PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 26 29 01 - Contactors.

1.2 REFERENCES

.1 CSA International
  .1 CSA C22.2 No.14-13, Industrial Control Equipment.

.2 National Electrical Manufacturers Association (NEMA)
  .1 NEMA ICS 1-2000(R2008), Industrial Control and Systems: General Requirements.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:
  .1 Submit manufacturer's instructions, printed product literature and data sheets for control devices and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:
  .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Newfoundland and Labrador, Canada.
  .2 Include schematic, wiring, interconnection diagrams.

1.4 QUALITY ASSURANCE

.1 Conduct tests in accordance with Section 26 05 00 - Common Work Results for Electrical.

1.5 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for control devices for incorporation into manual.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:
- .1 Store materials off ground indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect control devices from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

.4 Packaging Waste Management: remove for reuse and return of packaging materials as specified in Construction Waste Management Plan Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/ Demolition Waste Management and Disposal.

1.7 LEED 2009 REQUIREMENTS

.1 LEED Documentation:
- .1 Submit Material Safety Data Sheets (MSDS) or product data sheets, for all site applied interior paints, coatings, adhesives, sealants, sealant primers, concrete curing compounds, etc. to ensure compliance with LEED Requirements for low emitting materials as per Section 01 35 21.

PART 2 - PRODUCTS

2.1 AC CONTROL RELAYS

.1 Control Relays: to CSA C22.2 No.14 and NEMA ICS 1.

.2 Universal pole type: electrically held with 4 poles, convertible from NO to NC by changing wiring connections. Coil rating: 120 V, 5 VA. Contact rating: 120 V, 5 A.

2.2 RELAY ACCESSORIES

.1 Standard contact cartridges: normally-open - convertible to normally-closed in field.

2.3 OPERATOR CONTROL STATIONS

.1 Enclosure: to provide a degree of environmental protection equal to or higher than CSA Type 1 for indoor and 4X for outdoor, surface mounting; unless noted otherwise.

2.4 PUSHBUTTONS

.1 Heavy duty oil tight. Operator flush type. Black or Green, with 1-NO and 1-NC contacts rated at 120 V, 5 A, AC, labels as indicated. Stop pushbuttons coloured red, labelled "stop".

2.5 SELECTOR SWITCHES

.1 Maintained 2 and 3 position labelled as indicated heavy duty oil tight, operators knob, contact arrangement as indicated, rated 120 V, 5 A AC.

2.6 INDICATING LIGHTS

.1 Heavy duty oil tight, full voltage, LED type, push-to-test, lens colour: as indicated, supply voltage: 120 V AC, lamp voltage: 120 V AC, labels as indicated.

2.7 CONTROL AND RELAY PANELS

.1 Panel to provide a degree of environmental protection equal to or higher than CSA Type 1 for indoor and 4X for outdoor, sheet steel enclosure with hinged padlockable access door, accommodating relays, timers, labels, as indicated, factory installed and wired to identified terminals.

2.8 CONTROL CIRCUIT TRANSFORMERS

.1 Single phase, dry type.

.2 Primary: 600 V, 60 Hz ac.

.3 Secondary: 120 V AC.

.4 Rating: 250 VA, unless noted otherwise.

.5 Secondary fuse: 3 A, unless noted otherwise.

.6 Close voltage regulation as required by magnet coils and solenoid valves.

2.9 THERMOSTAT (LINE VOLTAGE)

.1 Wall mounted reverse acting thermostat.

.2 Full load rating: 8 A at 120 V AC.

.3 Temperature setting range: 5° to 30°C.

.4 Markings in 5 degrees increments.

2.10 FLOAT SWITCH ASSEMBLY

.1 Mechanical tilt float switch with one form `C' contact rated 5A (minimum) @ 120V. When the liquid level reaches the regulator, the casing will tilt and the mechanical switch will change status.

.2 Corrosion resistant float housing suitably weighted for use in sewage.

.3 Submersible cable: factory assembled to float switch, 3 conductor, flexible control cable with extra hard usage oil and water resistant jacket. Cable and cable connectors to be watertight and mechanically capable of supporting float switch. Cable length as required plus additional 3 meters.

.4 Float switch to be connected to sewage pump logic controller panel via barrier terminal located in the panel, to provide for intrinsically safe operation of the float switch in Class I, Zone 2, Gr. IIA and IIB, T3 environment.

.5 Mounting Bracket: 316 stainless steel or 316L stainless steel if welded connections are utilized, unless noted otherwise.

2.11 INTRINSICALLY SAFE RELAYS

.1 Intrinsically safe switch amplifier, rated Class I, Zone 2, Gr. IIA and IIB, T3 hazardous location.

.2 Digital input from float and limit switches.

.3 Output Form A (normally-open) contact, 5A, 120 Vac.

.4 The input circuit electrically isolated from the non-intrinsic safe circuits up to a peak voltage of 300 V.

2.12 HOUR METER

.1 Electronic tamperproof AC hour meter for recording pumps operating time.

.2 Electromechanical indicator to store accumulated hours, 6 digits display in format 99999,9 accuracy +/-0.02, operating voltage 120 V, front panel mounting.

2.13 GROUND FAULT PROTECTION

.1 Ground fault protection to measure the ground leakage current of an electrical installation and interrupt the power supply if the ground fault current exceeds set value.

.2 Solid state ground fault relay with characteristics:
- .1 Supply 120 V, 60 Hz.
- .2 Fault current detection: selectable in a range of 1 to 30 A.
- .3 Time delay: selectable in a range of instantaneous to 4.5 sec.
- .4 Auxiliary contacts as indicted, rated 5A 120 V.

.3 Sensor:
- .1 Compatible with ground fault relay.
- .2 Type: toroids, closed.
- .3 Voltage: 208 V.
- .4 Ratio: as required.
- .5 Short circuit withstand: 65 kA.

2.14 WARNING SIGNS

.1 Provide warning signs (where applicable) in accordance with Section 26 05 00 - Common Work Results - For Electrical.

2.15 LEED 2009 REQUIREMENTS

.1 All site applied interior paints, coatings, adhesives, sealants, sealant primers, concrete curing compounds, etc. to comply with LEED Requirements for low emitting materials as per Section 01 35 21 - LEED 2009 Requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for control devices installation in accordance with manufacturer's written instructions.
- .1 Visually inspect substrate in presence of Departmental Representative.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

.1 Install pushbutton stations, control and relay panels, control devices and interconnect as indicated.

.2 Seismic requirements: in accordance with Section 26 05 00 - Common Work Results - For Electrical.

3.3 FIELD QUALITY CONTROL

.1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.

.2 Depending upon magnitude and complexity, divide control system into convenient sections, energize one section at time and check out operation of section.

.3 Upon completion of sectional test, undertake group testing.

.4 Check out complete system for operational sequencing.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  .1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END