



# Addendum 1

March 20, 2020

## **Tender T20-11 Greenwood Trunk Sewers – Addendum No. 1**

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This addendum forms part of the Tender document and shall be read, interpreted, and coordinated with all other parts. The costs of all work contained herein shall be included in the submission. The following revisions supersede the information contained in the original documents to the extent referenced and shall become part thereof.

### **Item No. 1 – Tender Revisions**

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1. Delete SS 01 57 01 1.9.1.2 and replace with the following:

Avoid disturbing areas of pooled surface water in the event that they are utilized by amphibians. If these areas cannot be avoided, a Qualified Environmental Professional (QEP) appointed by the City will conduct a survey to determine if these areas are utilized by amphibians and determine a plan to avoid impacts.

2. Electrical Additions

Replace drawings E04, E05, and E07 dated February 18, 2020 with Revision 1 Drawings E04, E05 and E07 dated March 12, 2020 attached to this addendum.

Add electrical Drawings E09 to E20, dated March 12, 2020 attached to this addendum.

*\* for clarity the complete electrical drawing package including the above additions has been included in this addendum.*

3. Delete Section 26 27 15 – Electrical and Controls components and replace with the revised Section 26 27 15 attached to this addendum
4. Section SS 33 32 14 – Prefabricated Submersible Sewage Lift Stations

Add clause 2.1.1.12

.12 Lift station to have FRP top with safe hatch.

5. Section 33 42 13 – Pipe Culverts

Add clause 1.5.7

.7 The removal and disposal, or reinstatement of existing pipe culverts noted on the drawings shall be considered incidental to the project costs. Culverts are to be

removed from the site, and backfill for any removed culverts shall be as per trench backfill specification noted in the drawings and specifications.

6. Section 26 50 00 – Lighting

Add Section 2.6 as follows

2.6 AREA LIGHT FIXTURE

- .1 LED, 120V
- .2 Tenon-mounted on Type 2 Pole, location as indicated in Contract Drawings.
- .3 Power: 135W
- .4 Lumen Output: 10000
- .5 4000K colour temperature.
- .6 Include all necessary connectors.
- .7 Luminaire/Antenna Pole
  - .1 Steel poles: to CSA C22.2 No.206 and per BC MoTI specifications.
  - .2 Foundations to BC MoTI specifications.
  - .3 Pole shaft: BC MoTI Type 2
  - .4 Luminaire arm:
    - .1 Flange: BC MoTI Type 1 flange
    - .2 Arm: BC MoTI modified 2A Arm
  - .5 Finish: all materials and hardware shall be galvanized steel.

7. 1. Supplemental Instructions to Tenderers – Amendment of Tenders

Delete existing Amendment of Tenders 12.1 in its entirety.

Replace with: *Change “hand, email or fax” to “hand or email” and add “An amendment by fax will not be accepted”.*

**Item No. 2 – Questions and Clarifications**

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- 1. Attached is a list of attendees at the pre-tender site review that was held on March 12, 2010.
- 2. Clarification was requested on the spreading of peat and excess topsoil material on designated fields.

**The peat excavated from the subgrade the north end of the pond can be spread on the field**

to the north of the pond. Material must be spread on the field in lifts of no more than 0.3 m and to a maximum depth of 0.6 m. Material must be evenly distributed along the full width of the field.

3. Clarification was requested regarding requirements for removing or relocating stumps, debris, or vegetation and brambles such as blackberry bushes located within the alignment.

Stumps and debris within the alignment can be moved outside of the of the right of way to facilitate construction.

4. Clarification was requested regarding traffic requirements for work on the access road.

The farm access road is to be active throughout the project. The contractor may be able to limit access for durations of up to 3 days to facilitate work within the roadway through coordinating with the landowner.

5. Clarification was requested on whether a laydown area on private property outside of the designated Right of Way will be available.

The contractor may use areas beyond the designated ROW where required due to slopes or excavations. The landowner will also make available a section of land to use as a laydown area. After construction, any land disturbed by the contractor will need to be remediated to equal to or better conditions.

6. Clarification was requested regarding the removal of trees to facilitate sewer installation on the west end of the project.

For the purpose of pricing, tenderers to assume that trees impacting the design alignment can be removed as part of construction.

7. Please verify the Sanitary Sewer PVC SDR 35 – 250mm diameter length, SoQ bid item 33.03.

For the purposes of the tender, quantities are as noted in the SOQ. The contractor will be paid for actual length of sewer installed as per the contract terms.

8. Please verify the FM PVC Sani – 350mm diameter length, SoQ bid item 33.09

For the purposes of the tender, quantities are as noted in the SOQ. The contractor will be paid for actual length of sanitary forcemain installed as per the contract terms.

9. Please confirm the diameter for manholes as SoQ indicated manholes to be 1050mm diameter and the IFT Drawings indicate 1200mm diameter. Also please confirm the vertical depth of the risers.

Manholes SMH-2 to SMH-15 to be 1200 mm diameter as noted on the IFT Drawings. Items 33.25 and 33.26 should be priced based on the 1200 mm manholes required and not the 1050 mm noted.

For the purposes of the tender, the vertical depth of the risers is to be as noted in the SOQ. Contractor will be paid for actual quantity installed, with measurements made as per the measurement and payment clause noted in the Supplementary Specifications.

10. Please confirm where the payment for “Existing culvert to be removed” located on Civil DWG C03 will be included.

The existing culvert removal on DWG C03 will be incidental to the proposed culvert installations.

11. Please confirm the length of culvert pipe 400mm diameter, SoQ bid item 33.21.

For the purposes of the tender, quantities are as noted in the SOQ. The contractor will be paid for actual length of culverts installed as per the contract terms.

12. Please confirm where the payment for Cap end of 100 diameter PVC San FM on SMH-16 as shown on DWG C11, will be included.

The 100 mm diameter PVC San FM stub and cap on manhole SMH-16 is to be incidental to the manhole installation.

13. Please confirm the depth of the 1200 diameter Valve Chamber MH associated with the Lift Station.

Manhole depth can be determined based off the inverts of the forcemain and surface elevation of the lid. There should be minimum 0.5m separation between the invert of the pipe and floor of the manhole.

14. Please confirm the scaling for the detailed lift stations on DWGs C12 and C13.

The drawing set is scaled for full sized construction drawings (ANSI D sheet size), with dimensions of 22”x34”.

15. Hydraulic Seeding Spec 1.8.1 is not referenced in the supplementary specifications.

Hydraulic Seeding Measurement and Payment Clause is referenced in MMCD Section 32 92 19 Hydraulic Seeding.

16. Please confirm locations of Odour Control.

Odour Control is to be installed on manholes SMH-16 and SMH-17.

17. Confirmation was requested on whether there will be a payment item for dewatering.

Expected dewatering based on the site conditions and information provided in the geotechnical report is considered incidental to the works.

18. Please advise if an acceptable alternate for a generator will be considered.

We will not be reviewing or accepting approved equals as part of the tender process.

19. Please advise if there is a basis of design for the lamp standard or if the specifications are met from E03 would be sufficient.

See Section 26 50 00 addition above.

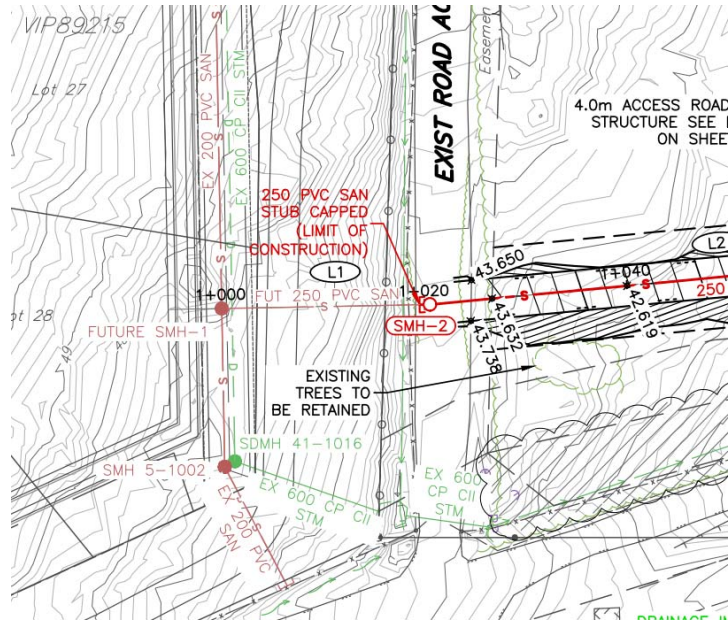
20. Please confirm if only 1 x each of the Cree basis of design lights are required in each of their locations.

There is only 1 luminaire pole and light required.

### **Item No. 3 – Additional Clarifications**

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1. Work will take place on an active farm. Livestock may be present on site, and as such excavations will need to be sufficiently protected outside of working hours.
2. Tenderers to assume existing tire and plastic piles, and existing structure adjacent to the ROW alignment will be removed prior to construction.
3. All excess trench excavation material is required to stay on the property. A location on the property will be made available by the landowner for disposal of excess trench excavation material.
4. Excess trench water from excavations may be pumped to the nearby fields with appropriate sediment control measures put in place. The location and sediment measure must be approved by the private land owner.
5. The limit of construction for the project is noted to be the 250 PVC Cap at station 1+019.511. The main shown as future and Future SMH 1 shown on the below sketch is not included in the works.



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**Acknowledgement of this Addendum as part of your submission is required.**

**End of Addendum No. 1**

**Bernd Guderjahn, SCMP  
Manager of Purchasing  
City of Courtenay**

## Greenwood Trunk Sewers – Pre-Tender Site Visit

March 12, 2020

### List of Attendees

#### **Attendees**

Graeme Sheperd  
Stewart Armstrong  
Daryl Henry  
Mike Stepaniuk  
Cole Bouddreau  
Carson Tipper  
Brad Maxwell  
Mark Stuart  
Nick Belanger  
Sean Hayes  
Chris Davidson  
Eric Sears  
Nolan deWitt

#### **Company**

Stellar Power & Control Solutions LP  
Copcan Civil Ltd.  
Don Mann Excavating Ltd.  
IWC Excavation Ltd.  
Wacor Holdings Ltd.  
Upland Contracting Ltd.  
Upland Contracting Ltd.  
Upland Contracting Ltd.  
Milestone Equipment Contracting Inc.  
City of Courtenay  
City of Courtenay  
Urban Systems Ltd.  
Urban Systems Ltd.

#### **Email**

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PBX Engineering Ltd.

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## **1. GENERAL**

### **1.1 DOCUMENTS**

- .1 This Section of the Specification forms a part of the Contract Documents and is to be read, coordinated and implemented in conjunction with all other parts.

### **1.2 RELATED SECTIONS**

- .1 Section 26 05 00 - Common Work Results for Electrical.
- .2 Section 26 05 10 - Testing and Commissioning
- .3 Section 26 05 21 - Wires and Cables (0-1000V)
- .4 Section 26 05 31 - Splitters, Junction, Pull Boxes and Cabinets

### **1.3 SHOP DRAWINGS AND PRODUCT DATA**

- .1 Submit shop drawings and product data accordance with Section 26 05 00 - Common Work Results - Electrical.

### **1.4 WASTE MANAGEMENT AND DISPOSAL**

- .1 In accordance with Section 26 05 00 – Common Work Results – Electrical.

### **1.5 CLOSEOUT SUBMITTALS**

- .1 Provide operation and maintenance data for all equipment for incorporation into manual specified in Section 26 05 00 - Common Work Results - Electrical.
- .2 Include data for each type and style of equipment.

## **2. PRODUCTS**

### **2.1 CONTROL ENCLOSURE**

- .1 Provide cabinet in accordance with Section 26 05 31 - Splitters, Junction, Pull Boxes and Cabinets.
- .2 A new Controls Enclosure shall be installed as indicated in the Drawings.



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- .3 Equipment layouts shown on the Contract Drawings represent approximate locations only, Contractor shall provide shop drawings for the Controls Enclosure including detailed equipment layouts and panel dimensions.

**2.2 CONTROLS ENCLOSURE ADDITIONAL COMPONENTS**

- .1 Selector switches:
  - .1 Panel mountable, two, three or four position, as required, 22mm.
  - .2 120VAC/24VAC/DC rated, as required.
  - .3 Bezel Material: Chromium Plated Metal
- .2 Indicators/Pilot Lights:
  - .1 Panel mountable, round, LED-based, 22mm, 120VAC/24VAC/DC rated, as required.
  - .2 Push to test.
  - .3 Bezel Material: Chromium Plated Metal
  - .4 Colour as indicated on drawings.
- .3 Push buttons:
  - .1 Panel mountable, 120VAC/24VAC/DC rated, as required, momentary contacts, normally open, 22mm.
  - .2 Bezel Material: Chromium Plated Metal
  - .3 Colour: Black
- .4 Pump Stop Pushbutton:
  - .1 Panel mountable, 120VAC/24VAC/DC rated, as required, turn to release, normally closed, 40mm.
  - .2 Bezel Material: Chromium Plated Metal
  - .3 Colour: Red mushroom type
- .5 Level Sensor Equipment:
  - .1 Mounting: Panel mount
  - .2 Voltage: 24VDC
  - .3 Measurement points: Dual point
  - .4 Output: 6 output relays
  - .5 Standard of Acceptance: Siemens Multiranger 200
- .6 Pump Protection Equipment (high temp and seal leak indication):
  - .1 Standard of Acceptance: Flygt MiniCAS II
- .7 HMI:

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- .1 Standard of Acceptance: Rockwell Automation PanelView Plus 10”.
- .8 Ethernet Bulkhead Receptacle:
  - .1 Application: Feed-thru coupler
  - .2 Mounting: Jam nut panel mount
  - .3 Connector: Female RJ45
  - .4 Rating: IP67-weatherproof with attached cap.
  - .5 Standard of Acceptance: Video Products Incorporated RJ45-6WTP-CS-JCK
- .9 Router:
  - .1 Standard of Acceptance: Sonicwall TZ300
    - .1 Ports: 5 Gigabit Ethernet RJ45 Ports
    - .2 Voltage: 120VAC
- .10 Telecommunications Modem:
  - .1 Supplied by owner for installation by contractor.
  - .2 Standard of Acceptance: Thomson Telecom SpeedTouch ST516v6
- .11 Network switch:
  - .1 Application: unmanaged industrial ethernet switch
  - .2 Ports: 8 10/100BaseTX RJ-45
    - .1 LED Link/Activity status indication
    - .2 Auto sense speed and flow control
  - .3 Power supply: 24VDC
  - .4 Mounting: horizontal DIN rail
  - .5 Configurable alarm contact
  - .6 Mean time between failure: minimum 1,000,000 hours
  - .7 Provide one (1) spare network switch to UVic for future maintenance.
  - .8 Standard of Acceptance: NTron 708TX
- .12 PLC Equipment:

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- .1 Standard of Acceptance: AB 1769 CompactLogix 5370 complete with modules:
  - .1 Controller: CompactLogix 1769-L33ER
  - .2 16 24VDC Input Module: 1769-IQ16
  - .3 16 Relay Output Module: 1769-OW16
  - .4 8 Point Analog Input Module: 1769-IF8
  - .5 8 Analog Current Output Module: 1769-OF8C
  - .6 Power Supply: 1769-PB4
- .13 Interposing relays:
  - .1 Provide interposing relays as shown on plans, 120VAC, 24VAC/VDC as required. All relays to have check button and indicator lights; DIN mount, finger-safe, form C.
- .14 Emergency Run Timer relays:
  - .1 Provide adjustable delay-on-make/delay-on-break relays as shown on plans, 120VAC, 24VAC or 24VDC coils as required. Delay on make, delay on break. All relays to have check button and indicator lights; DIN mount, finger-safe, form C.
  - .2 Standard of Acceptance: Eaton TRW27
- .15 Intrinsically Safe Relays:
  - .1 Suitable for Class 1 Division II usage.
  - .2 DIN rail mounting
  - .3 1 and 2 channel devices as specified in the Contract Drawings
  - .4 120VAC or 24VAC/24VDC powered, as required
- .16 Intrinsically Safe Barriers:
  - .1 Transmits supplied or active 0/4-20mA signals from the hazardous area to a load (active or passive) in the safe area.
  - .2 Suitable for Class 1 Division II usage.
  - .3 DIN rail mounting
  - .4 120VAC or 24VAC/24VDC powered, as required
- .17 Alternating Relay
  - .1 Output Contacts: SPDT

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- .2 Socket: 8-Pin with hold-down spring
- .3 Voltage: 120VAC
- .4 Standard of Acceptance: Eaton D85 Series.
  
- .18 Power Supply
  - .1 Standard of Acceptance: Phoenix Contact Quint-PS/1AC/24DC/20
  
- .19 UPS
  - .1 Standard of Acceptance: Always On GES-N-Series
    - .1 Capacity: 1000VA
    - .2 Voltage In/Out: 115VAC
    - .3 Input Plug: 5-15P
    - .4 Output Receptacles: 5-15R
    - .5 Include wall/panel mount bracket kit
  
- .20 Circuit Breakers
  - .1 Standard of Acceptance: Phoenix Contact UT 6-TMC series with Phoenix Contact FBS Series plug-in bridges.
  
- .21 Terminals and interconnect wiring:
  - .1 In accordance with Section 26 05 00 - Common Work Results - Electrical.
  - .2 DIN rail mounted terminals c/w dividers and end stops as required. Provide 10 spare terminals on each section and additional spare terminals as noted on the Drawings.
  - .3 Utilize plastic finger wiring ducts for organization of all interior and field wiring. Ducts are to be filled to no more than 50% of capacity.
  - .4 Use ferrules at termination points on stranded wires.
  - .5 A space of 200 mm must be kept clear for field wiring. All wiring labels must be clearly visible at completion.

**2.3 MOTOR CONTROL CENTER COMPONENTS**

- .1 Provide motor control centre in accordance with Section 26 24 19 – Motor Control Centres.
  
- .2 Equipment layouts shown on the Contract Drawings represent approximate locations only, Contractor shall provide shop drawings for the Motor Control Centre including detailed equipment layouts and panel dimensions.

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## 2.4 MOTOR CONTROL CENTRE ADDITIONAL COMPONENTS

- .1 Variable Frequency Drive
  - .1 Wet Well Ventilation Fan
    - .1 The VFDs shall be selected in accordance with the ventilation fan motor ratings, sized on the requirement of 0.25HP.
    - .2 Overload rating:
      - .1 150% for one minute of motor FLA
      - .2 125% continuous of motor FLA.
    - .3 Provide Terminal blocks for field wiring.
    - .4 Include inputs for VFD start/stop, high speed, low speed.
    - .5 Include relay outputs for VFD running and fault status.
    - .6 Provide push button for fault reset on the exterior of control panel.
    - .7 Provide adequate ventilation for stated site conditions.
    - .8 Mount within motor control panel enclosure.
    - .9 Provide remote mounted control panel installed on front door of motor control panel.
      - .1 Include panel platform for docking of control panel.
    - .10 Standard of Acceptance: AB Powerflex 25A-V1P6N114 + Panel Holder Mounting Kit
  - .2 Pump Motors
    - .1 The VFDs shall be selected in accordance with the pump motor ratings, sized on the requirement of 44HP.
    - .2 Overload rating:
      - .1 150% for one minute of motor FLA
      - .2 125% continuous of motor FLA.
    - .3 Provide Terminal blocks for field wiring.
    - .4 Include inputs for VFD start/stop.
    - .5 Include relay outputs for VFD running and fault status.
    - .6 Provide push button for fault reset on the exterior of motor control panel.
    - .7 Provide adequate ventilation for stated site conditions.
    - .8 Mount within motor control centre.
    - .9 Provide remote mounted control panel installed on front door of motor control panel.
      - .1 Include panel platform for docking of control panel.
    - .10 Standard of Acceptance: ABB ACS550+ Panel Holder Mounting Kit
- .2 DV/DT Equipment:

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- .1 Provide open frame dv/dt filter as indicated on the drawings on the load side of the VFD.
- .2 Mount within motor control centre.
- .3 Standard of Acceptance: Transcoil V1K Series.
- .3 Line Reactor Equipment:
  - .1 Provide open frame line reactor as indicated on the drawings on the line side of the VFD.
  - .2 Mount within motor control centre.
  - .3 Standard of Acceptance: Transcoil KDR Series
- .4 Phase Loss Monitoring Relay
  - .1 Provide relay capable of determining phase loss, phase reversal or phase imbalance.
  - .2 Mount within Motor Control Centre.
  - .3 Standard of Acceptance: Controlab Inc. DSP-1L 600V
- .5 Wiring Identification
  - .1 Provide wiring identification in accordance with electrical drawings.
- .6 Equipment Identification
  - .1 Provide equipment identification in accordance with Section 26 05 00 - Common Work Results for Electrical.
    - .1 Individual compartment nameplates.

**2.5 EXTERNAL CONTROL COMPONENTS**

- .1 Level Sensor Equipment:
  - .1 Standard of Acceptance: Siemens Transducer Head Echomax XRS-5
- .2 Wet Well, Chamber, and Termination Compartment Hatch Switch:
  - .1 Enclosure Material: 304 stainless steel with corrosion resistant coating (polyurethane)
  - .2 Approvals: Class I, Div. 1 & 2, Groups A-D
  - .3 Contact Form: SPDT (Form C)
  - .4 Lead Wires: 1829mm (72") minimum
  - .5 Sensing: End Sensing
  - .6 Standard of acceptance: Topworx Go Switch 31-17546-A3 c/w AMP3 Magnet
- .3 Door Switches

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- .1 Provide a door switch mounted to the kiosk such that actuation occurs when each door with handle is opened.
  - .2 Door switch shall have a lever type actuation with 1 normally open and 1 normally closed set of contacts.
  - .3 Door switch shall be rated for hazardous application locations including gasses (explosion), dust environment, NEMA Types 2, 4, 6P, 7, 9, 13.
  - .4 Standard of Acceptance: Telemecanique “XCKP Class 9007 Type C” or approved equal.
- .4 Flow Meter:
- .1 Refer to Mechanical Drawings and Specifications.
- .5 Valve Chamber Flood Switch
- .1 Service: Liquids compatible with wetted materials.
  - .2 Materials: 316 SS
  - .3 Enclosure Rating: Weatherproof, Class 1 Zone 2
  - .4 Switch Type: DPDT Contacts
  - .5 Voltage: 5A at 120VAC, 3A at 30VDC
  - .6 Electrical Conduit Connection: ¾” Female NPT
  - .7 Process Connection/Mounting: 1-1/2” Male NPT
  - .8 Mounting Orientation: Top mounted for vertical flange installation.
  - .9 Standard of Acceptance: Dwyer Series L4 Flotect Float Switch
- .6 Wet Well Float Switches:
- .1 Provide float switches with contacts that will activate in the presence of liquid.
  - .2 Specific Gravity: 0.95 – 1.10
  - .3 Materials:
    - .1 Body: Polypropylene (Grey)
      - .1 Length: 162mm
    - .2 Strain Relief: EPDM Rubber
    - .3 Weight: Zinc
  - .4 Cable:
    - .1 Conductors: 3C No. 18
    - .2 Length: to suit installation. 20m minimum.
    - .3 Coil excess cable on hanger cable support.
  - .5 Standard of acceptance: Flygt ENM-10 Level Regulator.

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## **2.6 FINISHES**

- .1 Apply finishes in accordance with Section 26 05 00 - Common Work Results for Electrical and Section 26 05 31 - Splitters, Junction, Pull Boxes and Cabinets.

## **2.7 EQUIPMENT IDENTIFICATION**

- .1 Provide equipment identification in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Nameplates:
  - .1 White plate, black letters.
  - .2 Complete board labeled: "Controls Cabinet"
  - .3 Other labels to be worded as per the Plans.

## **3. EXECUTION**

### **3.1 INSTALLATION**

- .1 Install control panel as indicated in the drawings.
- .2 Apply touch up paint as required.
- .3 Make field power and control connections as indicated.
- .4 Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and datasheet.
- .5 Supply all necessary equipment and wiring to provide the points connected to the equipment as shown on the plans.
- .6 Assemble the pump station control panel to include, but not limited to, the following components:
  - .1 PLC
  - .2 Network Switch
  - .3 Radio
  - .4 Power Supply
  - .5 Circuit Breakers
  - .6 Timer Relays
  - .7 Relays
  - .8 MiniCASII



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- .9 GFCI Receptacle
- .10 Terminal Blocks
- .11 Intrinsically Safe Relays
- .12 Front Panel
  - .1 HMI
  - .2 Selector Switches
  - .3 Pilot Devices
  - .4 Ethernet bulkhead receptacle
  - .5 Wiring to the front panel shall be enclosed within spiral wrap to allow for ease of door movement and protection.
- .13 Finger ducting: Unless installed in conduit, all wiring within the Control Panel shall be routed using finger ducting.
- .14 Supply and install din rail mounted interposing relays as shown on the plans.
  
- .7 Assemble the pump station Motor Control Centre to include, but not limited to, the following components:
  - .1 Disconnect Switches.
  - .2 VFDs including line reactors and DV/DT filters
  - .3 Ventilation Fans
  - .4 Phase Monitoring Relay
  - .5 Standstill Relays
  - .6 Finger ducting: all wiring within the Motor Control Panel shall be routed using finger ducting.
  - .7 Supply and install din rail mounted terminal blocks and interposing relays as required.
  - .8 Finger ducting: Unless installed in conduit, all wiring within the cabinets shall be routed using finger ducting.
  
- .8 External sensors and connections:
  - .1 Supply, install and connect mechanical control equipment as shown on drawings including:
    - .1 Flow meter sensors/transmitters.
    - .2 Pressure transmitters.
    - .3 Electrical valve actuators.
    - .4 Chamber flood switches.

**3.2 CONTROLS**

- .1 The Contractor shall demonstrate end-to-end functionality of each PLC point to the field equipment to the Owner's Representative prior to installation of the software.

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- .2 PLC programming by Others. PLC shall be programmed to allow for:
  - .1 Lead/lag operation through use of the level sensor electronics. The lead and lag pumps shall alternate on each pump cycle.
  - .2 Emergency pump operation when transducer level high, or high level float switch activated.
  - .3 I/O as shown on plans.
- .3 The Contractor shall configure the Multiranger 200 using level setpoints provided by the Civil Engineer.
- .4 The Contractor shall configure the flow meter transmitter to display flow rate in L/second and allow for all I/O signals to interface with the PLC.
- .5 VFDs:
  - .1 The Contractor shall configure the VFDs for the application, including but not limited to:
    - .1 Motor Nominal Voltage
    - .2 Motor Nominal Current
    - .3 Motor Nominal Frequency
    - .4 Motor Nominal Speed
    - .5 Motor Nominal Power
  - .2 VFDs shall be programmed to allow for the following:
    - .1 Fault on phase loss.
    - .2 Automatic reset on overcurrent, overvoltage, and undervoltage, three trials, trial time 30 seconds.
  - .3 VFD manufacturer to provide commissioning start-up assistance at site. Manufacturer's representative(s) shall be fully familiar with the equipment supplied under this Contract and be factory-trained in the use and application of the manufacturer's equipment and components.

### 3.3 MAINTENANCE MATERIALS

- .1 Provide:
  - .1 Ten (10) spare fuses of each type used in the panel.
  - .2 One (1) control relay of each type used in the control panel.
  - .3 Any other components which the Contractor recommends to be kept as spares.

Consulting Engineers:  
PBX Engineering Ltd.

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**CITY OF COURTENAY**

Greenwood Pump Stations

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**3.4 FIELD QUALITY CONTROL**

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Ensure moving and working parts are lubricated where required.
- .3 Operate system to prove satisfactory performance of complete system during 24 hour period.

**END OF SECTION**