structure properly heated in cool weather and ventilated in hot weather. Control humidity in the storage at no more than 50 percent relative.

2. Contractor shall not store submersible pump units in the wet well.

3. All openings shall be capped with dustproof closures and all edges sealed or taped to provide a dust-tight closure.

4. Pre-Cast Concrete Structures

   a. Protect precast concrete units from dirt and damage during transportation and handling.
   b. Do not place units in positions which will cause overstress, warp or twist.
   c. Store units off the ground.
   d. Place stored units so that identification marks are discernable.

1.7 PROJECT CONDITIONS

A. Climatic Conditions: All components exposed to weather must be constructed of material that is resistant to corrosion and will not require surface protection throughout its expected life. In general, these materials are stainless steel, aluminum, Krydon, fiberglass reinforced polyester (FRP), and ultraviolet stabilized PVC.

B. Hazardous Locations: Pumps, electrical systems, and controls in the wet well shall meet NEC Class 1, Division 1, Group C & D requirements. Electrical systems and controls in the pump control panels shall meet NEC Class 1, Division 2, Group C & D requirements. Rail packages shall be of the non-sparking configuration.

C. Interruption of Existing Sewer Service: Do not interrupt sewer service from facilities occupied by Owner or others or sewer flow through the sewer system unless permitted under the following conditions and then only after arranging to provide temporary sewer service according to requirements indicated:

1. Notify Engineer and Owner no fewer than two (2) days in advance of proposed interruption of service.

2. Do not proceed with interruption of sewer service without Owner's written permission.

3. Comply with requirements of utility owner in providing temporary sewer service.

1.8 SCHEDULING

A. Ensure completion and acceptance of upstream and downstream facilities prior to testing and commissioning.

PART 2 - PRODUCTS

2.1 OPERATING CONDITIONS

A. Submersible Pump System

1. Walker LS: 400 GPM at 53’ TDH

2. Petty LS: 400 GPM at 75’ TDH

2.2 ACCEPTABLE PUMPING SYSTEMS

A. Myers – 4VH/4VHX (Walker LS) and 4VC/4VCX (Petty LS)

2.3 PUMP REMOVAL SYSTEM

A. The guide rail system for each lift station is new and will remain in place.

B. Base and Discharge Elbow

1. Each lift-out system shall consist of a cast or ductile iron discharge base, cast or ductile iron pump carrier and sealing plate, steel pump guide plate, and cast iron elbow. All exposed nuts, bolts, and fasteners shall be 300 series stainless steel.

2. Discharge elbow shall be of the size indicated and integral to the base assembly.

3. A sealing plate shall be threaded or bolted to the pump. A simple downward sliding motion of the pump and guide plate on the guide rails shall cause the unit to be automatically connected and sealed to the base.

C. Seal

1. The open face of the sealing plate shall have a dove-tailed groove machined into the face to hold an “O”-ring seal or bellows seal.

D. Lifting Chain

1. An adequate length of stainless steel lifting chain shall be supplied for removing pump.

2. The chain shall be connected to the pump or discharge flange as recommended by the pump manufacturer and also connected in an easily accessible location near the access hatch above the pumps in a manner to allow easy accessibility to the chain.

3. The chain shall provide at least 4:1 safety factor in strength.

2.4 LEVEL CONTROL SENSORS

A. Float Switches

1. Control of pump on, off, lag and alarm levels shall be by float switches.

2. Switches shall consist of a mercury tube switch sealed in a corrosion-resistant polypropylene housing with a minimum of 18 gauge, 2 wire, SJOW/A jacketed cable.

3. Float switches shall be suspended from the bracket so that adjustment or replacement may be done without the use of any tools.

B. Cable shall be of sufficient length to reach the control panel with no splices.

C. Level controls shall be UL/CSA listed.

2.5 PUMP CONTROL PANEL

A. Exterior pump control panels shall be NEMA 4X. Control panels shall be sized for the application. Separate control panel shall be furnished with each pumping system.

B. Stainless steel control panels shall be type 304 stainless steel, with a minimum thickness of 14 gauge.

C. The enclosure shall be of one piece construction with smooth, rounded corners and shall be constructed to have a smooth exterior and interior. The enclosure shall be fitted with a closed cell neoprene gasketed cover. The enclosure shall be provided with back panel mounting provisions. Exterior panels shall be provided with weather hoods.

D. The cover shall be hinged with a heavy duty corrosion resistant stainless steel piano hinge. The cover shall be lockable by means of two (2) high quality combination stainless steel latches and padlock hasps.

E. All control switches, lights, and meters on exterior-mounted panels, except those specifically indicated as being external, shall be mounted within the enclosure on a hinged aluminum panel. Control switches, lights, and meters on interior-mounted panels shall be placed on the front door unless otherwise indicated.

F. The back panel shall be a minimum of .080" aluminum and held in place by four (4) #10 screws, which will mate to four (4) threaded standoffs, which are molded into the enclosure.

G. A thermostat and heater shall be provided in each exterior-mounted control panel to prevent condensation and freezing.

H. A surge suppressor shall be provided in the control panel to protect all connected electrical equipment.

I. Panel shall include override relay, terminal blocks, two (2) ground lugs, and all necessary wiring and brackets.

J. All internal wiring shall be neat and color coded. Each wire shall be a different color or stripe (except for ground), and all incoming wires shall terminate into a box clamp type terminal block (except incoming power).

K. Circuit breakers shall be provided for each pump and for the control circuit.

L. A control transformer with primary fusing shall be provided for the control circuits where 120V power supply is not available.

M. For all control panels provided 3-phase power, socket-type power phase monitor shall shut down the control circuit and protect the 3-phase equipment upon loss of phase, phase imbalance, or phase reversal.

N. A weatherproof flashing alarm light shall be mounted on the outside of exterior control panels. Alarm light shall have a red bulb within a glass or acrylic cover surrounded by a removable cast aluminum protective cage. Alarm lights for interior control panels shall be located as indicated on the Drawings.

O. A weatherproof audible alarm horn shall be mounted on the outside of exterior control panels. Alarm horns for interior control panels shall be located as indicated on the Drawings. Horn shall be rated at 103 dB minimum.

P. A 20A weatherproof 120V GFI convenience outlet shall be located on the outside of the control panel.

Q. A schematic diagram (showing wire color) shall be permanently fastened to the inside of the enclosure.

R. The control panel shall be U.L. listed as an assembly and shall bear the UL label certifying that the system meets all U.L. requirements, including but not limited to UL 508 and UL 698A.

S. A mounting package shall be furnished to mount the control panel. All necessary hardware to mount the pedestal and control panel shall be stainless steel.

T. Controllers mounted on top of the wet well shall be mounted in accordance with NFPA 820 (Standard for Fire Protection in Wastewater Treatment and Collection Facilities).

U. Explosion-proof conduit sealing fittings or Intrinsically Safe Relays (ISRs) shall be used at all locations necessary to meet IEC and local requirements. Conduit seal fittings shall be ductile iron. ISRs shall be UL and FM approved and designed to interface devices in hazardous locations with equipment in non-

hazardous locations. The ISR shall operate from 120VAC and accept a minimum of two (2) inputs from a hazardous area.

2.6 PUMP CONTROLS

A. The pump controls shall be mounted on an internal panel face and be capable of controlling the duplex, three-phase pumping system.

B. Pump Controls

1. HOA Switches - Each pump shall be controlled by a hand-off-auto switch (momentary in the hand position).

2. Digital Pump Controller

a. Standard off-the-shelf 100% digital microprocessor (programmable logic controllers with custom software shall not be acceptable).
b. Digital readout and a keypad for entering operational settings.
c. Capable of accepting a pressure input of 0 to 35 feet, a current input of 4 to 20mA, or a voltage input of 0 to 10 volt (field selectable) that will function with any type of level transmitter.
d. Control adjustments shall be accomplished by direct digital inputs (potentiometers or other analog adjustments shall not be acceptable).
e. Allows for programming changes and complete level simulation from the front of the control plate without codes or special keypad sequences.
f. LED indicators shall be lighted and identify the function to be changed as the operator steps through the programming mode.
g. One 4 to 20 mA analog output.
h. Digital outputs from the controller shall be normally open relay contacts rated for 120 vac.
i. One RS485 serial port capable of operating with standard Modbus protocols.
j. Controller shall be manufactured by:
1) EG Controls, Jacksonville, Florida, represented by EG Controls, Inc. Factory Representative, Straeffer Pump & Supply, Inc. Evansville, Indiana
2) pre-approved equal.

C. Pump Control Sequence

1. Lead pump shall be started in Auto mode by the “On” level sensor.

2. Lag pump shall be started in the “Auto” mode by the “Lag” level sensor.

3. Alarm light shall be turned on by “Alarm” level sensor.

4. All pumps shall be turned off by the "Off" level sensor. Pumps may continue to be operated in "Hand" position with the level below the "Off" level sensor.

D. Control Lights and Switches

1. Control lights on the inside panel shall be provided for the following conditions:

   a. Pump run (green) for each pump.
   b. Moisture in pump (amber) for each pump.
   c. Power on (red) for control panel.

2. Switches or buttons will be provided on the inside panel for:

   a. alarm test (pushbutton).
   b. alarm reset (pushbutton).
   c. test lights (pushbutton).

3. No control lights shall be provided on the panel exterior.

E. Alarm Dialer

1. Panel mounted eight-channel dialer

2. Alarm Conditions.

   a. Low Level
   b. High Level
   c. Pump 1 Seal Fail
   d. Pump 1 Overload Trip & Over Temperature
   e. Pump 2 Seal Fail
   f. Pump 2 Overload Trip & Over temperature
   g. Power Failure.

3. Shall be Mission Commnications with a single dedicated 115V receptacle for power supply.

4. Provide local telephone service to dialer on Owner's account. Coordinate account and phone number programming with Owner.

F. Include a non-resetable hourmeter for each pump on the inside panel to register the elapsed operating time.

G. A solid state alternator relay shall be provided to automatically alternate pumps between lead and lag operation after each run.

H. Provide motor winding heat sensor circuit from each pump equipped with heat sensor. Circuit shall disconnect the starter upon high temperature signal and automatically reset when condition is corrected.

I. Provide seal failure alarm circuit from each pump equipped with seal failure sensor. Seal failure alarm shall energize panel alarm light but not disconnect the starter.

J. Time-Delay Relays: 5 HP and more

1. Relays shall be of the plug-in socket design.

2. Operate on 24 or 120VAC, as applicable for the controls design, and shall have DPDT contacts rated at 10A minimum.

3. Have a red LED for output contact status.

4. Be on-delay or off-delay as required.

5. Delay the start of the lag pump upon restoration of power after outage.

K. Nameplates and Identification

1. Provide screw-in type, engraved nameplates or laser-screened laminated mylar identification labels for all controls, disconnects, indicators, and lights on outer or inner panel doors.

2. Provide laser-screened laminated mylar identification labels for major components inside panel such as circuit breakers, motor starters, and transformers

3. Provide permanent printed labels or legible permanent marker identification for relays, fuses, phase monitors, surge arrestors, and any other minor equipment within panel.

4. All control wiring shall be numbered on each termination.

L. Surge Protection

1. Provide Category C-1 surge suppressor where the largest downstream motor is 10 horsepower or less, Category C-2 for motors to 25 HP, and C-3 for motors are larger than 25 HP.

2. Surge suppressor shall be designed for use at service entrance.

2.7 VARIABLE FREQUENCY DRIVES

A. Description: NEMA ICS 2, IGBT, PWM, VFD; listed and labeled as a complete unit and arranged to provide variable speed of a NEMA MG 1, Design B, 3-

phase, standard-efficiency induction motor by adjusting output voltage and frequency.

B. Design and Rating: Match load type such as fans, blowers, and pumps; and type of connection used between motor and load such as direct or through a power-transmission connection. **VFDs should be normal duty rated at service factor amps of the connected motor. VFDs being used for phase conversion shall be sized 2 to 2.5 times larger.**

C. Output Rating: 3-phase; 6 to 60 Hz, with voltage proportional to frequency throughout voltage range.

D. Unit Operating Requirements:

1. Input ac voltage tolerance of ~~380 to 500~~ **200 to 240** V, **1 phase** plus or minus 10 percent.

2. Input frequency tolerance of 50/60 Hz, plus or minus 6 percent.

3. Capable of driving full load, under the following conditions, without derating:

   a. Ambient Temperature: 0 to 40 deg C.
   b. Humidity: Less than 90 percent (non-condensing).
   c. Altitude: 3300 feet (1000 m).

4. Minimum Efficiency: 96 percent at 60 Hz, full load.

5. Minimum Displacement Primary-Side Power Factor: 96 percent.

6. Overload Capability: 1.1 times the base load current for 60 seconds; 2.0 times the base load current for 3 seconds.

7. Starting Torque: 100 percent of rated torque or as indicated.

8. Speed Regulation: Plus or minus 1 percent.

9. Isolated control interface to allow controller to follow control signal over an 11:1 speed range.

E. Internal Adjustability Capabilities:

1. Minimum Speed: 5 to 25 percent of maximum rpm.

2. Maximum Speed: 80 to 100 percent of maximum rpm.

3. Acceleration: 2 to a minimum of 22 seconds.

4. Deceleration: 2 to a minimum of 22 seconds.

5. Current Limit: 50 to a minimum of 110 percent of maximum rating.

F. Self-Protection and Reliability Features:

1. Input transient protection by means of surge suppressors.

2. Snubber networks to protect against malfunction due to system voltage transients.

3. Under- and overvoltage trips; inverter overtemperature, overload, and overcurrent trips.

4. Motor Overload Relay: Adjustable and capable of NEMA 250, Class 20 performance.

5. Notch filter to prevent operation of the controller-motor-load combination at a natural frequency of the combination.

6. Instantaneous line-to-line and line-to-ground overcurrent trips.

7. Loss-of-phase protection.

8. Reverse-phase protection.

9. Short-circuit protection.

10. Motor overtemperature fault.

G. Automatic Reset and Restart: To attempt three restarts after controller fault or on return of power after an interruption and before shutting down for manual reset or fault correction. Bidirectional autospeed search shall be capable of starting into rotating loads spinning in either direction and returning motor to set speed in proper direction, without damage to controller, motor, or load.

H. Power-Interruption Protection: To prevent motor from re-energizing after a power interruption until motor has stopped.

I. Torque Boost: Automatically vary starting and continuous torque to at least 1.5 times the minimum torque to insure high-starting torque and increased torque at slow speeds.

J. Motor Temperature Compensation at Slow Speeds: Adjustable current fall-back based on output frequency for temperature protection of self-cooled fan-ventilated motors at slow speeds.

K. Status Lights: Door-mounted LED indicators shall indicate the following conditions:

1. Power on.

2. Run.

3. Overvoltage.

4. Line fault.

5. Overcurrent.

6. External fault.

L. Panel-Mounted Operator Station: Start-stop and auto-manual selector switches with manual speed control potentiometer and elapsed time meter.

M. Indicating Devices: Meters or digital readout devices and selector switch, mounted flush in controller door and connected to indicate the following controller parameters:

1. Output frequency (Hz).

2. Motor speed (rpm).

3. Motor status (running, stop, fault).

4. Motor current (amperes).

5. Motor torque (percent).

6. Fault or alarming status (code).

7. PID feedback signal (percent).

8. DC-link voltage (VDC).

9. Set-point frequency (Hz).

10. Motor output voltage (V).

N. Control Signal Interface: Provide VFD with the following:

1. Electric Input Signal Interface: A minimum of 2 analog inputs (0 to 10 V or 0/4-20 mA) and 6 programmable digital inputs.

2. Output Signal Interface:

a. A minimum of 1 analog output signal (0/4-20 mA), which can be programmed to any of the following:
1) Output frequency (Hz).
2) Output current (load).
3) DC-link voltage (VDC).
4) Motor torque (percent).
5) Motor speed (rpm).
6) Set-point frequency (Hz).

3. Remote Indication Interface: A minimum of 2 dry circuit relay outputs (120-V ac, 1 A) for remote indication of the following:
    a. Motor running.
    b. Set-point speed reached.
    c. Fault and warning indication (overtemperature or overcurrent).
    d. PID high or low speed limits reached.

O. Communications: Provide an RS485 interface allowing VFD to be used with an external system within a multidrop LAN configuration. Interface shall allow all parameter settings of VFD to be programmed via PLC control. Provide capability for VFD to retain these settings within the nonvolatile memory. VFD shall have an ethernet connection for connection to a PLC or other network connections.

~~P. Manual Bypass: Arrange magnetic contactor to safely transfer motor between controller output and bypass controller circuit when motor is at zero speed. Controller-off-bypass selector switch sets mode, and indicator lights give indication of mode selected. Unit shall be capable of stable operation (starting, stopping, and running), with motor completely disconnected from controller (no load).~~**No bypass.**

Q. Isolating Switch: Non-load-break switch arranged to isolate VFD and permit safe troubleshooting and testing, both energized and de-energized, while motor is operating in bypass mode.

~~R. Bypass Controller: NEMA ICS 2, full-voltage, nonreversing enclosed controller with across-the-line starting capability in manual-bypass mode. Provide motor overload protection under both modes of operation with control logic that allows common start-stop capability in either mode.~~**No bypass.**

S. Integral Disconnecting Means: NEMA AB 1, instantaneous-trip circuit breaker with lockable handle.

T. VFD shall either be an ultra-low harmonics model or shall be supplied with corresponding 5% line, and 3% load reactors.

2.8 PRECAST CONCRETE VALVE VAULT

A. Description and Conditions: All bases, barrels, and tops for valve pits shall be precast reinforced concrete capable of withstanding external pressures including live surface loads, soil pressures and groundwater elevations to the finished grade in combination with internal pressures due to variable liquid elevations from empty to the top of the structure.

B. Material

1. All precast concrete structures shall be watertight and of durable materials not subject to decay or excessive corrosion.

2. Minimum compressive strength for all concrete shall be 4,000 psi at 28 days.

3. Reinforcing steel shall meet ASTM A615 with a yield strength of 60,000 psi.

4. Design of concrete structures shall meet specification ACI 350, AASHTO load factor design method including an HS20 loading, ASTM C890, ASTM C857, and ASTM C478, as applicable.

5. Manufacturing of precast reinforced sections shall conform to ASTM C478. Sections at depths greater than twelve (12) feet shall be reinforced with two cages of reinforcement as is required for Class III reinforced concrete sewer pipe of same diameter per ASTM C76.

6. Joints shall have tongue and groove O-ring seals, butyl joint sealer, and exterior joint collar meeting requirements of WM-9 and ASTM C443.

7. Handling or lifting lugs shall be provided for ease of unloading and placement.

8. Pipe connections through all precast concrete walls for all but ductile iron pipe shall be flexible connectors meeting ASTM C923.

9. Pipe connections through all precast concrete walls for ductile iron pipe shall be flexible connectors meeting ASTM C923 or modular seals designed for precast concrete structure pipe penetrations, similar to Link-Seal Model S-316.

10. External joint collar shall be Mac Wrap Exterior Joint and Sealer as manufactured by Mar-Mac Manufacturing Company or approved equal.

11. Manhole steps in valve vault shall be a polypropylene plastic encapsulating a ½" grade 60 steel reinforcing bar meeting ASTM C478, ASTM D4101 for polypropylene plastic, and ASTM A615 for reinforcing steel cast into vault sections.

2.9 SITE PIPING AND FITTINGS

A. Piping

1. Pipe shall be ductile iron conforming to AWWA C151.

2. Pressure class shall be 350 psi pressure class in conformance with AWWA C150:

B. Joints

1. Exposed Service

a. Threaded flanges, gaskets, and flange fittings in conformance with AWWA C115.
b. ASME B16.5, Class 150, DI or ASME 16.1, Class 125, CI for other flanges, gaskets, and flange fittings.
c. Flange Backup Rings
1) Flange backup rings shall be of the type and pressure rating as the pipe.
2) Ductile iron backup rings shall be of the convolutant type, fabricated from ductile iron per ASTM A536, grade range 60/40/18 to 65/45/12. Ductile iron flange backup ring bolting dimension shall conform to ASME B16.5 Class 150.
3) Backup rings shall be finished and cast with flash removed from all edges and bolt holes to the specified dimensions. Finish shall be epoxy coated with bitumastic 300M high build coal tar epoxy in accordance manufacturer's recommendations or as noted on the plans.

2. Buried Service

a. Mechanical joints in accordance with AWWA C110 and AWWA C111.
b. Push-on type joint conforming to AWWA C111.
c. Gaskets meeting AWWA C111.
d. Manufactured restrained joints under conditions indicated by manufacturer.
e. Field-adaptable restraint shall have a working pressure equal to at least the pipe's working pressure rating and shall be Megalug 1100 as manufactured by EBAA Iron, Uni-Flange Series 1400 (16" or less) by Ford Meter Box Company, or equal.

C. Coatings

1. Interior seal-coated cement mortar lining shall meet the requirements of AWWA C104.

2. Exterior coating shall meet the requirements of AWWA C151.

a. Field Coats
1) Prime with TNEMEC Series 135, 2.0 DFT
b. Topcoats
1) Two coats of TNEMEC Series 69, 3.0 DFT per coat.

3. Interior and exterior coatings shall be provided for all pipe and fittings

4. Exterior coatings shall be provided for all adapters.

D. Encasement

1. Buried Service: Polyethylene encasement shall conform to AWWA C105.

2. Exposed Service: None.

E. Fittings

1. DI meeting the requirements of AWWA C110, standard pattern or AWWA C153, compact pattern.

2. Specials

a. Special fittings not included in applicable AWWA specifications shall be reviewed on a case-by-case basis.
b. Manufacturer shall legibly mark specials in accordance with the laying schedule and marking diagram.

F. DI expansion couplings shall be provided in all underground piping extending between structures and at the transition to the force main.

G. Piping shall be supported independently of the pump flanges and shall not bear on the concrete structures at penetrations.

H. Quick connect coupling shall be male stainless steel cam and groove-type connector meeting MIL-C-27487 dimensions. Provide stainless steel female dust cap for connector.

2.10 PLUG VALVES

A. Plug valves shall be resilient-seated eccentric.

1. Standard: MSS SP-108.

2. Connections, as applicable:

a. Mechanical-joints: conform to AWWA C111.
b. Flanges: conform to ANSI B16.1, Class 125 or ANSI B16.5, Class 150.

3. Body: Cast iron or ductile iron.

4. Pressure Rating

a. 3” – 12” Valves: 175-psig minimum.
b. 14” – 72” Valves: 150 psig minimum.

5. Seat Material: As recommended by manufacturer for sewage service.

B. Valve Boxes: Comply with AWWA M44 for cast-iron valve boxes. Include top section, adjustable extension of length required for depth of burial of valve, plug

with lettering "SEWAGE" and bottom section with base that fits over valve and with a barrel approximately 5 inches in diameter.

1. Operating Wrenches: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and socket matching valve operating nut.

C. Operators, unless indicated otherwise:

1. Buried Service: 2” AWWA Operating Nut.

2. Exposed Service to 6’-6” above finished floor: Lever.

3. Exposed Service above 6’-6” above finished floor: As directed by Engineer.

D. Stems: Non-rising unless indicated otherwise.

2.11 CHECK VALVES

A. General

1. Check valves shall be swing checks of the rubber flapper type conforming to AWWA C508. Check valves shall have an external adjustable weighted lever and a flexing, sprung, internally steel reinforced flapper of Buna-N with an “O” ring seating edge and be designed for 175 PSI working pressure.

B. Cushioned Swing Check Valves

1. Application: Cushioned swing check valves shall be used in applications greater than 120’ TDH or where indicated on the Drawings.

2. Cushioned swing check valves shall have a air cushioning cylinder assembly externally attached to the side of the valve body to eliminate valve slamming.

2.12 POWER SUPPLY AND DISTRIBUTION

A. Provide underground or overhead power supply to power meter according to directions of power company.

B. Provide mounting panels for power supply and control panels as shown on Drawings.

C. Provide disconnects, grounds, conduit, fuse and breaker boxes, wiring, and other electrical power distribution components as provided in the Contract Documents and as required by electrical codes.

2.13 ALARM DIALER

A. Panel mounted eight-channel dialer, Mission Communications with a single dedicated 115V receptacle for power supply.

B. Dialer to monitor: Low Level; High Level; Pump 1 Seal Fail, Overload Trip & Over Temperature; Pump 2 Seal Fail, Overload Trip & Over temperature; Power Failure.

C. Provide in pump control panel or separate NEMA 4X SS enclosure mounted adjacent to pump control panel.

D. Provide local telephone service to dialer on Owner’s account. Coordinate with Owner.

2.14 NAMEPLATES

A. Each piece of mechanical equipment shall be provided with a substantial nameplate, securely fastened in place and clearly inscribed with the manufacturer's name, year of manufacture, serial number, and principal rating data.

B. A second identical nameplate shall be provided for all submersible pumps and affixed to the interior of the control panel.

PART 3 - EXECUTION

3.1 VALVE VAULT INSTALLATION

A. Granular material shall be placed and graded to be flat and level in the bottom of the excavation prior to tank installation. Material type and depth shall be according to manufacturer’s instructions, but depth shall not be less than 6”.

B. All joints shall be sealed watertight with butyl rubber sealant according to pre-cast concrete manufacturer’s direction.

C. Install exterior collar on all valve vault joints.

D. Coat exterior surface below grade with a two part bituminous epoxy or approved equivalent. Coat interior surface where indicated on the Drawings.

1. Apply after proper concrete curing time.

2. Surface Preparation: All surfaces must be clean and structurally sound, free of dirt, grease, oil, paint, etc. Remove contamination with abrasive blasting, water blasting or wire brush. Make sure all dust is removed after abrasives. Metal should be blasted to SSPC SP-6, 2 to 4 mils profile before coating. Concrete should be blasted or acid etched before coating. Remove all acid with water before coating.

3. Mixing: Mix well according to manufacturer's directions with low speed drill and mixing paddle. Stir until uniform, smooth material is seen. Mix minimum of three (3) minutes. Scrape sides and bottom frequently. Avoid entrapping air in mixture. For best results, when spraying, strain material through a 60 mesh screen prior to spraying.

4. Application: Apply by brush or spray. If sprayed, brush into imperfections. Do not exceed manufacturer's indicated pot life. If heated and sprayed, mix only what can be applied within 30 minutes. Spraying will be done only with specialized equipment. Both components must be heated to 100°F before spraying. Plural component guns may be used where indicated by manufactuer. Higher temperatures and larger masses shorten pot life.

5. Limitations: Do not use below 40°F. Store material under dry conditions. For best results before spraying, rolling, or applying by brush, condition material to 70°F or higher.

E. Test valve vault in accordance with ASTM C1244.

3.2 POWER SUPPLY

A. Coordinate with local power company to provide necessary power to the site.

B. Coordinate with Owner and power company to set up utility account and rate structure most favorable for Owner.

C. Coordinate with Owner and power company for location of power poles, guy wires, power lines, easements, and location of electric meter.

D. Install power poles, guys, weatherheads, meter bases, service entrances, grounds, and other power supply items required by power company for service.

E. Provide required power from electric meter to all electrical components and systems.

3.3 PUMP INSTALLATION

A. All pumps and pumping equipment shall be installed per the manufacturer's recommendations.

B. During pump installation, the open power cable ends are to be suspended above the maximum flood elevation or maximum expected water level. If not installed in this manner, Contractor may be required to replace the pump motors and cables with new units to ensure that water has not penetrated the cable and entered the motor housing.

C. Pumps will be tested after installation using clean water. Tests shall include:

1. Pumping draw-down test to confirm pump output meets or exceeds design.

2. Test controls for proper function.

3. Amp test to confirm power draw within equipment limits.

3.4 CONTROLS AND POWER DISTRIBUTION

A. Control wiring and pump power wiring shall be installed in separate conduits from the wetwell to the control panel. Seal conduits watertight on both ends.

B. Control panel shall be mounted at the location indicated on the Drawings.

3.5 VALVES

A. Locate and orient exposed valves to allow valve to be readily operated without operator binding. Operating levers or wheels on valves should be horizontal (operating stem vertical) with adequate space to fully open and fully close the valve. Check valve swing arms should be capable of freely operating without binding or touching other components.

B. Orient buried valves, valve box, actuator, and other components to allow valve to be readily operated without binding. Operating nuts should be vertical and centered in the valve box.

C. Valve boxes shall be carefully installed over each buried valve (except combination valves) and supported in a manner that will not allow surface loads to be transmitted to the valve or pipe. Care shall be taken to see that the bottom of the box is clear and free of debris, rocks, etc., which will interfere with the operation of the valve stem.

3.6 FIELD PAINTING

A. Field paint all new equipment; exposed piping, valves, and fittings; submerged and exposed structural steel; exposed electrical conduits; miscellaneous metal items including galvanized steel; and aluminum surfaces in direct contact with concrete.

B. Non submerged surfaces shall be cleaned in accordance with SSPC Spec. SP1, 2, 3, 5, 6, 7 or 10 as called for under each "Service Condition" set out hereinafter. Sandblasting shall be done with sharp white silica sand of 16/35 grade mesh or finer. When possible, surfaces shall be prepared and primed at the fabricator's shop. Surfaces to be shop primed may be prepared by pickling, SSPS SP8.

C. Do not field paint stainless steel, fiberglass, aluminum, grating, or items with special coatings.

D. Shop coats of paint or other protective coatings damaged in transit or during construction shall be touched up in the field with primer coat before start of finish coats.

E. Colors of paint where not specified shall be as selected by the Owner.

3.7 FIELD QUALITY CONTROL

A. Testing, General

1. Test new wet wells, controls, pumping, and piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

2. Inspect and test completed piping systems.

3. Schedule inspections and tests with Owner and Engineer with at least 48 hours' advance notice.

4. Submit separate report for each test.

5. Any visible leaks, evidence of leaks, or malfunctioning or improperly functioning equipment or controls shall result in a failed test.

6. Failures of inspections or tests indicate defects that must be repaired or replaced.

7. Replace failed work using new materials, and repeat testing until test results are within allowances specified.

B. Cleaning

1. Conduct standard cleaning prior to acceptance testing.

C. Pump and Controls Tests

1. Applicability

a. All new lift station pumps and controls shall be tested.
b. Test after:
1) Installation of all electrical and mechanical systems have been completely installed, with all connections in place.
2) Backfilling to design grade.
3) Completion and acceptance of force main(s) discharging from lift station.
4) Manufacturer's successful start-up of all mechanical, electrical, and controls systems.
a) Submit manufacturer's start-up records with request for testing.

2. Procedure

a. Provide the following pump test equipment and materials:
1) Clean water to conduct test
2) Amp/volt meter
3) Stop watch
4) Tape or level rod to measure float settings
5) Calibrated pressure gauge to measure operating head. The gauge shall be calibrated in feet of water from 0 to 100 feet (or next higher normal gauge range if pump shut-off head is higher) in one foot increments.
6) A connection for the pressure gauge on the tee or cross in the valve vault. Equip the gauge stem connection with a gauge cock or miniature ball valve to close the connection after testing is complete. The connection shall be left in place and shall be suitable for use as an air bleed off.
b. Conduct the following tests or analyses in the presence of Engineer and Owner's representative:
1) Manually check all floats' on/off operations, alarm and run lights, and alarm horns.
2) Check the functioning and performance of control switches, alternators, and gauges.
3) Confirm proper functioning of the SCADA or remote monitoring system.
4) Determine pump capacity for each pump individually and all pumps operating simultaneously.
a) Determine inflow rate (if any).

b) Perform full-cycle pump-down test of each pump. Check amperage draw of each leg of each pump motor.
c) Perform full-cycle pump-down test of all pumps. Check voltage at motor power cable connections.
d) Determine each pump's capacity with force main full.
e) Plot performance of each pump on pump curves.

3. Determination of Pumps and Controls Acceptance: If all pumps and controls function as designed and intended, the pumps and controls shall have passed the test.

4. Determination of Pumps and Controls Failure: If any pump or control shall not function as designed and intended, the pumps and controls shall have failed the test.

5. Correction

   a. If the pumps and controls fail this test, locate defects and notify Engineer of findings. Repair or replace defects in a manner acceptable to Engineer.

END OF SECTION 11310

SECTION 26 56 00 - EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Division - 26 Basic Electrical Materials and Methods sections apply to work specified in this section.

1.2 SUMMARY

A. Extent of exterior lighting fixture work is indicated by drawings and schedules.

B. Types of exterior lighting fixtures in this section include the following:

1. LED, unless otherwise indicated.
2. Light Emitting Diode (LED)

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions on each type exterior building lighting fixture.

1.4 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of exterior building lighting fixtures of types and ratings required, whose products have been in satisfactory use in similar service for not less than 3 years.

B. Installer's Qualifications: Firm with at least 3 years of successful installation experience on projects with exterior lighting fixture work similar to that required for project.

C. Codes and Standards:

1. Electrical Code Compliance: Comply with applicable local code requirements of the authority having jurisdiction and NEC Articles 225, 250, 410, and 501 as applicable to installation and construction of exterior building lighting fixtures.
2. NEMA Compliance: Comply with applicable requirements of NEMA Stds. Pub/No. LE 2 pertaining to lighting equipment.
3. UL compliance: Comply with requirements of UL standards, including Stds. 486A and B, pertaining to exterior lighting fixtures. Provide exterior lighting fixtures and components which are UL-listed and labeled.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver exterior lighting fixtures in factory-fabricated containers or wrappings, which properly protect fixtures from construction debris and physical damage.

B. Store exterior lighting fixtures in original wrappings in a clean dry space. Protect from weather, dirt, fumes, water, construction debris and damage.

C. Handle exterior lighting fixtures carefully to prevent damage, breaking, and scoring. Do not install damaged fixtures or components; remove units from site and replace with new.

1.6 SEQUENCING AND SCHEDULING

A. Coordinate with other electrical work including wires/cables, electrical boxes and fittings, and

raceways, to properly interface installation of exterior lighting fixtures with other work.

B. Sequence exterior lighting installation with other work to reduce possibility of damage and soiling of fixtures during remainder of construction period.

1.7 MAINTENANCE

A. Maintenance Data: Submit maintenance data and parts list for each exterior lighting fixture and accessory; including "trouble-shooting" maintenance guide. Include that data, product data, and shop drawings in a maintenance manual; in accordance with requirements of division 1.

B. Extra Stock: Furnish stock or replacement lamps amounting to 10 percent (but not less than one lamp in each case) of each type and size lamp used in each type fixture. Deliver replacement stock as directed to Owner's storage space.

1.8 WARRANTY

A. For LED fixtures, lamps, drivers, and components, provide a complete warranty for parts and labor for a minimum of five years from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work are listed on the fixture schedule.

2.2 EXTERIOR LIGHTING FIXTURES

A. General: provide lighting fixtures, of sizes, types and ratings indicated; complete with, but not limited to, housings, poles, energy efficient ballasts, starters, lamps and wiring.

B. Wiring: Provide electrical wiring within fixtures which is suitable for connection to branch circuit wiring as follows:

1. NEC Type AF for 120-volts, minimum no. 18 AWG.; NEC Type SF-2 for 208-volts, minimum No. 18 AWG.

C. LED Drivers: Luminaires shall be equipped with an LED driver(s) that accepts the voltage as indicated on the “Luminaire (Lighting Fixture) Schedule”. Individual driver(s) shall be replaceable. Drivers shall comply with the following requirements:

1. Drivers shall be UL 8750 class 2 listed for their intended purpose.
2. Drivers shall have a minimum efficiency of 85%
3. Drivers shall reliably start at minimum ambient temperatures from -400C with to 400C with THD of <=20%.
4. Drivers shall deliver full-range from 0-10V control signal.

D. LED Light Source (Light engine): All Led light engines shall be set to achieve IES, Type III, Type IV or Type V distribution as shown on the “Luminaire (Lighting Fixture) Schedule”. Individual light engines shall be replaceable. LED Light sources shall comply the following conditions: requirements:

1. LED light engines shall have a minimum lifetime of 50,000+ hours at 400C and shall have a minimum efficacy of 80 lumens per watt.
2. All LEDs shall be installed with 0 lumens above 900 up from nadir (full cut-off) performance.

3. LED dies shall be tested in accordance with I.E.S.N.A. LM-80-08 standards.

E. Dimming Controls: Dimming controls shall be compatible with the lighting control system. (DIMMING NOT USED FOR THIS PROJECT).

2.3 PHOTOCELL CONTROLLERS

A. 2000 watt, 120 VAC rated, conduit pedestal mounted, used to control an individual circuit or a lighting contactor; Tork Model #2101 or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions under which lighting fixtures are to be installed, and substrate which will support lighting fixtures. Notify Contractor in writing of conditions detrimental to proper completion of the Work. Do not proceed with the Work until satisfactory conditions have been corrected in a manner acceptable to Installer.

3.2 INSTALLATION OF EXTERIOR LIGHTING FIXTURES

A. Install exterior lighting fixtures at locations and heights as indicated, in accordance with fixture manufacturer's written instructions, applicable requirements of NEC, NECA's "Standard of Installation", NEMA standards, and with recognized industry requirements.

B. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Stds 486A and B, and the National Electrical Code.

C. Fasten electrical lighting fixtures and brackets securely to structural supports, and ensure that installed fixtures are plumb and level.

D. Construct reinforced concrete bases flush with grade, with conduits, anchor bolts and ground wire. Provide six foot minimum ground rod located six foot distant from pole, 24" below finished grade to top of ground rod; provide #4 ground wire.

E. Install poles on bases and adjust to provide plumb installation.

3.3 GROUNDING

A. Provide equipment grounding connections for exterior lighting fixtures. Tighten connections to comply with tightening torques specified in UL Std. 486A to assure permanent and effective grounds. Provide ground rod and bonding conductor for pole mounted fixtures.

3.4 FIELD QUALITY CONTROL

A. At the Date of Substantial Completion, replace lamps in exterior lighting fixtures which are observed to be noticeably dimmed as judged by the Architect/Engineer.

3.5 ADJUSTING AND CLEANING

A. Aim adjustable lighting fixtures and lamps in night test of system.

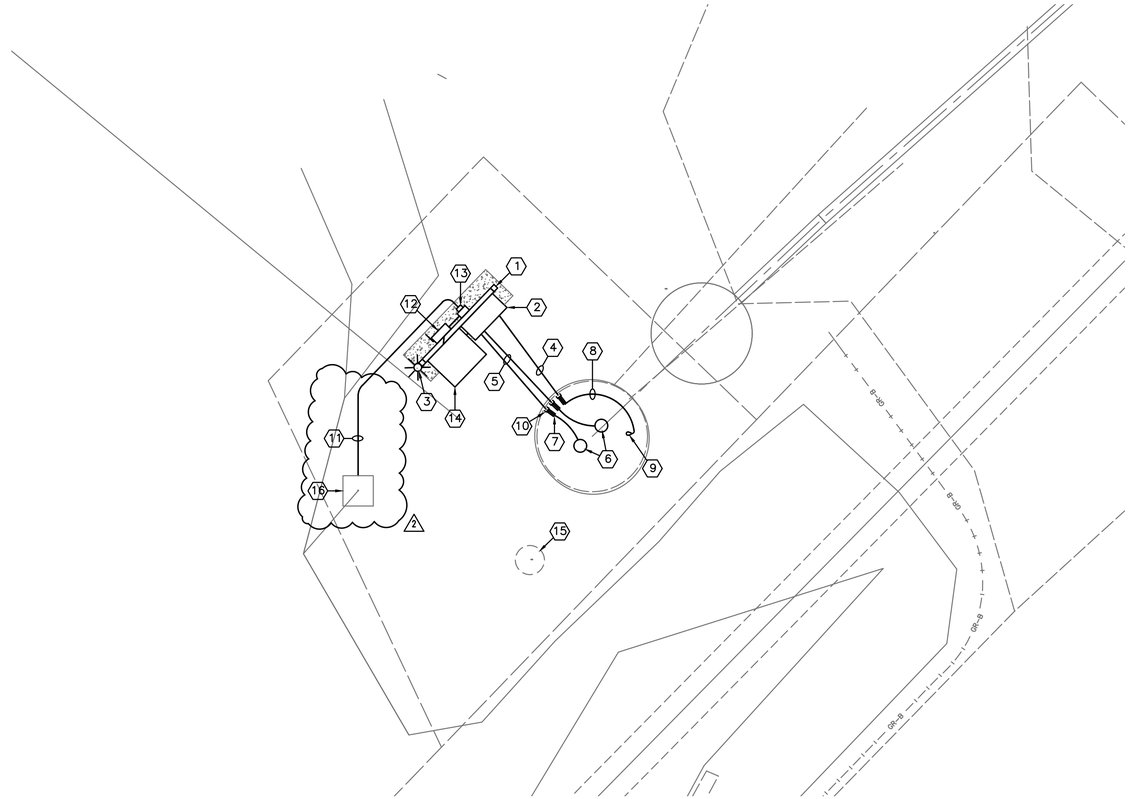
B. Clean lighting fixtures of dirt and debris upon completion of installation.

C. Protect installed fixtures from damage during construction period.

3.6 DEMONSTRATION

A. Upon completion of installation of exterior lighting fixtures, and associated electrical supply circuitry, apply electrical energy to circuitry to demonstrate compliance with requirements. Where possible correct any malfunctions at the site, then retest to demonstrate compliance; otherwise, remove and replace with new units, and proceed with retesting.

END OF SECTION



ELECTRICAL KEYED NOTES: ⬡

1. HEAVY DUTY EQUIPMENT RACK.
2. PUMP CONTROL PANEL.
3. STANCHION MOUNTED AREA LIGHT,
4. UNDERGROUND I&C WIRING AND CONDUIT.
5. UNDERGROUND POWER WIRING AND CONDUIT.
6. (2) SUBMERSIBLE PUMPS. SEE ONE-LINE DIAGRAM.
7. UTILIZE KELLEMS GRIPS FOR EACH CABLE SUSPENDED FROM BOX.
8. FLOAT SWITCH CABLES, FLOAT SWITCHES IN 1-1/2" C. PVC BELOW GRADE AND GALVANIZED RIGID STEEL ABOVE GRADE. CABLES SHALL BE CONTINUOUS TO VENTED BOX AND NOT SPLICED. PROVIDE ADEQUATE LENGTH FROM MANUFACTURER. FLOAT CABLES GO TO PUMP CONTROL PANEL.
9. NEW DIRECT ACTING, NON-MERCURY FLOAT SWITCHES ENCASED IN AN ELLIPSE-SHAPED MOLDED PLASTIC FLOAT, CONNECTED TO A FACTORY INSTALLED CABLE. THE FLOATS SHALL BE SUSPENDED BY THEIR CABLES BY A MEANS OF A WEIGHT KIT, AS INDICTED IN THE EQUIPMENT DATA.
10. PROVIDE LINK SEAL FOR EACH WET WELL PENETRATION.
11. UNDERGROUND SERVICE SECONDARY.
12. SERVICE ENTRANCE RATED DISCONNECT SWITCH.
13. UTILITY METER. FURNISHED BY UTILITY. PROVIDE 4' OF CLEAR SPACE IN FRONT OF METER.
14. MANUAL TRANSFER SWITCH.
15. EXISTING UTILITY METER TO BE REMOVED.
16. RECONNECT TO EXISTING PAD-MOUNTED TRANSFORMER. ⬡ 2

PETTY LIFT STATION ELECTRICAL SITE PLAN

SCALE: 1"=5'-0" WHEN PRINTED AT 24x36

N

0 5' 10'

SIMS-DURKIN ASSOCIATES
ENGINEERING COMPANY
5755 WEST 74TH STREET INDIANAPOLIS, IN 46278
PHONE: 317-209-4035
WEB: WWW.SIMS-DURKIN.COM
SDA PROJECT NUMBER: 2023133

egis GROUP
BLN BEAM·LONGEST·NEFF

REVISIONS AND ISSUES	DATE	BY
ADDENDUM #2	12/09/2024	WRK

WILLIAM R. KASSBAUM
REGISTERED
NO
PE10504708
STATE OF
INDIANA
PROFESSIONAL ENGINEER
CERTIFYING ELECTRICAL ONLY

CONSTRUCTION PLANS FOR:
LIFT STATIONS AND WWTP IMPROVEMENTS
MONTGOMERY, DAVIESS COUNTY, INDIANA S25, T3N, R6W

TOWN OF MONTGOMERY
370 MAIN STREET, MONTGOMERY, IN 47558

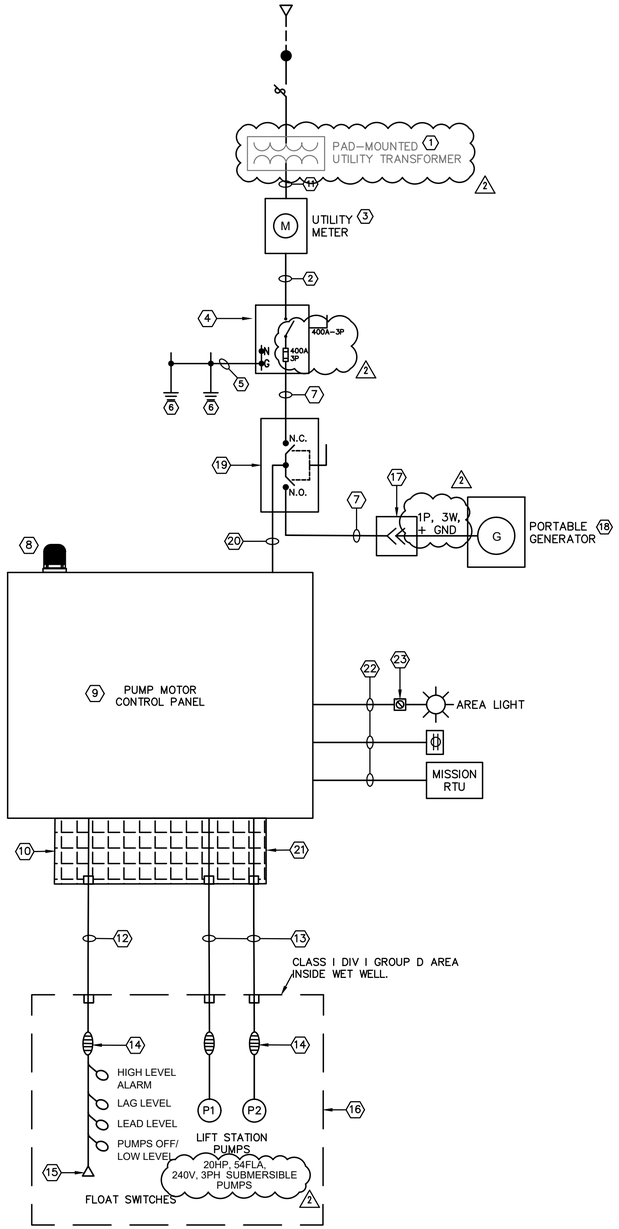
PETTY LIFT STATION ELECTRICAL SITE PLAN

PLAN DATE: NOVEMBER 13TH, 2024

DESIGN:	CHECK:	DRAWN:
WRK	WRK	CAG

PROJECT NO. **220060**

SHEET NO. **E600**



CONDUIT REQUIREMENT NOTES:

A. USE GALVANIZED RIGID STEEL FOR ALL EXTERIOR CONDUIT ABOVE GRADE, PVC CONDUIT UNDERGROUND.

B. USE MEYERS HUBS OR SEALING LOCKNUTS FOR ALL NON-CLASSIFIED CONDUIT INSTALLATION.

C. PROVIDE STAINLESS STEEL HARDWARE FOR ALL EQUIPMENT INSTALLED IN WET WELL; THIS INCLUDES BUT NOT LIMITED TO KELLEMS CABLE GRIPS, CABLE RACKS, MOUNTING BRACKETS. BOLTS AND NUTS.

D. WET WELL CLASSIFICATION IS CLASS 1 DIVISION 1 GROUP D; ALL WIRING METHODS SHALL COMPLY.

E. AREA WITHIN A 3' RADIUS FROM THE WET WELL HATCH AND VENT IS CLASS 1 DIVISION 2 GROUP D RATED.

ELECTRICAL KEYED NOTES:

1. EXISTING 120/240V, 1PH, 3W PAD-MOUNTED TRANSFORMER.
2. (2) PARALLEL RUNS OF 4-#3/0 CU, 2" C. EACH.
3. UTILITY METER MOUNTED TO EQUIPMENT RACK.
4. SERVICE ENTRANCE RATED FUSED DISCONNECT SWITCH, 100A, 480V, 3PH, WITH NEUTRAL BOND KIT AND WITH GROUND LUGS, WITH GND, NEMA 4 PAINTED STEEL, MINIMUM 14KAIC.
5. #6 BARE CU GROUND ELECTRODE CONDUCTOR, 3/4" C.
6. (2) 5/8" X 8' CU CLAD GROUND RODS. BURIED 12" BELOW GRADE, SPACED 10' APART.
7. (2) PARALLEL RUNS OF 4-#3/0 CU, 1-#3 CU GND, 2-1/2" C. EACH.
8. NEMA 4X ALARM BEACON.
9. LIFT STATION PUMPS MOTOR CONTROL PANEL. REFER TO CONTROL PANEL LAYOUT SHEET AND MOTOR CONTROL WIRING DIAGRAM SHEET. FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR.
10. VENTILATED SHEET METAL WIREWAY BELOW PANEL.
11. 4" PVC C. FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR, CONDUCTORS BY UTILITY COMPANY.
12. FLOAT SWITCH CABLES IN 2" C. PVC BELOW GRADE AND RIGID STEEL ABOVE GRADE. CABLES SHALL BE CONTINUOUS TO PUMP CONTROL PANEL AND NOT SPLICED. PROVIDE ADEQUATE LENGTH FROM MANUFACTURER.
13. 3-#2 CU, 1-#6 CU GND FOR PUMP WIRING. SEAL FAIL, OVERTEMP CABLES, AND PUMP WIRING INSTALLED IN COMMON 2"C; ONE 2"C. FOR EACH PUMP.
14. ALL CABLE SUPPORTS SHALL BE WITH KELLEMS GRIPS.
15. WEIGHT FOR CABLE.
16. WET WELL.
17. GENERATOR RECEPTACLE WITH PIN & SLEEVE STYLE CONNECTION, TO MATCH GENERATOR CORD SET.
18. MOBILE GENERATOR PROVIDED BY OWNER, MINIMUM 75KW.
19. 400A, 240V, 1PH, NF, 2P-DT MANUAL SELECTOR SWITCH WITH INSULATED NEUTRAL BLOCK AND EQUIPMENT GROUND BLOCK, NEMA 4 PAINTED STEEL ENCLOSURE, MINIMUM 14KAIC.
20. (2) PARALLEL RUNS OF 3-#3/0, 1-#3 EQUIP. GND., 2" C. EACH.
21. CABLE GLAND FITTING, CLASS I, DIV II RATED.
22. 2-#12 CU, 1-#12 CU GND, 3/4" C. PROVIDE 1P-20A BREAKER FOR ACCESSORY LOADS.
23. NEMA 4X ON-OFF SELECTOR SWITCH FOR AREA LIGHT.

PETTY LIFT STATION POWER ONE-LINE DIAGRAM

SCALE: NONE

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5755 WEST 74TH STREET INDIANAPOLIS, IN 46278
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SDA PROJECT NUMBER: 2023133

egis GROUP
BLN BEAM-LONGEST-NEFF

REVISIONS AND ISSUES	DATE	BY
ADDENDUM #2	12/09/2024	WRK

WILLIAM R. KASSBAUM
REGISTERED NO PE10504708 STATE OF INDIANA
PROFESSIONAL ENGINEER
CERTIFYING ELECTRICAL ONLY

CONSTRUCTION PLANS FOR:
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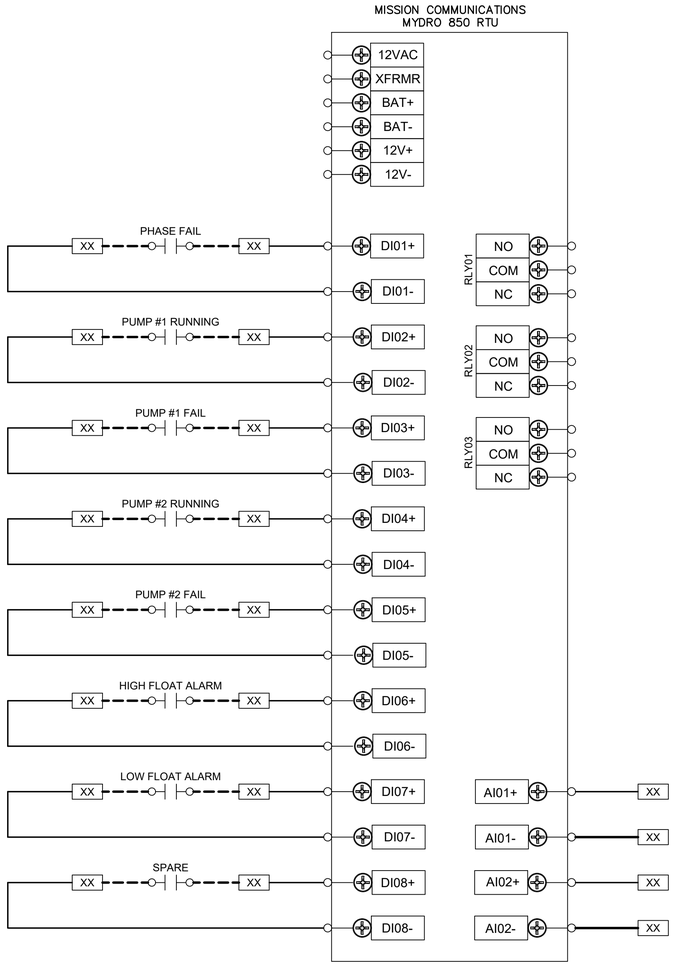
MONTGOMERY, DAVIESS COUNTY, INDIANA S25, T3N, R6W
TOWN OF MONTGOMERY
370 MAIN STREET, MONTGOMERY, IN 47558
PETTY LIFT STATION POWER ONE-LINE DIAGRAM

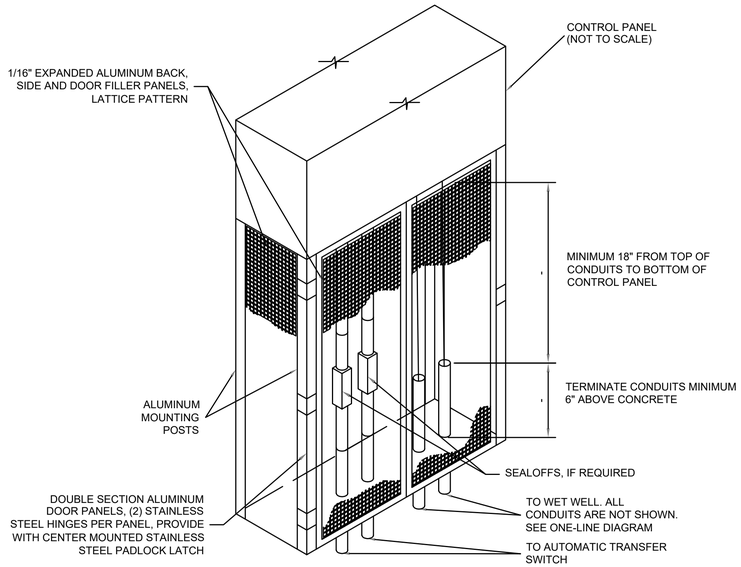
PLAN DATE: NOVEMBER 13TH, 2024

DESIGN:	CHECK:	DRAWN:
WRK	WRK	CAG

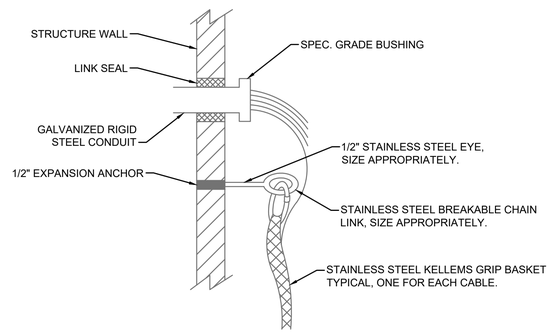
PROJECT NO. 220060

SHEET NO. E601





CONTROL PANEL AIR-BREAK
NO SCALE (CONCEPTUAL)



CABLE SUPPORT DETAIL
NO SCALE (CONCEPTUAL)

PETTY LIFT STATION ELECTRICAL DETAILS
SCALE: NONE

SIMS-DURKIN ASSOCIATES ENGINEERING COMPANY
5755 WEST 74TH STREET INDIANAPOLIS, IN 46278
PHONE: 317-209-4035
WEB: WWW.SIMS-DURKIN.COM
SDA PROJECT NUMBER: 2023133

Egis BLN BEAM-LONGEST-NEFF GROUP

REVISIONS AND ISSUES	DATE	BY
ADDENDUM #2	12/09/2024	WRK

WILLIAM R. KASSBAUM REGISTERED NO PE10504708 STATE OF INDIANA PROFESSIONAL ENGINEER
CERTIFYING ELECTRICAL ONLY

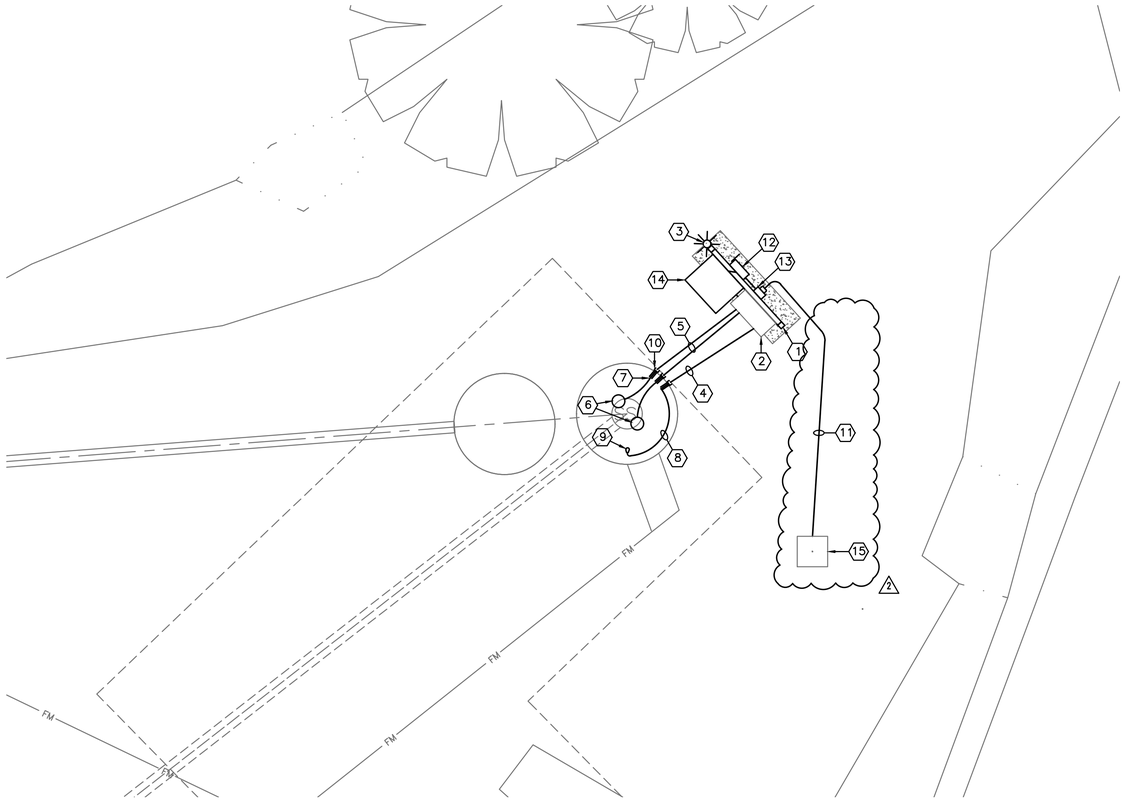
CONSTRUCTION PLANS FOR:
LIFT STATIONS AND WWTP IMPROVEMENTS
MONTGOMERY, DAVIESS COUNTY, INDIANA S25, T3N, R6W
TOWN OF MONTGOMERY
370 MAIN STREET, MONTGOMERY, IN 47558
PETTY LIFT STATION ELECTRICAL DETAILS

PLAN DATE: NOVEMBER 13TH, 2024

DESIGN:	CHECK:	DRAWN:
WRK	WRK	CAG

PROJECT NO. **220060**

SHEET NO. **E602**



ELECTRICAL KEYED NOTES: ⬡

1. HEAVY DUTY EQUIPMENT RACK.
2. EXISTING PUMP CONTROL PANEL TO BE RELOCATED TO NEW EQUIPMENT RACK.
3. STANCHION MOUNTED AREA LIGHT,
4. UNDERGROUND I&C WIRING AND CONDUIT.
5. UNDERGROUND POWER WIRING AND CONDUIT.
6. (2) SUBMERSIBLE PUMPS. SEE ONE–LINE DIAGRAM.
7. UTILIZE KELLEMS GRIPS FOR EACH CABLE SUSPENDED FROM BOX.
8. FLOAT SWITCH CABLES, FLOAT SWITCHES IN 1–1/2" C. PVC BELOW GRADE AND GALVANIZED RIGID STEEL ABOVE GRADE. CABLES SHALL BE CONTINUOUS TO VENTED BOX AND NOT SPLICED. PROVIDE ADEQUATE LENGTH FROM MANUFACTURER. FLOAT CABLES GO TO PUMP CONTROL PANEL.
9. NEW DIRECT ACTING, NON–MERCURY FLOAT SWITCHES ENCASED IN AN ELLIPSE–SHAPED MOLDED PLASTIC FLOAT, CONNECTED TO A FACTORY INSTALLED CABLE. THE FLOATS SHALL BE SUSPENDED BY THEIR CABLES BY A MEANS OF A WEIGHT KIT, AS INDICTED IN THE EQUIPMENT DATA.
10. PROVIDE LINK SEAL FOR EACH WET WELL PENETRATION.
11. UNDERGROUND SERVICE SECONDARY.
12. SERVICE ENTRANCE RATED DISCONNECT SWITCH.
13. UTILITY METER. FURNISHED BY UTILITY. PROVIDE 4' OF CLEAR SPACE IN FRONT OF METER.
14. MANUAL TRANSFER SWITCH.
15. RECONNECT TO EXISTING PAD–MOUNTED TRANSFORMER. ⬡ 2

WALKER LIFT STATION ELECTRICAL SITE PLAN

SCALE: 1"=5'-0" WHEN PRINTED AT 24x36

0 5' 10'

N

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egis GROUP
BLN BEAM·LONGEST·NEFF

REVISIONS AND ISSUES	DATE	BY
ADDENDUM #2	12/09/2024	WRK

WILLIAM R. KASSEBAUM
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WALKER LIFT STATION ELECTRICAL SITE PLAN

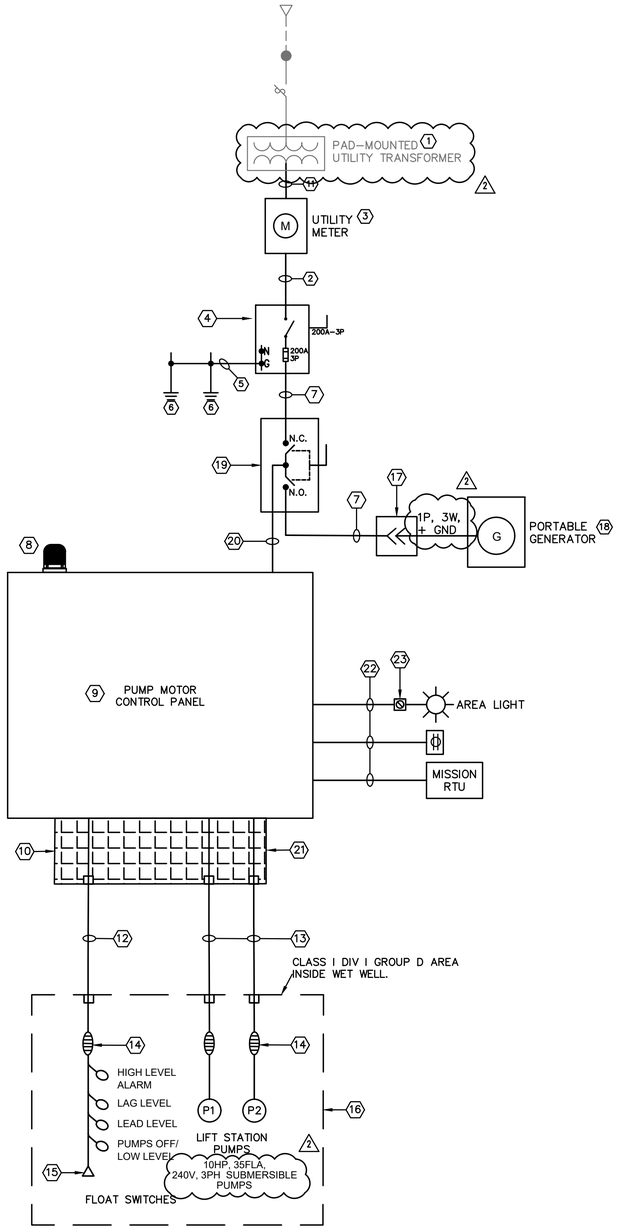
PLAN DATE: NOVEMBER 13TH, 2024

DESIGN:	CHECK:	DRAWN:
WRK	WRK	CAG

PROJECT NO. **220060**

SHEET NO. **E603**

Z:\Projects\2023\2023133 Town of Montgomery, IN WW Improvements \20 CAD Current Working\E603 - Lift Station #2 Electrical Site Plan.dwg Monday, December 9, 2024 11:31:40 AM



WALKER LIFT STATION POWER ONE-LINE DIAGRAM

SCALE: NONE

CONDUIT REQUIREMENT NOTES:

A. USE GALVANIZED RIGID STEEL FOR ALL EXTERIOR CONDUIT ABOVE GRADE, PVC CONDUIT UNDERGROUND.

B. USE MEYERS HUBS OR SEALING LOCKNUTS FOR ALL NON-CLASSIFIED CONDUIT INSTALLATION.

C. PROVIDE STAINLESS STEEL HARDWARE FOR ALL EQUIPMENT INSTALLED IN WET WELL; THIS INCLUDES BUT NOT LIMITED TO KELLEMS CABLE GRIPS, CABLE RACKS, MOUNTING BRACKETS. BOLTS AND NUTS.

D. WET WELL CLASSIFICATION IS CLASS 1 DIVISION 1 GROUP D; ALL WIRING METHODS SHALL COMPLY.

E. AREA WITHIN A 3' RADIUS FROM THE WET WELL HATCH AND VENT IS CLASS 1 DIVISION 2 GROUP D RATED.

ELECTRICAL KEYED NOTES:

1. EXISTING 120/240V, 1PH, 3W PAD-MOUNTED TRANSFORMER.
2. 3-#3/0 CU, 2" C.
3. UTILITY METER MOUNTED TO EQUIPMENT RACK.
4. SERVICE ENTRANCE RATED FUSED DISCONNECT SWITCH, 100A, 480V, 3PH, WITH NEUTRAL BOND KIT AND WITH GROUND LUGS, WITH GND, NEMA 4 PAINTED STEEL, MINIMUM 14KAIC.
5. #6 BARE CU GROUND ELECTRODE CONDUCTOR, 3/4" C.
6. (2) 5/8" X 8' CU CLAD GROUND RODS. BURIED 12" BELOW GRADE, SPACED 10' APART.
7. 3-#3/0 CU, 1-#6 CU GND, 2" C.
8. NEMA 4X ALARM BEACON.
9. LIFT STATION PUMPS MOTOR CONTROL PANEL. REFER TO CONTROL PANEL LAYOUT SHEET AND MOTOR CONTROL WIRING DIAGRAM SHEET. FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR.
10. VENTILATED SHEET METAL WIREWAY BELOW PANEL.
11. 4" PVC C. FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR, CONDUCTORS BY UTILITY COMPANY.
12. FLOAT SWITCH CABLES IN 2" C. PVC BELOW GRADE AND RIGID STEEL ABOVE GRADE. CABLES SHALL BE CONTINUOUS TO PUMP CONTROL PANEL AND NOT SPLICED. PROVIDE ADEQUATE LENGTH FROM MANUFACTURER.
13. 3-#6 CU, 1-#8 CU GND FOR PUMP WIRING. SEAL FAIL, OVERTEMP CABLES, AND PUMP WIRING INSTALLED IN COMMON 2"C; ONE 2"C. FOR EACH PUMP.
14. ALL CABLE SUPPORTS SHALL BE WITH KELLEMS GRIPS.
15. WEIGHT FOR CABLE.
16. WET WELL.
17. GENERATOR RECEPTACLE WITH PIN & SLEEVE STYLE CONNECTION, TO MATCH GENERATOR CORD SET.
18. MOBILE GENERATOR PROVIDED BY OWNER. MINIMUM 60KW.
19. 200A, 240V, 1PH, NF, 2P-DT MANUAL SELECTOR SWITCH WITH INSULATED NEUTRAL BLOCK AND EQUIPMENT GROUND BLOCK, NEMA 4 PAINTED STEEL ENCLOSURE, MINIMUM 14KAIC.
20. 3-#3/0, 1-#6 EQUIP. GND., 2" C.
21. CABLE GLAND FITTING, CLASS I, DIV II RATED.
22. 2-#12 CU, 1-#12 CU GND, 3/4" C. PROVIDE 1P-20A BREAKER FOR ACCESSORY LOADS.
23. NEMA 4X ON-OFF SELECTOR SWITCH FOR AREA LIGHT.

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WALKER LIFT STATION POWER ONE-LINE DIAGRAM

PLAN DATE: NOVEMBER 13TH, 2024

DESIGN:	CHECK:	DRAWN:
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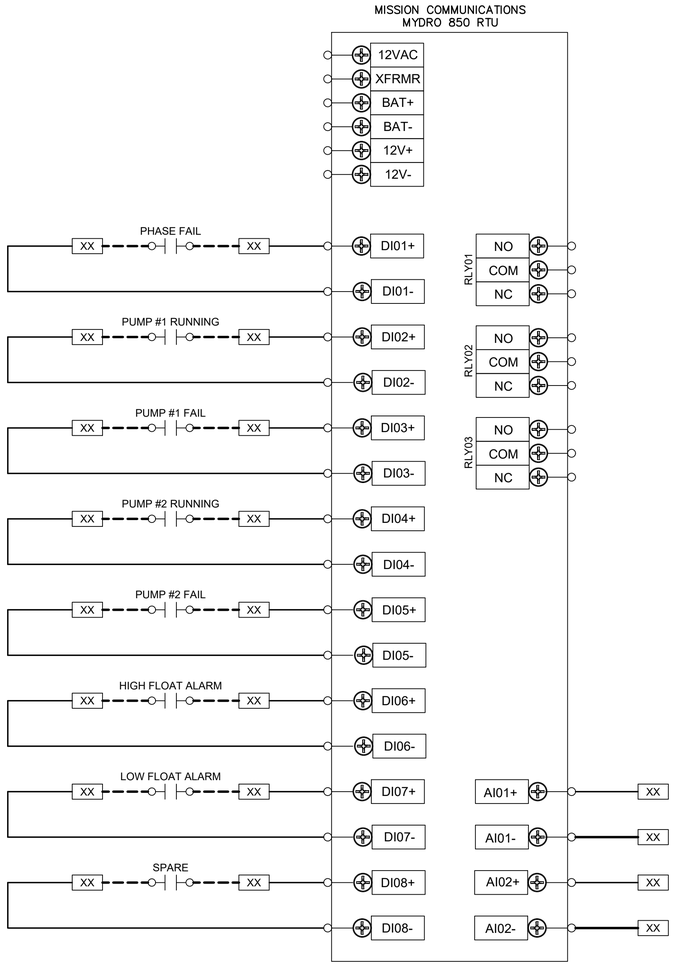
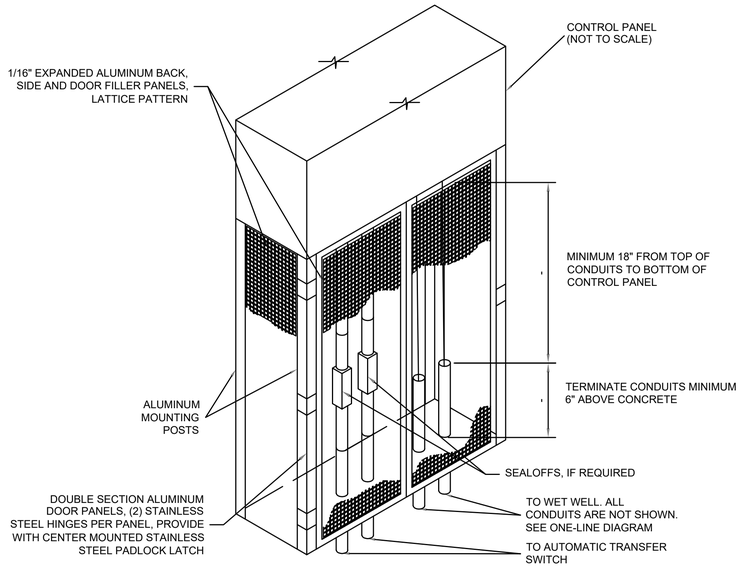
PROJECT NO. 220060

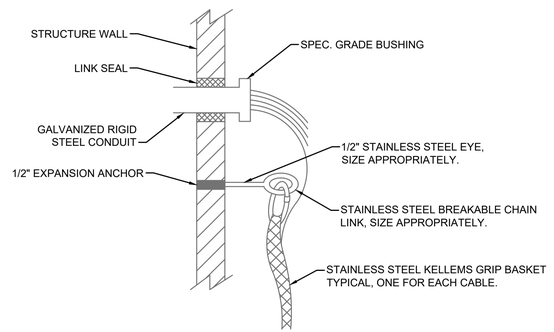
SHEET NO. E604





CONTROL PANEL AIR-BREAK

NO SCALE (CONCEPTUAL)



CABLE SUPPORT DETAIL

NO SCALE (CONCEPTUAL)

WALKER LIFT STATION ELECTRICAL DETAILS

SCALE: NONE

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WALKER LIFT STATION ELECTRICAL DETAILS

PLAN DATE: NOVEMBER 13TH, 2024

DESIGN:	CHECK:	DRAWN:
WRK	WRK	CAG

PROJECT NO. 220060

SHEET NO. E605