

**HENRY COUNTY BOARD OF COMMISSIONERS  
MEMORIAL PARK SANITARY AND WATER IMPROVEMENT PROJECT**

**Addendum #1**

August 7, 2026

*Bid Date:* August 12, 2026

*Bid Time:* 11:00 a.m. (local time)

*Owner:* Henry County Board of Commissioners  
101 S. Main Street  
New Castle, IN 47362

*Engineer:* United Consulting  
8440 Allison Pointe Blvd., Suite 200  
Indianapolis, IN 46250  
Telephone: (317) 895-2585

The following items are a revision/clarification to the requirements of the Contract Bid Documents for this Project. The articles contained in this Addendum take precedence over the requirements of the previously published Contract Bid Documents. Where any article of the Specifications or any detail of the Drawings is modified or deleted by the article contained in the Addendum, the unaltered provisions of that article paragraph, subparagraph, or clause shall remain in effect.

**The Bidder must acknowledge receipt of this Addendum by acknowledgement on the Proposal Form (Specification Section 00300). Failure to do so will result in bid rejection.**

**Item #1:** **Clarification:** Pay Item #1 – 4" DR-11 HDPE Sanitary Force Main

Pay Item #1 – 4" DR-11 HDPE Sanitary Force Main can be installed by open-cut or trenchless installation.

**Item #2:** **Clarification:** Pay Item #6 – 8" C900 PVC Water Main

Pay Item #6 – 8" C900 PVC Water Main can be installed by open-cut or trenchless installation. If trenchless installation is preferred, the water main material shall be 8" C900 Certa-Lok Restrained Joint Integral Bell PVC.

**Item #3:** **Clarification:** Pay Item #7 – 10" DR-11 HDPE Water Main by Trenchless Installation

If Pay Item #6 – 8" C900 PVC Water Main is constructed by trenchless installation using 8" C900 Certa-Lok Restrained Joint Integral Bell PVC, then the pipe material and pipe size for Pay Item #7 – 10" DR-11 HDPE Water Main by Trenchless Installation shall also be 8" C900 Certa-Lok Restrained Joint Integral Bell PVC.

**Item #4:** **Clarification:** Existing Expo Building Sanitary Flow

There is no existing sanitary flow coming from the existing Expo Building since the building does not have water or sewer service. Bypass pumping of the existing sewer is not required. There may be some groundwater or standing water within the existing manholes and sewers that should be pumped out prior to connecting the proposed sanitary sewer.

**Item #5:**    **Revision:** Plan Sheet No. 4 and 15

The invert elevation of the proposed 8" sanitary sewer at the existing manhole shall be revised to 1048.41 in lieu of 1048.51. Revised plan sheets are included with this Addendum.

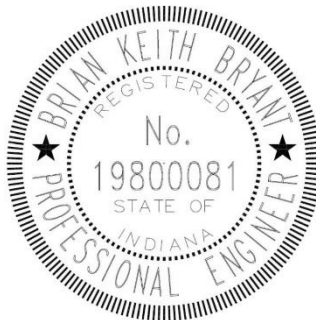
**Item #6:**    **Revision:** Specification Section 11300, Part 2, 2.6, H. Battery Backup

The battery backup for the lift station control panel shall be deleted in it's entirety. Revised Specification Section 11300 is included with this Addendum.

**Item #7:**    **Revision:** Specification Section 11300, Part 2, 2.6, J. Pump Controller

Pump operation and control logic commands shall be carried out using relay logic with float inputs. Revised Specification Section 11300 is included with this Addendum.

This Addendum reviewed and approved by:



08/07/2026

A handwritten signature in blue ink that reads "Brian Keith Bryant".

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Brian Keith Bryant, P.E.  
Reg. Engineer No. 19800081  
State of Indiana

**END OF ADDENDUM NO. 1**



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## **SECTION 11300 - PUMPING STATIONS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of contract, including General and Supplementary Conditions Division 1 specification sections, Division 2 specification sections, and all other applicable specification sections, apply to work of this section.

#### **1.2 DESCRIPTION OF WORK**

- A. The specifications shall govern all work necessary to furnish, install and place into operation the electrical submersible pump station and appurtenances required to complete this project.
- B. Work shall include, but not be limited to wet well structure, valve vault structure, piping, valves, submersible pumps, electrical service, control systems, and other necessary appurtenances.
- C. Materials of construction for the pumps and related equipment shall be suitable for the environment in which they are to be located. All hardware located in the wet well shall be stainless steel.

#### **1.3 REFERENCES**

- A. Pumping station shall be in conformance with requirements of the Indiana Department of Environmental Management and all applicable industry codes and laws.

#### **1.4 GENERAL**

- A. All Work shall be inspected, tested, and approved as required by federal, state, and local rules and regulations and as specified in this section. Unless otherwise approved in writing before testing begins, all tests shall be witnessed by the OWNER, ENGINEER, and others as necessary. Test results shall be recorded and reports or appropriate certificates shall be submitted to the ENGINEER.
- B. All of the mechanical and electrical equipment shall be an integral package supplied by the pump manufacturer with local representation so as to provide undivided responsibility.
- C. Any proposed alteration of the lift station dimensions, equipment, controls, etc. from the standards set forth herein will be approved only upon submittal of the plans and specifications of the proposed changes to the ENGINEER and OWNER, and upon the ENGINEER's written approval. No alternate approvals of equipment or accessories shall be made prior to the submittal of the bid.

- D. All electrical equipment and accessories within the wet well shall be rated for continuous duty in Class I, Division I, Group D hazardous and/or explosive environment.
- E. The lift station equipment shall be designed to operate on 230 volt, single phase power. CONTRACTOR shall confirm available power voltage and configuration onsite prior to preparation of the station shop drawings. The contractor shall further coordinate with the electric utility and provide materials and installation as necessary for the proposed electrical service.

## **1.5 SUBMITTALS**

- A. Manufacturer's Data: Submit manufacturer's data, specifications, installation recommendations and warranty data for each item specified herein.
- B. Provide product data on all equipment and devices specified herein, as well as, wiring schematics for all systems.
- C. In order to maintain unit responsibility and warranty on the pumping equipment and control center, the controls must be accepted in writing by the pump manufacturer, as suitable for operation with the pumping equipment. This acceptance shall be submitted to the ENGINEER with the control center submittal.
- D. Submittals shall comply with the requirements of specification section 01300.

## **1.6 OPERATION AND MAINTENANCE DATA**

- A. Operation and Maintenance data submittals shall be in accordance with Section 01650. Submittal to include spare parts data listing, source, and current prices of replacement parts and supplies, recommended maintenance procedures and intervals.

## **1.7 DELIVERY, STORAGE, AND HANDLING**

- A. The CONTRACTOR shall exercise adequate care during transportation, handling, storage, and installation to ensure equipment and materials are not damaged.
- B. If any part or parts of equipment or materials become damaged or otherwise before or during installation, then repair and/or replacement shall be at CONTRACTOR's expense before proceeding further.

## **1.8 WARRANTY**

- A. CONTRACTOR's Warranty
  - 1. The CONTRACTOR shall guarantee each pump and associated components to be free from defects in material and factory workmanship for a period of one year from the date of Utility Acceptance of the lift station for operation and maintenance.

2. The CONTRACTOR shall furnish and install a replacement for any component which proves defective during the warranty period, except such items which are normally used in services such as oil and grease.

**B. MANUFACTURER's Warranty**

1. The pumps shall have a five (5) year manufacturer's written warranty from the date of substantial completion. The warranty shall include full coverage of pumps parts and labor for the first 18 months and prorated parts coverage from month 19-60.
2. All other station equipment shall have a manufacturer's warranty for a period of at least two (2) years from the date of substantial completion.

## **PART 2 - PRODUCTS**

### **2.1 WET WELL, VALVE VAULT**

- A. The wet well and valve vault are to be constructed of precast concrete meeting the requirements of ASTM C-478. Minimum valve vault and wet well dimensions shall be as indicated on the plans. The actual arrangement of the structures is shown in the plans. The wet well top shall be provided with a four (4) inch ductile iron vent having a downward pointing inlet and stainless steel screen over the inlet opening.
- B. Structure flat tops and base slabs are to be constructed of precast reinforced concrete manhole sections conforming to ASTM C-478. All joints between precast sections shall be made with an approved rubber O-ring in accordance with ASTM C-443 and a ½ inch diameter non-asphaltic mastic conforming to AASHTO M-198 and Federal Specification SS-521-A. In addition, the outside wall below grade is to be coated with an exterior waterproof coating. Joints to be sealed in the field after installation. Structures shall be as further specified in Specification Section 02500 and as shown on the plans. Structures shall be placed on a minimum of twelve (12) inches of leveled and compacted #8 crushed limestone.

### **2.2 PIPE AND PIPE FITTINGS**

- A. All piping and fittings located within lift station structures and between structures shall be ductile iron with flanged joints. Pipe shall meet the requirements of ANSI/AWWA C151/A21.51. Ductile iron pipe shall be Thickness Class 53. Flange joints shall be screwed on ductile iron flanges or shouldered type joints. Flanges shall meet the requirements of ANSI/AWWA C115/A21.15, and shouldered type joints shall conform to ANSI/AWWA C606. Field made-up flanges will not be allowed unless approved in writing by the ENGINEER. Then, these shall comply with ANSI/AWWA C115/A21.15 with facing done after turning pipe through flange. Fittings shall follow ANSI/AWWA C110 and be designed and manufactured for a pressure rating of 250 psi. Fittings shall have flange joints or shouldered type joints. Flange joints shall meet

the requirements of ANSI/AWWA C110 while shouldered type joints shall correspond to ANSI/AWWA C606.

- B. Gaskets for flange joints shall meet the requirements of ANSI/AWWA C110, be full face and rubber or another material approved by the ENGINEER, and must have an 1/8-inch thickness. Nuts and bolts shall conform to ANSI/AWWA C110 and shall be stainless steel. Shouldered joint accessories shall follow ANSI/AWWA C606.
- C. Interior of ductile iron pipe and fittings shall be lined with standard cement lining ANSI/AWWA C104 A21.4.
- D. Exterior surfaces of ductile iron pipe and fittings shall be coated as specified in Section 09900.

### **2.3 VALVES**

- A. Refer to Section 11100 for specific valve requirements.
- B. A minimum clearance of twelve (12) inches shall be maintained from any wall or bottom of structure to any valve or pipe fitting flange.
- C. Exterior surfaces of all ductile iron / cast iron valves shall be coated as specified in Section 09900.

### **2.4 PUMPING EQUIPMENT**

#### **A. PUMP DATA**

|            |                                     |
|------------|-------------------------------------|
| Model      | KEEN PUMP KG(X)5, or approved equal |
| No. Pumps  | 2                                   |
| Duty Point | 120 gpm @ 41.5' TDH                 |
| Power      | 5 hp, 1 Phase, 230 volt, 3450 rpm   |

#### **B. SUBMERSIBLE MOTOR CONSTRUCTION**

1. All castings in the stator housing construction shall be ASTM A48 Gray Cast Iron Class 35.
2. The submersible motor stator and rotor shall be of an induction type, NEMA® L (Single-Phase).
3. The stator is to be press-fit in watertight, oil-filled, TENV chamber to provide the maximum heat dissipation.
4. The armature assembly of the motor must meet or exceed the balance specification as defined in ISO 1940 G2.5.

5. Stator housing shall be filled with clean, high dielectric oil that lubricates bearings and seals, transferring heat from windings and rotor to the outer cast housing.
6. Supplier to provide a synthetic blend oil with wear-additives, specifically engineered for submersible pump motors to ensure low operating temperatures.
7. Submersible motor design:

|                     |            |
|---------------------|------------|
| 5                   | Horsepower |
| 3,450               | RPM        |
| 230                 | Voltage    |
| 1                   | Phase      |
| 1.20 Service Factor |            |
8. Insulation system of the submersible motor design shall be of Class N as defined in NEMA® MG-1 and established in accordance with IEEE® std. 1 rated for 392° F (200° C). To include:
  - i. The stator windings shall be constructed of material to meet the Class N insulation system.
  - ii. The insulation varnish in the system must be applied in a dip and bake manner.
  - iii. Stator lead material must meet or exceed Class N insulation system.
  - iv. Thermal limiting device shall be designed, secured to the stator and constructed to meet the Class N insulation system.
    - a. The thermal limiting devices shall be attached to each phase winding.
    - b. The thermal limiting devices shall be used in conjunction with and supplemental to external motor overload protection and must be connected to the motor control center.
9. Operation of the motor shall be designed for:
  - i. Handling pumped media of 140° F (60° C) ambient and shall not exceed NEMA® Class H operating temperature rise of 176° F (80° C).
  - ii. Capable of 10 evenly spaced starts per hour.
  - iii. A combined service factor, in combination with effect of voltage, frequency and specific gravity, shall be at a minimum of 1.00.
    - a. Acceptable voltage variation is +/- 10%.
    - b. Acceptable frequency variation is +/- 5%.

**C. SUBMERSIBLE MOTOR CORD ENTRY CONSTRUCTION**

1. The cord entry housing shall be ASTM® A48 Grey Cast Iron Class 35.

2. Power and control cables shall be secured and sealed to the submersible motor. Construction shall be of a method to provide anti-wicking barriers to the submersible motor.
  - i. The outer jacket of the power and control cables shall be sealed with an agency-approved, watertight strain relief cord grip fitted with a nitrile compression grommet or rubber compression grommet.
  - ii. The connections between the power cable and the stator leads and control cable and the internal motor control leads shall be potted and encapsulated in a two-part epoxy in the cord entry system.
3. All bolted connections in the cord entry construction shall be:
  - i. Secured with 304 stainless steel fasteners.
  - ii. Secured joints in the construction shall be compression fitted with fluorocarbon o-rings.
4. The power and control cables shall be recognized by Underwriters Laboratory® (UL) & Canadian Standard Association® (CSA) and will be delivered in a standard length of 40 foot.
5. The cord entry housing shall be fitted with a stainless steel lifting bale sized and of adequate design to securely lift the complete construction of the submersible grinder pump.
6. The power and control cables shall be jacketed in a material suitable for submersion, oil resistant, and be flexible for portable installation.
7. Cable sizing shall be in accordance to NEC® specifications.

#### D. MECHANICAL SEALS

1. Each pump shall be constructed with a tandem mechanical shaft seal system incorporating two independent shaft seal assemblies.
2. Seals shall operate in a lubricant reservoir that hydro-dynamically lubricates the seal faces at a constant rate.
3. Inboard and outboard seal construction shall be of the following material:
  - i. Primary stationary ring shall be constructed of silicon carbide face material.
  - ii. Primary rotating ring shall be constructed of silicon carbide face material.
  - iii. Elastomers shall be constructed of Viton® materials.
  - iv. Metal components shall be constructed of stainless steel for corrosion resistance.
4. The inboard shall be hydro-dynamically lubricated and operated in a sealed oil reservoir.

5. The inboard seal chamber seal shall be designed and constructed to prevent lubricant over-filling and provide adequate lubricant expansion to avoid over-pressuring of the seal.
6. The pump shall be capable of operating in the clockwise or counter clockwise direction without damaging the seal faces.
7. The pump shall be capable of operating in a dry environment without damage to the seal faces.
8. Class 1, Division 1, explosion-proof models shall contain an additional line bearing seal constructed of bronze, CDA836 material, and is mounted in the lower seal housing. **This is required for pumps in this project.**
9. The line bearing seal will minimize shaft deflection and serve as the flame path for the motor assembly.

#### E. PUMP BEARINGS

1. Bearings shall be designed to an ABEC® System 1 or better.
2. Each pump shall be constructed with a two-bearing system design.
  - i. The upper bearing shall be a Conrad type, single row, deep groove ball bearing designed to adequately handle the required radial loads.
  - ii. The lower bearing shall be a Conrad type, single row, deep groove ball bearing designed to adequately handle the required radial loads.
3. The bearings shall be designed to deliver a minimum L-10 bearing life of 100,000 hours when operation is within the limitations of the manufacturer's performance curve.
4. The bearings shall be lubricated in oil and will not require maintenance as described in ANSI/HI 1.4-2010 A.6.

#### F. PUMP SHAFT

1. The pump shaft shall be an extension of the motor shaft. Any other construction that would include coupling of two shafts is not acceptable.
2. The pump shaft shall be a Ferritic grade AISI® Type 400 series stainless steel.
  - i. Pump shaft material crystal structure shall be body centered cubic (bcc).
  - ii. Pump shaft shall be of a ferromagnetic material.

#### G. IMPELLER

1. Material shall be ASTM® A536 ductile cast iron. ASTM® A48 gray cast iron shall be unacceptable.
2. The design shall be one-piece, 10-vane, vortex flow and dynamically balanced to ISO 1940 G6.3.
3. The impeller shall be designed with pump out vanes on the back shroud of the pump impeller to prevent the pump media from entering the outboard seal cavity.
4. The impeller shall be threaded to the pump shaft.
  - i. All wetted fasteners shall be of a corrosion resistant stainless steel material.

#### H. GRINDING MECHANISM

1. The grinder assembly shall consist of a single rotating grinding cutter and stationary grinding ring secured to the inlet of the volute case.
  - i. The rotating grinding cutter shall be threaded onto the pump shaft and secured with a washer and bolt.
  - ii. The stationary grinding ring shall be secured in place with a metal clamping ring.
2. Both the stationary and rotating grinding mechanisms shall be removable without disassembling the pump.
3. No adjustment or shimming grinder assembly shall be necessary.
4. The grinder components shall be constructed of a martensitic AISI 440C stainless steel hardened to 56-60C Rockwell.
5. The grinder mechanism shall be capable of producing 17,250 cuts/second.

#### I. VOLUTE CASE

1. Each pump shall be constructed with a tandem mechanical shaft seal system incorporating two iDesign shall be a single piece and a modified constant velocity.
2. Constructed of smooth passage ways large enough that any macerated solid can enter the impeller.
3. The discharge is to be of a horizontal centerline configuration.
4. The discharge is to be 3" ANSI® standard Class 125, 4-bolt configuration.

## **2.5 CONTROL CENTER ENCLOSURE**

- A. The control center shall be built in a NEMA 4X, stainless steel enclosure, sized to accommodate the required pumping equipment. The enclosure shall include a drip shield, and be of 14 gauge stainless steel (minimum), welded construction. The outer door of the panel shall be continuous hinged dead front with a 3-point latch mechanism with provisions for locking with a padlock. Inside shall be a separate hinged panel to protect all electrical components. Hand-Off-Auto switches, run lights, circuit breakers, etc. shall be mounted such that only the faces protrude through the inside swing panel and no wiring is connected to the back side of the inside swing panel. Panels shall include a door stop kit, data pockets for panel wiring diagrams and a minimum 18-inch LED light and switch. Dual door panels shall open away from each other for unobstructed access to the control center enclosure.
- B. Panels shall include non-fused, main disconnect with interlock to prevent opening the panel with switch in "On" position. A defeater shall be provided to bypass this interlock, with handle lockable in "Off" position.
- C. The equipment mounted within the enclosures shall be mounted on the enclosure back panel, neatly organized, and shall be in accordance with the manufacturer's recommendations.
  - 1. All wiring within control panels shall be insulation-type MTW, minimum size 16 AWG. Wiring within the enclosure shall be routed through plastic wiring troughs with removable covers. Maximum fill for wiring troughs shall be 60%. Terminal strips located adjacent to wiring troughs shall have a minimum of 2-inches between terminal strip and trough. All wiring in control panels not in wiring troughs shall be bound with continuous-type spiral windings.
  - 2. All I/O devices shall be wired to rail mounted terminal blocks. Plastic wiring duct shall be Electrovert "Electro-duct," Panduit, or equal. Terminal blocks shall be Electrovert 9700 Series, Square D, Class 9080 Type G, or equal.
  - 3. Field wiring in dry locations shall be insulation-type THHN, minimum size 14 AWG. Field wiring in damp or wet locations shall be insulation type XHHW-2, minimum size 14 AWG. All field wiring shall terminate at rail mounted terminal blocks. Field wiring terminals shall be clearly identified as to which I/O terminals they are wired. Wire markers shall be permanently attached, wraparound adhesive, or heat-shrink type markers. Wire numbering preprinted on the conductor and individual wraparound numbers are not acceptable.
  - 4. Jumpers between adjacent terminal blocks shall be copper jumper bars supplied by the terminal block manufacturer.
  - 5. All panels with DIN rail mounted equipment shall include a minimum of 25% spare DIN rail space.

6. In addition to spare I/O specified herein, provide a minimum of 25% spare hot and neutral terminals, wired to terminal strips. Spare terminals shall be provided for all voltage sources within the panel (e.g. 120V, 24V).
- D. All wiring shall be done in the factory, Class II, Type C with master terminal strips for exterior connections. Terminal blocks shall be mounted either at the bottom or on the side of the enclosure, depending where the I/O conduits penetrate the enclosure. Splices are not allowed within enclosures or wireways.
- E. All internal wiring shall be color coded and numbered, and each wire shall be terminated on terminal strips. Schematic and wiring layout drawings, following JIC standards, which show all connections to external devices, a complete bill of materials, interior and exterior panel layouts, and a detailed description of operation shall be submitted for each control panel.
- F. All door-mounted devices shall be furnished flush-mounted, and an exterior engraved phenolic nameplate (laminated white plastic with black characters) worded by the manufacturer and reviewed by the ENGINEER shall be provided for each compartment, device, light, etc. All components within the enclosures shall be identified with interior mounted engraved labels. Labels shall be installed on the enclosure back-panel and not on the device or wireway. Devices shall be grouped for each device or unit being controlled.
- G. The bottom of the control panel shall have vented cable guard consisting of stainless steel expanded metal mesh panels to vent sewer gases from the wet well to the atmosphere. All cable entrances to the control panel shall include strain relief and be sealed with a cord grip. The vented cable guard shall be anchored in place with threaded stainless steel fasteners to allow access to the cables and cord grips by removing either the entire cable guard assembly or one or more of the side panels.

## **2.6 CONTROL CENTER EQUIPMENT**

### **A. General**

1. All indicating and recording devices shall be electric or electronic.
2. Power supplies shall be protected against short circuits and contain their own overcurrent and overvoltage protection. 12 and 24 VDC power supplies shall be provided and installed in the enclosures for powering all analog input signals where required.
3. All motor control power shall be 120 volt with suitable circuit protection fuses or breakers. Fuse holders shall be provided with integral LEDs to indicate when the fuse is blown.

4. Devices powered at 120 volts from control panels shall be fused. This shall include, but not be limited to, solenoid valves, motor operated valves, motorized ball valves, flow meters, scales, transducers, etc.
  5. Molded case thermal-magnetic circuit breakers shall include integral thermal and instantaneous magnetic trip in each pole. Motor controllers shall include molded case circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Nonfusible switch assemblies shall consist of quick-make, quick-break load interrupter enclosed knife switch with externally operable handle.
  6. General Purpose Relays: UL Listed with On-Off flag-type or LED indicator.
  7. Timing Relays: UL Listed with On and Timing Out LEDs.
  8. Contactors: All contactors for starters shall be NEMA rated. IEC contactors are not allowed. Contactors shall be Allen Bradley, Bulletin 509, or equal.
- B. Each panel shall have an externally mounted GFI, duplex, 20 ampere, 120 volt receptacle.
- C. Provide dedicated 20A, 120 volt circuit breakers for the following:
1. Control Circuit
  2. Heater / Thermal Management
  3. Enclosure Receptacles
  4. Interior Lighting
  5. Spare
- D. Condensation Heater
1. The control center shall include an adjustable thermostatic controlled 120V AC condensation heater sized to maintain panel internal temperature of a minimum of 55° F. The heater shall be placed so as not to damage any other component or wiring in the control center. Condensation heater shall be as manufactured by Hoffman, Model D-AH, X000 Series, sized as required, or approved equal.
- E. Alarm light and alarm horn.
1. Alarm light shall be a NEMA 4X red-flashing globe-type alarm light, with a lexan-type cover and wire shield. Light shall be installed on exterior of the control panel enclosure and be readily visible.
  2. Alarm horn shall be NEMA 4X mounted near the alarm light on exterior of the control panel enclosure.
  3. A push to test horn and light button; as well as, a push to silence horn button shall be provided and mounted on the side of the control panel enclosure.

4. All alarms shall automatically reset when alarm condition(s) has cleared. An adjustable 0-15 minute time delay relay shall be reactivated and timed out prior to transmitting the high wet well level condition.

F. Starters

1. Panel to include UL approved motor starters for each pump.

G. Lightning Protection

1. The control center shall include integral transient voltage surge suppression for both lightening and surge protection. The device shall include the following:
  - a. 160kA per phase / 80kA per mode
  - b. UL 1449 Listed
  - c. LED status indication
  - d. Form C dry contacts for monitoring.

~~H. Battery Backup~~

- ~~1. The battery back-up power supply with charger shall be provided to allow control operation on loss of 120V AC power. The UPS shall supply 120VAC to the 24VDC power supply that supplies DC power for the PLC and OIT. The unit shall be sized to operate equipment for a period to be no shorter than two (2) hours at full system load.~~

I. Heat Sensors

1. The control center shall incorporate connections for heat sensors which are installed in the pumps. The connection shall disconnect the starter upon high temperature signal and require manual reset.

J. Seal Fail Sensors

1. The control center shall incorporate connections for seal failure sensors which are installed in the pumps. The panel will have a seal failure alarm light for each pump. This alarm indicates failure of the lower mechanical seal in the pump. This will be an alarm light only and will not shut down the pump.

K. Pump Controller

1. Automatic pump operation and all control logic commands shall be carried out using relay logic with float inputs.

## **2.7 CONTROL CENTER – INNER PANEL MOUNTED DEVICES**

### **A. General Requirements**

1. Pushbuttons: Heavy-duty, oil-tight, 30 mm.
2. Indicating Lights: Heavy-duty, oil-tight, 30 mm, LED type, push to test.
3. Selector Switches: Heavy-duty, oil-tight, 30 mm.

### **B. Indicating lights shall be provided as follows:**

1. WET WELL HIGH WATER LEVEL (Local indication Red)
2. PUMP NO. 1 RUN (Local indication Green)
3. PUMP NO. 2 RUN (Local indication Green)
4. PUMP NO. 1 SEAL FAIL (Local indication Amber)
5. PUMP NO. 2 SEAL FAIL (Local indication Amber)
6. PUMP NO. 1 OVER TEMPERATURE (Local indication Red)
7. PUMP NO. 2 OVER TEMPERATURE (Local indication Red)
8. BACKUP LEVEL CONTROL ACTIVE (Local indication Red)

### **C. Selector switches shall be provided as follows:**

1. “HAND-OFF-AUTO” switch for each pump. The “HAND” mode shall be hardwired for manual operation, non-spring return.

### **D. Reset push buttons shall be provided as follows:**

1. Common Reset for each pump
2. Primary Level Control Reset

### **E. Elapsed Time Meters**

1. The control center shall include an hour meter for each pump to register the elapsed operating time of each pump. The meter shall be the non-resettable type and indicate the number of hours of pump operation. The meter shall be enclosed in a 3-inch round, dust and moisture-proof molded plastic case. The flush mounted dial shall register in hours and tenths of hours up to 99,999.9 hours before repeating.

### **F. The OIT display shall be mounted on the inner door.**

## **2.8 LEVEL CONTROL DEVICES**

### **A. Level sensors shall be sealed float type switches for backup control and alarm signal. The floats shall be constructed of a durable ABS material that is leak proof, shock proof and impact resistant.**

1. The level sensors shall be rated for low volt operation at milliwatt levels. Floats shall operate at a maximum of 24 volt control voltage.

2. Floats shall be mercury type meeting the requirements for Class 1, Division 1, Group C & D or “intrinsically safe” for installation in an explosion hazard environment.
3. Each level sensor shall be furnished complete with sufficient cable length to run to the terminal box below the pump station controller and leave slack for future level adjustments. The support wire shall have a heavy Neoprene jacket and a weight shall be attached to the cord above the float to hold the float in place in the sump.
4. The Contractor shall furnish a stainless steel bracket mounted in the hatch opening for hanging the float cables.
5. Provide stainless steel strain relief cable grips.

## **2.9 DOUBLE THROW SWITCH / EMERGENCY POWER**

- A. The pump station shall be designed to operate with a portable emergency power system.
- B. A service entrance rated manual double throw switch shall be provided for utility power and portable emergency generator connection. The switch shall be as indicated in the Drawings as manufactured by Eaton or approved equal. Double throw switch enclosure shall be NEMA 3R with provisions for a padlock.
- C. Generator connection receptacle shall be standard for rental and purchased portable generators in the area. Lift station power supply (phase & voltage) shall be clearly labeled on the outside of the double throw switch enclosure. Receptacle assembly shall be weatherproof consisting of a mounting box suitable for outdoor installation, securely anchored to the equipment panel stand.

## **2.10 SYSTEM OPERATION**

### **A. GENERAL**

1. The Pump Control Panel shall provide both manual and automatic control of the lift station pumps.
2. The following pump interlocks shall prevent operation of pump in both the automatic and manual modes of pump control. Except where noted the pump shall be shutdown and remain unavailable for operation until reset by operator.
  - i. Pump winding high temperature.
  - ii. Pump fail to start.
3. Pump on, off, and setpoint levels, timer values, minimum speed settings shall be adjusted at time of system start-up with input from pump supplier. Ranges for

current input signals shall be coordinated with pump supplier. Settings for high and low current alarms shall be coordinated with pump supplier. All setpoints, timer values, etc. shall be field adjustable at the pump controller.

4. Pump backspin protection timers to prevent restart of pump after shutdown until timer has timed out shall be provided. Timers shall be active in both the manual and automatic modes of control. Initial timer settings shall be 60 seconds.
5. Time delay on pump required outputs, initially set at 10 seconds and 20 seconds to prevent simultaneous pump restart on restoration of control power shall be provided. Timers shall be active in both the manual and automatic modes of control.

#### **B. AUTOMATIC OPERATION**

1. Once activated, the float system will start the pumps as required based on a four float sequence: Off, Lead On, Lag On and High Water Alarm.
  - i. The pumps shall sequence on in a selected time delay manner.
  - ii. The pumps will sequence off only when the wet-well level reaches the "stop" pump float level and the pumps shall then alternate. The alternator shall also allow for the lead pump to be manually selectable.
  - iii. Failure or unavailability of pump due to manual placement in the off position or presence of an interlock preventing pump operation shall override pump sequence controls. Failed or unavailable pump shall automatically be skipped in sequence.
  - iv. Pumps shall automatically alternate with each cycle.

#### **C. MANUAL OPERATION**

1. Manual operation of the lift station pumps shall be selected by switching the "Hand/Off/Auto" selector switch to the Hand position. The pump shall start when switched to the Hand position and stop when switched to the Off position or when the low level float is energized. Interlocks and alarms for manual pump operation shall be the same as those listed for automatic pump control.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. The lift station equipment shall be installed complete as shown on the plans and described herein and in accordance with the equipment manufacturer's recommendations.

### **3.2 SPARE PARTS**

- A. CONTRACTOR shall supply a minimum of 1 spare for each type of relay, contact, indicator light, fuse, etc. in the panel that are subject to replacement within the first 5 years of operation.
- B. An itemized list of spare parts shall be provided at the time of delivery for OWNER review and acceptance. Provide the ENGINEER with written/signed receipt of spare parts inventory list.

### **3.3 TESTING & START-UP SERVICES**

- A. Prior to the ENGINEER's final inspection of the pumping equipment, the CONTRACTOR shall be responsible for coordinating start-up activities with the pump manufacturer's representative in accordance with the manufacturer's requirements. The ENGINEER's Representative must be present at the time of manufacturer's start-up.
- B. The CONTRACTOR shall provide the services of a factory trained manufacturer's representative for a minimum of one (1) day on-site for pump installation inspection, place the equipment into operation, instruct personnel in the operation and maintenance of equipment and to demonstrate satisfactorily the performance of each piece of equipment.
- C. The CONTRACTOR shall coordinate with subcontractors to assist with start-up activities. CONTRACTOR shall provide all materials and equipment required for the testing and start-up. CONTRACTOR shall coordinate with the manufacturer's representative to test and adjust equipment prior to the official witnessed start-up to ensure the system is ready.
- D. Complete electrical and hydraulic pump down tests shall be performed by the factory trained manufacturer's representative and shall be witnessed by the ENGINEER. Testing performed upon each pump shall include the following inspections:
  - 1. Impeller, motor rating and electrical connections shall be checked for compliance with this specification.
  - 2. Prior to submergence, each pump shall be run dry to establish correct rotation.
  - 3. Each pump shall be run submerged in water.
  - 4. Motor and cable insulation shall be tested for moisture content or insulation defects.
- E. After the pumps have been completely installed and wired, the CONTRACTOR shall have the manufacturer's representative do the following:
  - 1. Megger stator and power cables.
  - 2. Check seal lubrication.
  - 3. Check for proper rotation.
  - 4. Check power supply voltage.

5. Measure motor operating load and no load current.
  6. Check level control operation and sequence.
- F. During this initial inspection, the manufacturer's service representative shall review recommended operation and maintenance procedures with the OWNER's personnel.
- G. Upon completion of the inspection, the manufacturer's representative shall certify to the ENGINEER that the installation is complete and in accordance with the specifications and all manufacturer's recommendations. A complete report certifying the results shall be prepared by the factory trained manufacturer's representative and submitted to the ENGINEER for approval. Any deficiencies in equipment and/or workmanship noted during the manufacturer's start-up shall be remedied by the CONTRACTOR prior to final inspection, at no additional cost to the OWNER.
- H. A copy of the completed, witnessed inspection reports and certification with cover letter certifying that all pumping and electrical equipment has been installed and is operating in accordance with manufacturer's requirements shall be submitted to the ENGINEER.
- I. One follow up training session shall be provided by the manufacturer's representative for the OWNER six months after substantial completion to review operation and maintenance.

**END OF SECTION 11300**