**Technical Specifications**

for

# CCC McGee Pump Station Relocation

**Morehead City, North Carolina**

Stroud Engineering Project #: PM3191~003

Owner
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Morehead City, NC 28557

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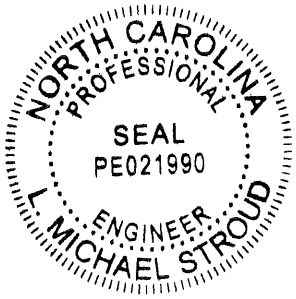


Signed by:
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L. Michael Stroud, PE 21990

11/24/2025

Date

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## SECTION 015000
## TEMPORARY FACILITIES AND CONTROLS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

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B. Waste removal facilities and services.

### 1.02 DEWATERING

A. Provide temporary means and methods for dewatering all temporary facilities and controls.

### 1.03 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

### 1.04 SECURITY - SEE SECTION 013553

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

B. Coordinate with Owner's security program.

### 1.05 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Remove trash from site periodically.

### PART 2 PRODUCTS - NOT USED

### PART 3 EXECUTION - NOT USED

**END OF SECTION**

**SECTION 033000**
**CAST-IN-PLACE CONCRETE**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Concrete formwork.

B. Joint devices associated with concrete work.

C. Concrete curing.

### 1.02 RELATED REQUIREMENTS

A. Section 079200 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.

### 1.03 REFERENCE STANDARDS

A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).

B. ACI PRC-211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide; 2022.

C. ACI PRC-302.1 - Guide to Concrete Floor and Slab Construction; 2015.

D. ACI PRC-304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).

E. ACI PRC-308 - Guide to External Curing of Concrete; 2016.

F. ACI SPEC-301 - Specifications for Concrete Construction; 2020.

G. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2024a.

H. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2024.

I. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.

J. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2024a.

K. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2024.

L. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2024.

M. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2025a.

N. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2020a.

O. ASTM C1116/C1116M - Standard Specification for Fiber-Reinforced Concrete; 2023.

P. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2022.

Q. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2024.

R. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).

### 1.04 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI SPEC-301 and ACI CODE-318.

## PART 2 PRODUCTS

### 2.01 FORMWORK

A. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.

### 2.02 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal Portland type.

B. Fine and Coarse Aggregates: ASTM C33/C33M.

C. Fly Ash: ASTM C618, Class C or F.

D. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

E. Structural Fiber Reinforcement: ASTM C1116/C1116M.

### 2.03 ADMIXTURES

A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

B. Air Entrainment Admixture: ASTM C260/C260M.

C. Accelerating Admixture: ASTM C494/C494M Type C.

### 2.04 ACCESSORY MATERIALS

A. Underslab Vapor Retarder:
   1. Sheet Material: ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. Single-ply polyethylene is prohibited.
   2. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
   3. Products:
      a. Henry, a Carlisle Company; Moistop Ultra 15: www.henry.com/#sle.
      b. ISI Building Products; Viper VaporCheck II 15-mil (Class A): www.isibp.com/#sle.
      c. W. R. Meadows, Inc; PERMINATOR Class A - 15 mils (0.38 mm): www.wrmeadows.com/#sle.

### 2.05 BONDING AND JOINTING PRODUCTS

A. Epoxy Bonding System:
   1. Complying with ASTM C881/C881M and of Type required for specific application.

B. Slab Isolation Joint Filler: 1/2-inch thick, height equal to slab thickness, with removable top section forming 1/2-inch deep sealant pocket after removal.

### 2.06 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI PRC-211.1 recommendations.

B. Admixtures: Add acceptable admixtures as recommended in ACI PRC-211.1 and at rates recommended or required by manufacturer.

C. Fiber Reinforcement: Add to mix at rate of 1.5 pounds per cubic yard, or as recommended by manufacturer for specific project conditions.

D. Normal Weight Concrete:
   1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 3,000 pounds per square inch.
   2. Fly Ash Content: Maximum 25 percent of cementitious materials by weight.
   3. Water-Cement Ratio: Maximum 40 percent by weight.
   4. Total Air Content: 5 percent, determined in accordance with ASTM C173/C173M.
   5. Maximum Slump: 4 inches.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

### 3.02 PREPARATION

A. Formwork: Comply with requirements of ACI SPEC-301. Design and fabricate forms to support all applied loads until concrete is cured and for easy removal without damage to concrete.

B. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.
   1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.

C. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Comply with ASTM E1643. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.

### 3.03 PLACING CONCRETE

A. Place concrete in accordance with ACI PRC-304.

B. Place concrete for floor slabs in accordance with ACI PRC-302.1.

C. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

### 3.04 SLAB JOINTING

A. Locate joints as indicated on drawings.

B. Anchor joint fillers and devices to prevent movement during concrete placement.

C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.

D. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab.

### 3.05 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. Maximum Variation of Surface Flatness:
   1. Exposed Concrete Floors: 1/4 inch in 10 feet.
   2. Under Seamless Resilient Flooring: 1/4 inch in 10 feet.
   3. Under Carpeting: 1/4 inch in 10 feet.

B. Correct the slab surface if tolerances are less than specified.

C. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

### 3.06 CONCRETE FINISHING

A. Concrete Slabs: Finish to requirements of ACI PRC-302.1 and as follows:
   1. Other Surfaces to Be Left Exposed: Trowel as described in ACI PRC-302.1, minimizing burnish marks and other appearance defects.

### 3.07 CURING AND PROTECTION

A. Comply with requirements of ACI PRC-308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. Surfaces Not in Contact with Forms:

1. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
2. Final Curing: Begin after initial curing but before surface is dry.

**3.08 PROTECTION**

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

**END OF SECTION**

## SECTION 221005
## PLUMBING PIPING

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Sanitary waste piping, buried beyond 5 feet of building.

B. Sanitary waste piping, buried within 5 feet of building.

### 1.02 REFERENCE STANDARDS

A. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2020 (Reapproved 2024).

B. ASTM D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings; 2025.

C. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets; 2020 (Reapproved 2024).

D. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2024, with Editorial Revision (2025).

### 1.03 QUALITY ASSURANCE

A. Perform work in accordance with 2018 NC Plumbing Code.

### PART 2 PRODUCTS

### 2.01 GENERAL REQUIREMENTS

### 2.02 SANITARY WASTE PIPING, BURIED BEYOND 5 FEET OF BUILDING

A. PVC Pipe: ASTM D2665 or ASTM D3034.
   1. Fittings: PVC.
   2. Joints: Solvent welded, with ASTM D2564 solvent cement.

### 2.03 SANITARY WASTE PIPING, BURIED WITHIN 5 FEET OF BUILDING

A. PVC Pipe: ASTM D2665 or ASTM D3034.
   1. Fittings: PVC.
   2. Joints: Solvent welded, with ASTM D2564 solvent cement.

### PART 3 EXECUTION

### 3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.

**END OF SECTION**

## SECTION 260505
## SELECTIVE DEMOLITION FOR ELECTRICAL

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Electrical demolition.

### PART 3 EXECUTION

### 2.01 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Remove, relocate, and extend existing installations to accommodate new construction.

B. Remove abandoned wiring to source of supply.

**END OF SECTION**

## SECTION 260519
## LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Single conductor building wire.

B. Wiring connectors.

C. Wire pulling lubricant.

### 1.02 REFERENCE STANDARDS

A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013 (Reapproved 2024).

B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2023.

C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010, with Editorial Revision (2020).

D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2020).

E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

F. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; 2021.

G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

H. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.

I. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.

J. UL 267 - Outline of Investigation for Wire-Pulling Compounds; Current Edition, Including All Revisions.

K. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.

L. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.

### 1.03 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

### PART 2 PRODUCTS

### 2.01 CONDUCTOR AND CABLE APPLICATIONS

A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.

B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.

### 2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

A. Provide products that comply with requirements of NFPA 70.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.

D. Comply with NEMA WC 70.

E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.

F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.

G. Conductor Material:

1. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
2. Tinned Copper Conductors: Comply with ASTM B33.

H. Conductor Color Coding:
1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
2. Color Coding Method: Integrally colored insulation.
3. Color Code:
a. 480Y/277 V, 3 Phase, 4 Wire System:
1) Phase A: Brown.
2) Phase B: Orange.
3) Phase C: Yellow.
4) Neutral/Grounded: Gray.
b. 208Y/120 V, 3 Phase, 4 Wire System:
1) Phase A: Black.
2) Phase B: Red.
3) Phase C: Blue.
4) Neutral/Grounded: White.
c. Equipment Ground, All Systems: Green.

## 2.03 SINGLE CONDUCTOR BUILDING WIRE

A. Description: Single conductor insulated wire.

B. Conductor Stranding:
1. Feeders and Branch Circuits:
a. Size 10 AWG and Smaller: Solid.
b. Size 8 AWG and Larger: Stranded.

C. Insulation Voltage Rating: 600 V.

D. Insulation:
1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.

## 2.04 WIRING CONNECTORS

A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

## 2.05 ACCESSORIES

A. Wire Pulling Lubricant:
1. Listed and labeled as complying with UL 267.
2. Suitable for use with conductors/cables and associated insulation/jackets to be installed.
3. Suitable for use at installation temperature.

# PART 3 EXECUTION

## 3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Installation in Raceway:
1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
2. Pull all conductors and cables together into raceway at same time.
3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.

4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

D. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.

E. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

F. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.

G. Make wiring connections using specified wiring connectors.
   1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
   2. Do not remove conductor strands to facilitate insertion into connector.
   3. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.

H. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

**END OF SECTION**

## SECTION 260526
## GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Grounding and bonding requirements.

B. Conductors for grounding and bonding.

C. Connectors for grounding and bonding.

### 1.02 RELATED REQUIREMENTS

A. Section 260519 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.

B. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

### 1.03 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

C. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

### 1.04 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

### PART 2 PRODUCTS

### 2.01 GROUNDING AND BONDING REQUIREMENTS

A. Do not use products for applications other than as permitted by NFPA 70 and product listing.

B. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.

C. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

D. Bonding and Equipment Grounding:
   1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
   2. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
   3. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
   4. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.

### 2.02 GROUNDING AND BONDING COMPONENTS

A. General Requirements:
   1. Provide products listed, classified, and labeled as suitable for the purpose intended.
   2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 260526:
   1. Use insulated copper conductors unless otherwise indicated.
      a. Exceptions:

1) Use bare copper conductors where installed underground in direct contact with earth.
2) Use bare copper conductors where directly encased in concrete (not in raceway).

C. Connectors for Grounding and Bonding:
1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
2. Unless otherwise indicated, use compression connectors for underground, concealed and other inaccessible connections.
3. Unless otherwise indicated, use mechanical connectors or compression connectors for accessible connections.

## PART 3 EXECUTION

### 3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Make grounding and bonding connections using specified connectors.
1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

D. Identify grounding and bonding system components in accordance with Section 260553.

**END OF SECTION**

**SECTION 260533.13**
**CONDUIT FOR ELECTRICAL SYSTEMS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Galvanized steel rigid metal conduit (RMC).

B. Galvanized steel electrical metallic tubing (EMT).

C. Rigid polyvinyl chloride (PVC) conduit.

### 1.02 RELATED REQUIREMENTS

A. Section 260526 - Grounding and Bonding for Electrical Systems.

B. Section 260529 - Hangers and Supports for Electrical Systems.

### 1.03 REFERENCE STANDARDS

A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2020.

B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S); 2020.

C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

D. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); 2020.

E. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC); 2025.

F. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.

G. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; 2020.

H. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; 2021.

I. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

J. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.

K. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.

L. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.

M. UL 797 - Electrical Metallic Tubing-Steel; Current Edition, Including All Revisions.

## PART 2 PRODUCTS

### 2.01 CONDUIT APPLICATIONS

A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70, manufacturer's instructions, and product listing.

B. Unless otherwise indicated and where not otherwise restricted, use conduit types indicated for specified applications. Where more than one listed application applies, comply with most restrictive requirements. Where conduit type for particular application is not specified, use galvanized steel rigid metal conduit.

C. Underground:
   1. Under Slab on Grade: Use rigid PVC conduit.
   2. Exterior, Direct-Buried: Use rigid PVC conduit.

D. Exposed, Interior, Not Subject to Physical Damage: Use galvanized steel rigid metal conduit (RMC) or galvanized steel electrical metallic tubing (EMT).

E. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit (RMC).
   1. Locations subject to physical damage include, but are not limited to:

a. Where exposed below 8 feet, except within electrical and communication rooms or closets.

## 2.02 CONDUIT - GENERAL REQUIREMENTS

A. Comply with NFPA 70.

B. Provide conduit, fittings, supports, and accessories required for complete raceway system.

C. Provide products listed, classified, and labeled as suitable for purpose intended.

D. Minimum Conduit Size, Unless Otherwise Indicated:
   1. Underground, Exterior: 1-inch trade size.

E. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

## 2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.

B. Fittings:
   1. Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 6.
   2. Material: Use steel or malleable iron.
   3. Connectors and Couplings: Use threaded type fittings only. Threadless fittings, including set screw and compression/gland types, are not permitted.

## 2.04 GALVANIZED STEEL ELECTRICAL METALLIC TUBING (EMT)

A. Description: NFPA 70, Type EMT galvanized steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

B. Fittings:
   1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel or malleable iron.
   3. Connectors and Couplings: Use compression/gland or set-screw type.
      a. Do not use indenter type connectors and couplings.

## 2.05 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

A. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 80 unless otherwise indicated; rated for use with conductors rated 90 degrees C.

B. Fittings:
   1. Manufacturer: Same as manufacturer of conduit to be connected.
   2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

# PART 3 EXECUTION

## 3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install conduit in accordance with NECA 1.

C. Galvanized Steel Rigid Metal Conduit (RMC): Install in accordance with NECA 101.

D. Rigid Polyvinyl Chloride (PVC) Conduit: Install in accordance with NECA 111.

E. Conduit Support:
   1. Secure and support conduits in accordance with NFPA 70 using suitable supports and methods approved by authorities having jurisdiction.
   2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.

F. Connections and Terminations:
   1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
   2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
   3. Use suitable adapters where required to transition from one type of conduit to another.
   4. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
   5. Provide insulating bushings, insulated throats, or listed metal fittings with smooth, rounded edges at conduit terminations to protect conductors.
   6. Secure joints and connections to provide mechanical strength and electrical continuity.

G. Penetrations:
   1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Engineer.
   2. Make penetrations perpendicular to surfaces unless otherwise indicated.
   3. Conceal bends for conduit risers emerging above ground.

H. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
   1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
   2. Where calculated in accordance with NFPA 70 for rigid polyvinyl chloride (PVC) conduit installed above ground to compensate for thermal expansion and contraction.
   3. Where conduits are subject to earth movement by settlement or frost.

I. Conduit Sealing:
   1. Use duct seal to prevent entry of moisture and gases. This includes, but is not limited to:
      a. Where conduits enter building from outside.
      b. Where conduits enter building from underground.
      c. Where conduits enter electrical panel from underground.

J. Provide grounding and bonding; see Section 260526.

**END OF SECTION**

## SECTION 262816.16
## ENCLOSED SWITCHES

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Enclosed safety switches.

### 1.02 RELATED REQUIREMENTS

A. Section 260526 - Grounding and Bonding for Electrical Systems.

B. Section 260529 - Hangers and Supports for Electrical Systems.

### 1.03 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

B. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.

C. NEMA BS 31047 - Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum); 2013 (Reaffirmed 2023).

D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

E. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

F. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

G. UL 98 - Enclosed and Dead-Front Switches; Current Edition, Including All Revisions.

### 1.04 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

### PART 2 PRODUCTS

### 2.01 ENCLOSED SAFETY SWITCHES

A. Description: Quick-make, quick-break enclosed safety switches listed and labeled as complying with UL 98; heavy duty; ratings, configurations, and features as indicated on the drawings.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
   1. Altitude: Less than 6,600 feet.
   2. Ambient Temperature: Between -22 degrees F and 104 degrees F.

D. Horsepower Rating: Suitable for connected load.

E. Voltage Rating: Suitable for circuit voltage.

F. Provide with switch blade contact position that is visible when the cover is open.

G. Conductor Terminations: Suitable for use with the conductors to be installed.

H. Provide solidly bonded equipment ground bus in each enclosed safety switch, with a suitable lug for terminating each equipment grounding conductor.

I. Enclosures: Comply with NEMA EN 10250, and list and label as complying with UL 50 and UL 50E.
   1. Environment Type per NEMA EN 10250: Unless otherwise indicated, as specified for the following installation locations:
      a. Outdoor Locations: Type 4X, stainless steel.

J. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.

K. Heavy Duty Switches:
   1. Comply with NEMA BS 31047.
   2. Conductor Terminations:
      a. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
   3. Provide externally operable handle with means for locking in the OFF position, capable of accepting three padlocks.

## PART 3 EXECUTION

### 3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Provide required support and attachment in accordance with Section 260529.

E. Install enclosed switches plumb.

F. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed switches such that the highest position of the operating handle does not exceed 79 inches above the floor or working platform.

G. Provide grounding and bonding in accordance with Section 260526.

**END OF SECTION**

**SECTION 266000**
**REMOTE MONITORING SYSTEM**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Remote Monitoring System.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Sensaphone Remote Monitoring Solutions; Sensaphone Sentinel Monitoring System with Cellular Modem: www.sensaphone.com.

B. Omnisite: www.omnisite.com.

C. Equal.

### 2.02 GENERAL

A. The system shall be a self-contained microprocessor controlled environmental monitoring system capable of monitoring up to 8 alarm channels (zones). The system shall be configured for operation by the user by means of a website and/or the Sensaphone mobile App for Android and IOS. Characteristics of the Input and Output Zones include 8 Universal Inputs and 1 Relay Output. Upon detection of any alarm or status change, the system shall commence the alarm notification process which includes dialing telephone numbers from a list associated with the particular alarm condition(s), and delivering a voice message identifying and describing the alarm condition(s) as well as sending text messages, and email notifications describing details of the alarm and its location. The system shall contain two rechargeable battery systems to maintain full operation of the device for up to 8 hours in the event of a power failure. The system shall contain a 4G/LTE cellular modem with options for either AT&T or Verizon cellular service for connection to the server system.The system shall utilize encrypted data transmission for secure communications. The system shall comply with Part 15 of the FCC rules for radiated and conducted emissions as well as the Canadian Interference Standard (ICES-003) for information technology equipment (ITE). The system shall have a two year warranty from the manufacturer.

### 2.03 I/O CHANNEL ATTRIBUTES AND FEATURES

A. Inputs
   1. The system shall come standard with a minimum of 8 universal input channels. All input channels shall be user-configurable as:
      a. NO or NC digital dry contact, using internal 3.3V source voltage.
      b. 4–20mA analog, using custom look-up table.
      c. NO or NC Pulse Count with configurable multiplier.
      d. NO or NC Run-Time Accumulator.
   2. The system shall have the following additional monitoring features:
      a. Built-in AC power failure detection.
      b. Low battery detectio.
      c. Device Offline detection.
   3. All monitored channels, including built-in monitoring features, shall allow configurable programming of pertinent operational data including, but not limited to:
      a. Zone Name
      b. Zone Type (NO/NC, 2.8K/10K thermistor, 4-20mA, pulse count, run-time accumulator)
      c. Zone Calibration
      d. High and Low Alarm Limits (-2,000,000 to 2,000,000)
      e. Alarm Recognition Time (0 seconds to 8 hours)
      f. Alarm Hold Time (1 second to 60 minutes)
      g. Alarm Reset Time (1 minute to 8 hours)

h. Alarm on Return-to-Normal
i. Alarm Delivery Contact List (Phone numbers, text numbers, email addresses, etc… ) for each zone
j. Alarm Delivery Enable/Disable for each channel to send notifications for alarms
k. Zone Enable/Disable

B. Output
1. The system shall have one built-in SPST 1A 30VDC/VAC relay output. The output may be programmed to switch either manual□ly (via the website or App) or automatically using one of the following modes:
a. Activate or Deactivate as soon as one or more selected zones exceeds the alarm limits (regardless of recognition time). Reverts when the alarm condition no longer exists.
2. Activate or Deactivate when one or more selected zones becomes an alarm (recognition time enforced). Reverts when the alarm condition no longer exists.
3. Activate or Deactivate while one or more selected zones has an unacknowledged alarm. Reverts once the alarm is acknowledged.
4. Activate when a selected zone is either greater than, less than, or equal to a user configurable value and Deactivate when a selected zone is either greater than, less than, or equal to a user configurable value.

**2.04 CELLULAR COMMUNICATIONS**

A. The System shall contain a battery-backed 4G/LTE cellular modem with an external antenna for communication to the website server system. The system shall be configured to operate with either AT&T or Verizon cellular service at the time of order. The System shall require a continuous cellular connection in order to operate. The System shall require a cellular subscription plan with manufacturer to operate. LED indicators on the unit shall be provided to indicate when the unit is online with the website server system.

**2.05 PROGRAMMING**

A. The System shall be fully programmable through the website. A mobile App for Android and IOS shall be provided to permit live system status as well as limited programmability.

**2.06 ALARM NOTIFICATION**

A. The system shall send alarm notification messages via email, text message and/or voice telephone call with a paid cellular subscription. Alarm messages will be delivered in English. Alarm messages sent via telephone shall be delivered in digitized human voice using text-to-speech technology. The system will continue to call telephone numbers and send text and email messages in succession until a positive acknowledgment of the alarm message is received. Acknowledgment is accomplished by entering a numeric code from the called telephone, or by replying to a text or email message, or by logging-in to the website or App and requesting acknowledgement. The alarm may also be acknowledged by pressing the ‘Acknowledge’ button on the Sentinel device itself. The system will call each programmed telephone number up to 4 times. Once the alarm is acknowledged the system shall halt the dialing process. The system shall allow for an unlimited number of users with an unlimited number of contact methods per user. The system shall allow for tiered alarm delivery schedules so that a time delay may be inserted between tiers.

**2.07 DEVICE SUPERVISION**

A. The device shall be supervised by the website server system. If a device stops communicating with the server for a specified period of time the system will notify selected users of the problem. When the device resumes communication with the server an optional ‘return-to-normal’ message will be sent.

**2.08 DATA LOGS**

A. The system shall allow monitored zone values to be periodically stored in system memory at a programmable interval from 1 minute to 24 hours. Stored values shall be uploaded to the

Sensaphone.net server system on a periodic basis (approximately once per hour) for permanent storage. Users shall have the capability of querying logged data values from the Sensaphone.net website and downloading the displayed data. The device shall be capable of storing up to 130,000 data points (or up to 6.5 days logging all zones at the minimum interval) in internal memory.

**2.09 ALARM HISTORY LOGS**

A. The website server system shall maintain a log of all alarm events. The system shall also maintain a log of all alarm notifications including the users name, type of delivery (email, phone, text), and telephone number/email address.

**2.10 SYSTEM FEATURES**

A. Power
   1. The system shall be provided with a UL/CSA listed 12VDC power transformer with USA style blades that the user may plug into a 100-240VAC outlet, 50/60HZ. The system shall monitor for the presence of primary 12VDC power and shall be capable of generating an alarm if main power should fail. The system shall also contain a power management controller to distribute power to the Sentinel, modem, and battery backup system. The controller shall maintain the proper charge level to the modem backup battery.

B. Battery Backup
   1. The system shall have two rechargeable battery systems. A nickel-metal-hydride battery pack shall be included within the enclosure. This battery shall provide up to 8 hours of continuous operation of the Sentinel in the absence of AC power. (Actual battery backup performance is dependent upon the age of the battery, the ambient temperature, and the charge condition). The Sentinel shall also contain a long-life lithium battery (type CR2) to maintain the system clock, as well as certain dynamic zone values such as pulse count, runtime, and min/max values. The lithium battery shall last 4 years or more depending on use. A 12V 3AH SLA rechargeable battery shall be included to provide backup power to the cellular modem. The 12V SLA battery shall provide up to 8 hours of continuous operation of the modem in the absence of AC power. (Actual battery backup performance is dependent upon the age of the battery, the ambient temperature, and the charge condition).

C. Visual Indicators
   1. Each zone input shall have a corresponding LED that will indicate the alarm and acknowledgment status of each zone. The system shall also have a ‘Power’ led to indicate if the device is powered on. An ‘Online’ LED shall be included to indicate if the device is online with the Sensaphone.net server system. A ‘Standby’ LED shall be included to indicate if the device is operating in Standby mode.

D. Standby
   1. The system shall be capable of operating in Standby mode. In Standby mode any detected alarms will be ignored, however, monitored values will continue to be displayed on the website and on the mobile Apps. The data logger will continue to store values while in Standby mode. Standby mode can be configured to run for a preconfigured time period in which case it will return to normal mode automatically, or it may operate in ‘untimed’ mode in which case it must manually be returned to normal mode.Users can enter or exit Standby mode through the website, the mobile App, or using the Standby button on the front panel of the device.

**2.11 ENCLOSURE AND ENVIRONMENTAL**

A. Enclosure
   1. The SCD-1200-4GxxCD shall be housed in a NEMA 4X/IP66 polycarbonate enclosure with a clear cover.

B. Electrical Protection
   1. The Power input shall be protected against voltage surges with a metal oxide varistor. The Ethernet port shall be protected against voltage transients with low capacitance transient

suppressors. The zone inputs shall be protected against voltage surges using metal oxide varistors and low-voltage diode clamping circuits.

C. Environmental
   1. The system shall function over an operating range of 32°F to 122°F (0° to 50° C) at up to 0–90% RH, non-condensing. The sys□tem may be stored over the temperature range of 32° to 140°F (0° to 60° C).

D. Maintenance
   1. The system manufacturer shall have in-house service facilities and technical assistance available during normal business hours, Monday–Friday, 8AM–5PM(EDT/EST).

## PART 3 EXECUTION

### 3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

### 3.02 SYSTEM STARTUP

A. Prepare and start equipment and systems in accordance with manufacturers' instructions and recommendations.

## SECTION 333123
## SANITARY SEWERAGE FORCE MAIN PIPING

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Sanitary sewerage force main piping, fittings, and accessories.

B. Connection of facility sanitary force main system to municipal sewer.

### 1.02 REFERENCE STANDARDS

A. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120; 2021a.

B. ASTM D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series); 2025a.

C. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2020 (Reapproved 2024).

### PART 2 PRODUCTS

### 2.01 FORCE MAIN PIPE MATERIALS

A. Provide products that comply with applicable code(s).

B. PVC Pipe:
   1. PVC Pipe and Fittings: ASTM D1785, Schedule 80 solvent weld joints.
   2. Joints:
      a. Solvent Cement: ASTM D2564.

C. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.

### PART 3 EXECUTION

### 3.01 INSTALLATION - PIPE

A. Install pipe, fittings, and accessories at the locations indicated on layout drawings and in accordance with manufacturer's instructions. Seal watertight.

B. Connect to building sanitary sewer outlet.

### 3.02 JOINTING

A. PVC Pipe:
   1. Solvent-Weld Joints: Comply with manufacturer's instructions.

**END OF SECTION**

## SECTION 333213
## PACKAGED WASTEWATER PUMPING STATIONS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Pre-engineered, prefabricated assemblies comprising pump(s), valve(s), internal piping, and controls.

B. Wet well construction.

### 1.02 RELATED REQUIREMENTS

A. Section 333123 - Sanitary Sewerage Force Main Piping: Connections to sanitary sewerage force main piping system.

### 1.03 REFERENCE STANDARDS

A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

### 1.04 WARRANTY

A. Warranty: Provide manufacturer's warranty for packaged pump station as itemized below.
   1. Pumps: 3 year.
   2. Pump Control Panel: 5 year.
   3. Remainder of System: 1 year.

B. Provide operation and maintenance procedures that are required to keep warranty valid.

### PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Packaged Wastewater Pumping Station:
   1. Zoeller Pump Company: www.zoellerpumps.com.
   2. Liberty Pump: www.libertypumps.com.
   3. Goulds Water Technology: www.xylem.com.
   4. Equal.

### 2.02 PACKAGED WASTEWATER PUMPING STATIONS, GENERAL

A. Packaged Wastewater Pumping Stations: Pre-engineered duplex sewage pump station, including wet well/pump chamber construction, access way(s), valves, internal piping, internal wiring, controls, and other necessary components for continuous, unattended, automatic operation.
   1. Furnish all components factory-assembled to greatest extent possible; where field installation is required, provide piping, wiring, and other components as required for a complete installation.
   2. Configuration: Wet well and access way, with pump(s) submerged in wet well, surface hatch; no above grade components.
   3. Service Life: 15 years.
   4. Finish all components in accordance with manufacturer's standard practice for sewage resistance.

B. Dimensions:
   1. Wet Well Inside Diameter: 36 inches, minimum.
   2. Inlet and discharge sizes and elevations as indicated on drawings.

C. Pump Lifting Assembly: Factory-assembled, mounted in wet well, designed to allow each pump to be independently raised to ground level for maintenance and returned to position without entering wet well; vertical rails, pump support assembly sliding on rails, integral guide bracket on pump, pump quick disconnect with hydraulic sealing flange, discharge pipe supports, and lifting chain; all metal parts stainless steel or bronze.

D. Anchors and Fasteners: Stainless steel.

E. Identification: For each item of equipment, provide the manufacturer's name or trademark and model number on corrosion-resistant identification plate, cast integrally, stamped, or otherwise permanently marked in conspicuous place; for pumps, include pump capacity in gallons per second and liters per minute, pump head in feet and meters, speed of rotation, and direction of rotation.

**2.03 PUMPS**

A. Manufacturer:
   1. Zoeller Pump Company; Model G840-E: www.zoellerpumps.com.
   2. Liberty Pump: www.libertypumps.com.
   3. Goulds Water Technology: www.xylem.com.
   4. Equal.

B. Sewage Grinder Pumps: Non-clogging submersible centrifugal pump capable of grinding all materials found in normal domestic sewage including plastics, rubber, sanitary napkins, disposable diapers, and wooden articles, into finely ground slurry with particle dimensions no greater than 1/4 inch.
   1. Capable of operating in partially submerged condition.
   2. Rated Capacity: As indicated on plans.

**2.04 WET WELL CONSTRUCTION**

A. Construction: Fiberglass construction.

B. Fiberglass Construction: Fiberglass reinforced polyester resin of shape and design to withstand soil and external hydrostatic pressures.

C. Access Hatch Covers: Fiberglass.

**2.05 VALVES AND PIPING**

A. Valves: Provide one ball valve and one check valve on each pump discharge line.

**2.06 PIPING**

A. Internal Piping: PVC as specified in Section 333123.
   1. Manufacturer's standard jointing system.
   2. Fittings of pressure rating not less than that of pipe.

B. Accessories: Provide fittings, flanges, connecting pieces, transition glands, transition sleeves, and other adapters as required.

**2.07 CONTROL FUNCTIONS AND INSTRUMENTATION**

A. Automatic Controls: Provide automatic controls for pump and other equipment operation, with local manual controls.

B. Pump Controls: Provide controls capable of operating pumps either simultaneously or individually, depending on load conditions.
   1. Pump Actuators: Two float-operated water level switches, one float set at low-water level and one at high-water level.
   2. When low-water level is exceeded, start the Lead pump.
   3. Each time low-water level is reached, set the other pump as Lead.
   4. Operate both pumps if water level rises above high-water level.
   5. Prevent both pumps from starting at the same time.
   6. Stop both pumps when low-water level is reached.
   7. Provide Hand-Off-Auto switches for each pump.
   8. If one pump is disabled, switch operation to other pump.
   9. Include alarm to warn of failure of pumps.

C. High Level Alarm:
   1. When high water level is reach, actuate alarm circuit.
   2. Alarm circuit shall actuate on high water level only.

## 2.08 POWER

A. Electrical Power Available: As indicated on drawings.

B. Wiring and Conduit: Meet or exceed requirements of NFPA 70.

C. Control Wiring: 18 AWG, minimum, in plastic wireway with snap-on cover, bundled and tie wrapped neatly.

D. Control Panel: NEMA 4X, construction, with hinged door and hinged dead front; sized to accommodate all components; factory wired and tested.
   1. Internal Wiring: Stranded copper conductors rated at 194 degrees F, with conductor terminations as recommended by device manufacturer.
   2. Mounting: Wall mounted, suitable for mounting on strut or channel.
   3. Door: Minimum 180 degrees opening, rubber gasket weatherproof seal, 3-point latch, and padlockable handle.
   4. Back Plate: Steel sheet, 12 gauge, 0.1046 inch thick, minimum; finished with primer coat and two coats of baked on white enamel.
   5. Hardware Mounting: Use machine screws in thread-tapped holes; sheet metal screws not permitted.

E. Circuit Breakers: Indicating type, quick-make quick-break thermal magnetic breakers; operating handle with On-Trip-Off positions, with Trip in middle position; inverse time characteristics through use of bimetallic tripping elements supplemented by magnetic trip for instantaneous protection; overload on one pole automatically trips and opens all legs; field installed handle ties not permitted.

F. Motor Starters: Open frame, across the line, full voltage, IEC or NEMA rated with individual overload protection for each phase.

G. Motor Overload Protection: Melting alloy type thermal overload relays; interchangeable and sized in accordance with NFPA 70.

H. Control Transformers: Fused transformers and grounded secondaries.

I. Alarm Indicators: Alarm light and horn mounted on exterior of power enclosure.
   1. Light: Weatherproof and shatterproof red strobe alarm light fixture.
   2. Horn: Not less than 90 dB at 10 feet.
   3. Controls: Manual alarm silence switch that deactivates horn but leaves light flashing until alarm condition ceases to exist; when alarm condition ceases to exist reset alarm function for normal operation.
   4. Remote Monitoring and Alarm Indication: Provide one normally open and one normally closed unpowered contacts for remote monitoring and alarm indication, wired to terminal strip.

## 2.09 SOURCE QUALITY CONTROL

A. Test pump, valve, and piping assembly in factory prior to shipping, at test pressure equal to 50 percent more than pump discharge pressure or total dynamic head, whichever is greater.

# PART 3 EXECUTION

## 3.01 INSTALLATION

A. Install as indicated, in accordance with drawings and manufacturer's instructions.

B. Set water level controls at elevations indicated on plans.

**END OF SECTION**