



RETURN BIDS TO:

RETOURNER LES SOUMISSIONS À:

Public Works and Government Services Canada
Canada Place/Place du Canada
10th Floor/10e étage
9700 Jasper Ave/9700 ave Jasper
Edmonton
Alberta
T5J 4C3
Bid Fax: (780) 497-3510

**SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION**

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address
Raison sociale et adresse du
fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution
Public Works and Government Services Canada
Canada Place / Place du Canada
10th Floor / 10e étage
9700 Jasper Ave / 9700 ave Jasper
Edmonton
Alberta
T5J 4C3

Title - Sujet Sewer Lift Station Upgrade	
Solicitation No. - N° de l'invitation EP922-210257/A	Amendment No. - N° modif. 003
Client Reference No. - N° de référence du client AAFC EP922-210257	Date 2020-07-15
GETS Reference No. - N° de référence de SEAG PW-SPWU-004-11855	
File No. - N° de dossier PWU-0-43021 (004)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2020-07-28	Time Zone Fuseau horaire Mountain Daylight Saving Time MDT
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Espedido, Karielen K.	Buyer Id - Id de l'acheteur pwu004
Telephone No. - N° de téléphone (780) 231-4719 ()	FAX No. - N° de FAX (780) 497-3510
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction:	

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

This amendment has been raised with the following changes:

AMENDMENT #003:

ADDENDUM #002:

The following changes to the tender documents are effective immediately and will form part of the Contract documents:

SPECIFICATIONS & DRAWINGS

-Section 26 29 03 "Control Devices" called for the ultrasonic level monitoring devices, building management system panel, pump control panel, and time clock panel are to be provided as separate units. It is now to be a single control panel at each lift station be provided to accommodate the functionality of all devices.

-Please remove Section 26 29 03 and Section 01 11 00 of the original tender package and replace with Section 26 29 03 Rev 01 and Section 01 11 00 Rev 02 respectively (see attached).

BIDDERS' QUESTIONS & ANSWERS

Q1: The spec has called for cooling jackets on the sewage pumps, small horsepower pumps like the ones required in Lift Station 1 often do not have these. Are cooling jackets a must requirement for all pumps? (section 22 10 10, 2.1)

A1: Cooling jackets are only required for Lift Station 2 and Lift Station 3 pumps.

Q2: The spec has called for pumps capable of a minimum of 30 starts per hour, is 20 starts per hour considered an acceptable amount? (section 22 10 10, 2.1)

A2: 20 starts per hour is acceptable.

Q3: The spec has mentioned that sewage pumps are to be supplied with a pump control panel that allows communication with the existing BMS panel. Are we able to get a mechanical specification of the existing panel to confirm/supply a control panel that will be compatible with existing? (section 22 10 10, 2.1)

A3: The control work has been revised. Please see attached.

Q4: What are the existing pipe connection sizes of Lift Stations #1, #2, and #3 that new sewage pumps are to match up with?

A4: Lift Station #1: Inlet 75mm, outlet 100mm. Lift Station #2: 150mm inlet, outlet 100mm. Lift Station #3: 150mm inlet, outlet 100mm.

Q5: On Detail 2/C303 it notes Frame covers to suite agitator platform and walkway. Are these existing or is there a detail on how these need to be created?

A5: The agitator platform and walkway are existing items that are to remain. Covers are also existing but are to be replaced as part of this project in accordance with the "New Cover Details (typical)" found on the bottom left of page C303.

END OF AMENDMENT

Part 1 General

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract involves a renovation upgrade to three sewage lift stations at the AAFC Research and Development Centre in Lethbridge, AB
- .2 Perform all work indicated on the drawings including work, but not limited to, the following:
 - .1 Note the following work restrictions:**
 - .1 In each lift station, both the dry well and the wet well areas have been designated a Confined Space for work execution.
 - .2 The wet well is classified electrically as a Zone 2 Location for an explosive gas atmosphere and Category 2 area for a wet and corrosive atmosphere, as per Section 18 and Section 22 of the CEC 2018, respectively.
 - .3 Work must be executed in stages to minimize disruption or risk of disruption. If an extended downtime is required, the Contractor must provide supplemental storage and/or removal, transport, and disposal of sewage. Required staging of the work is presented, following this section.
 - .4 A mobile hydro-vac truck is to be on standby and available to transfer sewage in an emergency, whenever pump service is disrupted.
 - .5 Verify the size, clearance and precise placement of all standby generators prior to commencement of the work. Adjust the generator pad size and placement as well as the fence locations and dimensions as required
 - .2 Work Sequence**
 - .1 Work to be completed starting with Lift Station 1, then Lift Station 3, and finish with Lift Station 2. Each lift station is to be completed and commissioned before starting at the next location
 - .2 Service change over to the new electrical equipment is to occur during off peak hours for the lift station. Pumps are to be changed over during off peak hours.
 - .3 Work is to be completed in three stages.
 - .1 Stage 1: Lift Station #1**
 - .1 Civil works, generator pad, new generator, trenching and installation of new power to building. Commissioning of generator. Installation of fencing around generator.
 - .1 Excavate and prepare a trench that minimizes the impact to the local environment that is in accordance with all local environmental bylaws. Install electrical conduits and gas lines. Provide all required generator power and control cables that is to be terminated to new and existing equipment.

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- .2 Install concrete gen-set pad. Coordinate with M&E discipline to prepare the area as indicated on the plans. Adjust as necessary
 - .3 Install 25kW outdoor emergency stand-by generator.
 - .4 Install new outdoor-rated generator tap-box for provisions for manual transition to a mobile generator connection.
 - .5 Make all electrical and gas-line connections.
 - .6 Procure and provide testing/commissioning of the generator by the manufacturer's field service representative. Provide a load-bank for the testing of the generator functions.
 - .7 Install fencing detailed in Structural scope of work.
 - .8 Demolish existing Automatic Transfer Switch (ATS). Install the new ATS.
 - .9 Provide and install all necessary hardware, conductors, conduit, and associated equipment for making the connections between the generator, generator tap-box, ATS, and existing main service disconnect. Arrange for all necessary utility work such as shut-downs and energizations.
 - .10 Provide testing/commissioning of the ATS by the manufacturer's field representative. Test all functions and transfer sequences between Utility and Emergency sources.
 - .11 Decommission and remove the existing generator from inside the LS#1 building. Remove all associated conduits, conductors, hardware, and associated breaker disconnect switch.
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- .2 Remove and replace Pump 1, Install new control system and new pump and commission.
 - .1 Install new local motor-disconnects for sewage pumps.
 - .2 Disconnect all existing connections and wiring to the sewage pump.
 - .3 Demolish the existing sewage pump.
 - .4 Install new sewage pump.
 - .5 Demolish the existing FVNR starter cabinet.
 - .6 Install a new Soft-Starter cabinet in place of the existing.
 - .7 Demolish the existing electrical cables and conduit feeding the sewage pumps and install new cables for the soft-starter and the pump.
 - .8 Commission the new pump. Test that the pump is operational under Manual control.

- .9 Disconnect all existing connections and wiring associated with the sensors and control devices.
- .10 Install new Unified Station Control Panel. Install replacement control-wiring, sensor/metering wiring to field devices, equipment, ATS, motor soft-starters, pumps. Reconnect existing devices.
- .11 Make all SCADA and BMS connections and configurations for the Unified Station Control Panel. See Mechanical specifications for requirements.
- .12 Test automatic operation of the sewage pump via run signals from the Unified Station Control Panel. Test BMS system and Communication system with AAFC main campus building. Test monitoring / data logging.
- .13 Test operation of all new devices and finalize commissioning. Test pump control functions under generator source-transfer.
- .3 After Pump 1 commissioned, remove and replace Pump 2 (same scope of work as Pump 1), Install new control system and new pump and commission.
- .4 De-energize and disconnect all existing connections and wiring to the following existing equipment in order to facilitate replacement of mechanical equipment and future power and control re-connections. Remove and dispose of the Mechanical equipment. Retain any conductors and conduit required for making future connections to new equipment.
 - .1 Control damper located on south wall of the dry well,
 - .2 The existing air make up unit hanging from the ceiling located in the dry well,
 - .3 The exhaust fan located above the dry well,
 - .4 The exhaust fan located above the wet well,
 - .5 Thermostats and controllers as indicated on the plans,
 - .6 Manual motor-starter switches as indicated on the plans.
- .5 Supply and install the following new mechanical equipment. Supply and install all necessary hardware, conductors, conduit, and devices for making connections to existing and new equipment.
 - .1 New control damper for the penetration on the south wall of the dry well.
 - .2 New air make up unit hung from the ceiling of the dry well.
 - .3 New roof mounted exhaust fan above the dry well,
 - .4 New roof mounted exhaust fan above the wet well,
 - .5 New weather hoods with bird and insect screens as indicated on the plans,

- .6 New thermostats and controllers as indicated on the plans,
- .7 New manual motor-starter switches as indicated on the plans.
- .8 New Emergency Lighting battery pack.
- .9 Install all signage

.2 Stage 2: Lift Station #3

- .1 Civil works, generator pad, new generator, trenching and installation of new power to building. Commissioning of generator. Installation of fencing around generator.
 - .1 Excavate and prepare a trench that minimizes the impact to the local environment that is in accordance with all local environmental bylaws. Install electrical conduits and gas lines. Provide all required generator power and control cables that is to be terminated to new and existing equipment.
 - .2 Install concrete gen-set pad. Coordinate with M&E discipline to prepare the area as indicated on the plans. Adjust as necessary
 - .3 Install 45kW outdoor emergency stand-by generator.
 - .4 Install new outdoor-rated generator tap-box for provisions for manual transition to a mobile generator connection.
 - .5 Make all electrical and gas-line connections.
 - .6 Procure and provide testing/commissioning of the generator by the manufacturer's field service representative. Provide a load-bank for the testing of the generator functions.
 - .7 Install fencing detailed in Civil scope of work.
 - .8 Install new 200A disconnect (service-entrance) inside the Lift Station.
 - .9 Provide and install all necessary hardware, conductors, and conduit for making the connections between the generator, generator tap-box, MCC, and new main service disconnect.
 - .10 Decommission and remove the existing generator from inside the LS#3 building. Remove all associated conduits, conductors, and hardware. Remove existing gas-lines and connections as per Mechanical specifications.

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- .2 Install new power and electrical equipment in lift station.
Arrange for all necessary utility work such as shut-downs and energizations.
 - .1 De-energize and disconnect all connections, hardware and wiring to the existing Motor Control Center (MCC). Retain any conductors and conduit for making future connections.
 - .2 Demolish and remove the existing MCC.
 - .3 Install new MCC in place of the existing footprint. Demolition of existing MCC and replacement with new MCC to occur concurrently with the sewage pump replacement shown in subsequent Step 3.
 - .4 Re-install existing service conductors to the new main disconnect.
 - .5 Install all necessary hardware, conduit, conductors and associated devices for making the connections between the generator tap-box, service disconnect, MCC, integral Automatic Transfer Switch and Unified Control Panel.
 - .6 Provide testing & commissioning by MCC manufacturer's field service representative. Test all functions and transfer sequences between Utility and Emergency source.
 - .3 Remove and replace Pump 1, Install new control system and new pump and commission.
 - .1 Disconnect existing connections and wiring at the sewage pumps in order to facilitate replacement and future power and control connections.
 - .2 Install new local motor-disconnects for the sewage pumps.
 - .3 Demolish the existing electrical cables and install new VFD-rated cables and conduit for the VFD cabinets and the sewage pump.
 - .4 Demolish the existing sewage pump. Install new pump.
 - .5 Make all connections. Commission the new pump. Test that pump is operational under Manual Control.
 - .6 Disconnect all existing connections and wiring associated with the sensors and control devices.
 - .7 Install new Unified Station Control Panel. Install replacement control-wiring, sensor/metering wiring to field devices, equipment, ATS, VFD cabinets, pumps. Reconnect existing devices.
 - .8 Make all SCADA and BMS connections and configurations for the Unified Station Control Panel. See Mechanical specifications for requirements.

- .9 Test automatic operation of the sewage pump via run signals from the Unified Station Control Panel. Test BMS system and Communication system with AAFC main campus building. Test monitoring / data logging.
 - .10 Test operation of all new devices and finalize commissioning. Test pump control functions under generator source-transfer.
 - .11 Agitator motor and gear box to be replaced with new. Agitator shaft and impellor to remain. Connect motor to new controls.
 - .12 Existing blowers to remain and reconnected to new controls. Utilize existing wiring
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- .4 After Pump 1 fully commissioned, remove and replace Pump 2 (same scope of work as Pump 1), Install new control system and new pump and commission.
 - .5 Make all connections for the existing blower pumps. Test operation.
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- .6 De-energize and disconnect all existing connections and wiring to the following existing equipment in order to facilitate replacement of mechanical equipment and future power and control re-connections. Remove and dispose of the Mechanical equipment. Retain any required conductors and conduit required for making future connections to new equipment.
 - .1 Control damper located in the dry well,
 - .2 The existing natural gas unit heater hanging from the ceiling located in the dry well,
 - .3 The exhaust fan located above the dry well,
 - .4 The exhaust fan located above the wet well,
 - .5 Thermostats and controllers as indicated on the plans,
 - .6 Two agitator motors located above the exterior storage cells
 - .7 Manual motor-starter switches as indicated on the plans.
 - .7 Supply and install the following new mechanical equipment. Supply and install all necessary hardware, conductors, conduit, and devices for making connections to existing and new equipment.
 - .1 New control damper for the penetration on the south wall of the dry well.
 - .2 New natural-gas heater on the ceiling of the dry well,
 - .3 New roof mounted exhaust fan above the dry well,
 - .4 New roof mounted exhaust fan above the wet well,

- .5 New weather hoods with bird and insect screens as indicated on the plans,
- .6 New thermostats and controllers as indicated on the plans,
- .7 New manual motor-starter switches as indicated on the plans.
- .8 New Emergency Lighting battery packs
- .8 Civil
 - .1 Repair fencing surrounding the lift station's storage cells.
 - .2 Install new fencing with man gate around the new generator on perimeter of equipment pad for lift station 1 and lift station 2.
 - .3 Install new signage on the fencing surrounding the lift station's storage cells.
 - .4 Construct new lids to be placed overtop the existing storage cells.

.3 Stage 3: Lift Station #2

- .1 Civil works, generator pad, new generator, trenching and installation of new power to building. Commissioning of generator. Installation of fencing around generator.
 - .1 Excavate and prepare a trench that minimizes the impact to the local environment that is in accordance with all local environmental bylaws. Install electrical conduits and gas lines. Provide all required generator power and control cables that is to be terminated to new and existing equipment.
 - .2 Install concrete gen-set pad. Coordinate with M&E discipline to prepare the area as indicated on the plans. Adjust as necessary
 - .3 Install 45kW outdoor emergency stand-by generator.
 - .4 Install new outdoor-rated generator tap-box for provisions for manual transition to a mobile generator connection.
 - .5 Make all electrical and gas-line connections.
 - .6 Procure and provide testing/commissioning of the generator by the manufacturer's field service representative. Provide a load-bank for the testing of the generator functions.
 - .7 Demolish existing Automatic Transfer Switch (ATS). Install the new ATS.

- .8 Provide and install all necessary hardware, conductors, conduit, and associated equipment for making the connections between the generator, generator tap-box, ATS, and existing main service disconnect. Arrange for all necessary utility work such as shut-downs and energizations.
 - .9 Provide testing/commissioning of the ATS by the manufacturer's field representative. Test all functions and transfer sequences between Utility and Emergency sources.
 - .10 Decommission and remove the existing generator from inside the LS#2 building. Remove all associated conduits, conductors, hardware, and associated breaker disconnect switch.
- .2 Remove and replace Pump 1, Install new control system and new pump and commission.
- .1 Install new local motor-disconnects for the sewage pumps.
 - .2 De-energize and disconnect all existing connections and wiring to the sewage pump in order to facilitate replacement and future power and control connections.
 - .3 Demolish the existing sewage pump.
 - .4 Install new sewage pump.
 - .5 Demolish and remove the existing Variable Frequency Drive (VFD) starter cabinets and associated line and load reactors.
 - .6 Install a new VFD cabinet in place of the existing.
 - .7 Demolish the existing electrical cables and conduit feeding the sewage pumps and install new cables for the VFDs and the pump.
 - .8 Commission the new pump. Test that the pump is operational under Manual control.
 - .9 Disconnect all existing connections and wiring associated with the sensors and control devices.
 - .10 Install new Unified Station Control Panel. Install replacement control-wiring, sensor/metering wiring to field devices, equipment, ATS, VFD cabinets, pumps. Reconnect existing devices.
 - .11 Make all SCADA and BMS connections and configurations for the Unified Station Control Panel. See Mechanical specifications for requirements.
 - .12 Test automatic operation of the sewage pump via run signals from the Unified Station Control Panel. Test

[BMS system and Communication system with AAFC main campus building. Test monitoring / data logging.](#)

- .13 Test operation of all new devices and finalize commissioning. Test pump control functions under generator source-transfer.
- .3 After Pump 1 commissioned, remove and replace Pump 2 (same scope of work as Pump 1), Install new control system and new pump and commission.
- .4 De-energize and disconnect all existing connections and wiring to the following existing equipment in order to facilitate replacement of mechanical equipment and future power and control re-connections. Remove and dispose of the Mechanical equipment. Retain any required conductors and conduit for making future connections to new equipment.
 - .1 Control damper located on the south wall of the dry well,
 - .2 The existing air make up unit hanging from the ceiling located in the dry well,
 - .3 The exhaust fan located above the dry well,
 - .4 The exhaust fan located above the wet well,
 - .5 Thermostats and controllers as indicated on the plans,
 - .6 Manual motor-starter switches as indicated on the plans.
 - .7 Demolish existing line and load reactors.
 - .8 Demolish existing light fixtures in the Wet-Well area.
 - .9 Demolish existing light switch in the Wet-Well area
 - .10 Demolish existing conduit and wiring in the Wet-Well area.
- .5 Supply and install the following new mechanical equipment. Supply and install all necessary hardware, conductors, conduit, and devices for making connections to existing and new equipment.
 - .1 New control damper for the penetration on the south wall of the dry well.
 - .2 New air make up unit hung from the ceiling of the dry well.
 - .3 New roof mounted exhaust fan above the dry well,
 - .4 New roof mounted exhaust fan above the wet well,
 - .5 New weather hoods with bird and insect screens as indicated on the plans,
 - .6 New thermostats and controllers as indicated on the plans,
 - .7 New manual motor-starter switches as indicated on the plans.

- .8 New LED light fixtures in the Wet-Well area, rated for a Zone 2 Hazardous environment.
 - .9 New light switch in the Wet-Well area, rated for a Zone 2 Hazardous environment.
 - .10 New TECK90 wiring to replace all existing lighting wiring in the Wet-Well area.
 - .11 New Emergency Lighting battery pack.
 - .12 Install all signage
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- .4 Work includes demolition of all existing systems that are to be replaced in the above work. Any areas damaged during the demolition and renovation of the facility (cut-outs, patching, holes, etc.) must be repaired to its original state.
 - .5 Any penetrations made throughout the work, must be properly covered and sealed. Any penetrations through existing fire rated walls or ceilings must be fire stopped.
 - .6 Remove all waste material off site and dispose of the waste according to Section 01 74 21 and in compliance with the City of Lethbridge regulations
 - .7 Work also includes start-up, commissioning, and training of all systems installed and modified.
 - .8 All materials and workmanship must be as per stamped plans and specifications within

1.2 WORK SEQUENCE

- .1 Construct Work in stages to accommodate Owner's continued use of premises during construction.
- .2 Refer to Section 01 32 16 for Project Schedule requirements.

1.3 CONTRACTOR USE OF PREMISES

- .1 Co-ordinate use of premises under direction of Departmental Representative.
- .2 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
- .3 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Departmental Representative.
- .4 At completion of operations condition of existing work: equal to or better than that which existed before new work started.
- .5 Maintain fire access/control.

1.4 OWNER OCCUPANCY

- .1 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

1.5 EXISTING SERVICES

- .1 Notify, Departmental Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Departmental Representative 48 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance
- .3 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.
- .4 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .5 Provide temporary services when directed by Departmental Representative.
- .6 Where unknown services are encountered, immediately advise Departmental Representative.
- .7 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

1.6 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy each document as follows:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed Shop Drawings.
 - .5 List of Outstanding Shop Drawings.
 - .6 Change Orders.
 - .7 Other Modifications to Contract.
 - .8 Field Test Reports, System Components List completed with commissioning verification forms, check sheets and commissioning Issues/Resolution Log
 - .9 Copy of Approved Work Schedule.
 - .10 Health and Safety Plan and Other Safety Related Documents.
 - .11 Other documents as specified.

Part 2 Products

- .1 Not Used

Part 3 Execution

- .1 Not Used

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 CSA International
 - .1 CSA C22.2 No.14, Industrial Control Equipment.
- .2 National Electrical Manufacturers Association (NEMA)
 - .1 NEMA ICS 1, Industrial Control and Systems: General Requirements.

1.2 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 Alberta, Canada.
 - .2 Include schematic, wiring, interconnection diagrams.

1.3 QUALITY ASSURANCE

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

1.4 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.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 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 in dry location 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.

Part 2 Products

2.1 AC CONTROL RELAYS

- .1 Control Relays: to CSA C22.2 No.14.
- .2 Convertible contact type: contacts field convertible from NO to NC, double-voltage type with sliding barrier to permit access to contacts only or coil only .

2.2 RELAY ACCESSORIES

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

2.3 CONTROL AND RELAY PANELS

- .1 CSA Type 1 sheet steel enclosure with hinged padlockable access door, accommodating relays timers, labels, as indicated, factory installed and wired to identified terminals.

2.4 THERMOSTAT (LINE VOLTAGE)

- .1 T-1-1
 - .1 Wall mounted cooling thermostat, controlling CD-1-1, CD-1-2, and EX-1-3, as specified on the Mechanical Planset.
 - .2 Full load rating as required by the approved equipment.
 - .3 Thermostat specifications to match existing specifications.
 - .4 If existing thermostat specifications are no longer available relays and controls are required to ensure the function of the control strategy indicated. Contact Departmental Representative if required.
 - .5 Markings in 5 degrees increments.
 - .6 Equipped with wired remote copper bulb.
- .2 T-2-1
 - .1 Wall mounted cooling thermostat, controlling CD-2-1 and EX-2-3, as specified on the Mechanical Planset.
 - .2 Full load rating as required by the approved equipment.
 - .3 If existing thermostat specifications are no longer available relays and controls are required to ensure the function of the control strategy indicated. Contact Departmental Representative if required.
 - .4 Markings in 5 degrees increments.
 - .5 Equipped with wired remote copper bulb.
- .3 T-3-1
 - .1 Wall mounted cooling thermostat, controlling CD-3-1 and EX-3-1, as specified on the Mechanical Planset.
 - .2 Full load rating as required by the approved equipment.

- .3 Markings in 5 degrees increments.
 - .4 Equipped with wired remote copper bulb.
- .4 T-3-2
 - .1 Wall mounted cooling thermostat, controlling CD-3-2 and EX-3-2, as specified on the Mechanical Planset.
 - .2 Full load rating as required by the approved equipment.
 - .3 If existing thermostat specifications are no longer available relays and controls are required to ensure the function of the control strategy indicated. Contact Departmental Representative if required.
 - .4 Markings in 5 degrees increments.
 - .5 Equipped with wired remote copper bulb.
- .5 T-3-3
 - .1 Wall mounted heating thermostat, controlling UH-1-1, as specified on the Mechanical Planset.
 - .2 If existing thermostat specifications are no longer available relays and controls are required to ensure the function of the control strategy indicated. Contact Departmental Representative if required.
 - .3 Full load rating as required by the approved equipment.
 - .4 Markings in 5 degrees increments.
 - .5 Equipped with wired remote copper bulb.

2.5 ULTRASONIC LEVEL MONITORING DEVICE

- .1 C-1-1
 - .1 Removed, and integrated into the Unified Station Control Panel.
- .2 C-2-3
 - .1 Removed, and integrated into the Unified Station Control Panel.
- .3 C-3-2
 - .1 Removed, and integrated into the Unified Station Control Panel.

2.6 EXTERNAL PIPE DOPPLER FLOW METER

- .1 C-1-2
 - .1 Removed, and integrated into the Unified Station Control Panel.
- .2 C-2-2
 - .1 Removed, and integrated into the Unified Station Control Panel.
- .3 C-3-5
 - .1 Removed, and integrated into the Unified Station Control Panel.

2.7 MANUFACTURER SUPPLIED CONTROLLERS

- .1 T-1-2
 - .1 Wall mounted manufacturer supplied controller for AMU-1-1.
 - .2 Accessories and warning lights to be provided as indicated in Section 23 54 16 – Fuel Fired Furnaces.
 - .3 Full load ratings to be coordinated with AMU-1-1 manufacturer.
 - .4 Temperature setting range to be coordinated with AMU-1-1 manufacturer.
 - .5 Thermometer Range to be coordinated with AMU-1-1 manufacturer.
 - .6 Markings in 5 degrees increments.
- .2 T-2-2
 - .1 Wall mounted manufacturer supplied controller for AMU-1-1.
 - .2 Accessories and warning lights to be provided as indicated in Section 23 54 16 – Fuel Fired Furnaces.
 - .3 Full load ratings to be coordinated with AMU-1-1 manufacturer.
 - .4 Temperature setting range to be coordinated with AMU-1-1 manufacturer.
 - .5 Thermometer Range to be coordinated with AMU-1-1 manufacturer.
 - .6 Markings in 5 degrees increments

2.8 BUILDING MANAGEMENT SYSTEM PANEL

- .1 C-1-3
 - .1 Removed, and integrated into the Unified Station Control Panel.
- .2 C-2-1
 - .1 Removed, and integrated into the Unified Station Control Panel.
- .3 C-3-1
 - .1 Removed, and integrated into the Unified Station Control Panel.

2.9 TIME CLOCK PANEL

- .1 C-3-5
 - .1 Removed, and integrated into the Unified Station Control Panel.

2.10 Unified Station Control Panel

- .1 C-1-4
 - .2 The ultrasonic level monitoring devices, building management system panel, pump control panel, and time control panel can be provided to site as a single control panel.
 - .3 A quantity of one control panel is to be provided per lift station and be configured for SCADA.
 - .4 Functionality:

- .1 The unified station control panel is to provide “Out of the box” control for a typical pump lift station configuration.
- .2 Be provided with pre-built configuration parameters which are selectable by the integrated user interface.
- .3 The panel is to be provided with an integral VFD control algorithm.
- .4 Provide control for two pumps.
- .5 Equipped with a compact flash port to allow for firmware upgrades, save/load configurations, download of data-logger through a .csv file, import/export of Modbus and DNP3 point lists in .csv format.
- .5 Inputs and Outputs
 - .1 A minimum number of inputs is required to achieve the functionality listed below. Coordinate with the controls provider to verify the exact quantity.
 - .2 A minimum number of outputs is required to achieve the functionality listed below. Coordinate with the controls provider to verify the exact quantity.
 - .3 The inputs and outputs of the panel are to include the following:
 - .1 Digital inputs (voltage free inputs), also configurable as counters or configurable for pump specific input and output devices.
 - .2 Digital outputs (240V, 5A resistive),
 - .3 Analog inputs (10 bit),
 - .4 Analog outputs (10 bit)
- .6 End User Configurable Parameters:
 - .1 Designation of pump mode to: Auto, Manual, or Off.
 - .2 Set-point adjustment for pump activation/deactivation and level alarms.
 - .3 Level device from 4-20mA, conductive probe or remote level.
 - .4 Selectable between fill/empty.
 - .5 Station optimization including:
 - .1 Max off time,
 - .2 Maximum pumps to run,
 - .3 Maximum starts per hour,
 - .4 Inter-pump start and stop delays,
 - .5 Maximum run time,
 - .6 Blocked pump detection,
 - .7 Well washer controls,
 - .8 Well clean out.
 - .6 Locked level alarm to indicate level device problems
 - .7 Pump alternation schemes:
 - .1 Fixed lead/duty

- .2 Alternation
- .7 The panel is to be provided with a Data-logger for user-defined faults and events.
 - .1 A minimum of 50,000 events recorded to the internal flash memory is required.
- .8 Electrical Systems Monitoring and Protection:
 - .1 The panel is required to be capable of monitoring the following points:
 - .1 3-Phase supply monitoring and supply protection including: under-voltage, over-voltage, phase fail, and phase rotation.
 - .2 DC supply, battery voltage, and internal temperature
 - .3 Energy, power and pump efficiency monitoring
 - .4 Motor protection must include:
 - .1 3-Phase current monitoring for each pump,
 - .2 Over and under current trips,
 - .3 Ground/earth fault
 - .4 Current phase imbalance fault,
 - .5 I²T fault
 - .6 Insulation resistance testing for motor windings.
- .9 Externally Provided Sensors:
 - .1 Ultrasonic Level Sensor
 - .1 Monitoring device to be surface wall mounted.
 - .2 Transducer depth for liquid applications to be 15 meters minimum.
 - .3 Accuracy of unit to be 0.25% of range or 6mm whichever is greater.
 - .4 Resolution of level monitoring device to be 2 mm maximum.
 - .5 Outputs of unit to be coordinated with control panel supplier as required.
 - .6 Unit to operate indoors at a geodetic elevation of 910 meters.
 - .7 Enclosure type for monitoring device to be NEMA 4X minimum.
 - .2 External Pipe Doppler Flow Sensor
 - .1 Performance Specifications
 - .1 The flow meter shall operate with a single-head flow sensor mounted externally on any contiguous pipe material that conducts sound including but not limited to: carbon steel, stainless steel, ductile iron, cement lined ductile iron, copper, FRP, PVC, or ABS pipe from 12.5 mm to 250.0 mm ID.
 - .2 Measure and indicate flow rates from +0.03 to +12.2 m/sec and -0.03 to -12.2 m/sec with accuracy of $\pm 2\%$ of

reading or ± 0.1 ft/sec, whichever is greater, on liquids with entrained particles or gases of 100 microns or larger and minimum concentrations of 75 ppm.

.2 Transducer (Flow Sensor)

- .1 The flow sensor shall be single-head, ultrasonic in a stainless steel housing. It shall be installed on the outside of a pipe without interrupting flow. The sensor shall be capable of continuous operation at temperatures from 0°C to 60°C, and able to withstand accidental submersion pressures to 10 psi. Manufacturer's recommended coupling compound and stainless steel mounting clamp shall be included.
- .2 Shall include 15 m sensor cable, shielded coaxial pair. Or as required based on routing determined on site by the contractor.
- .3 Shall be transformer isolated and designed to meet intrinsic safety requirements. Shall be designed and CE tested for maximum industrial noise rejection.

.3 Transmitter

- .1 The transmitter indicator shall be housed in a watertight and dust tight NEMA4X (IP 66) enclosure with a gasketed shatter proof window, suitable for wall mounting.
- .2 Flow meter electronics shall be designed to operate at temperatures from 0°C to 60°C. Electronic circuits are interchangeable with other flow meters having the same model number. The transmitter circuit and calibration frequency standard shall be crystal controlled. The transmitter shall be powered by 100-240VAC 50/60Hz requiring less than 10 VA.
- .3 Output to be compatible with the control panel.
- .4 Shall include noise suppression circuitry to filter electrical interference, and shall be tested for industrial noise immunity for CE certification, European Directive 2014/30/EU.
- .5 Shall be certified to UL/CSA/EN 61010-1.
- .6 Electronics shall be modular and field replaceable by means of plug-in circuit boards. The instrument shall detect and load software menus automatically for field-installed options.

.3 Time Clock

- .1 Digital time clock with visual read out of current time.
- .2 Time clock to have output to trigger pumps at a user defined time.

- .3 User defined time to be adjustable.
 - .4 Electrical specifications to be coordinated based on pump control panel and BMS panel.
 - .10 The unified control panel is to communicate directly with the AAFC Main Campus's BMS system by means of wireless communication. Transmission devices are to be provided atop each lift station and locate appropriately on the AAFC Main Campus building. The facility is currently equipped with a Siemens BMS system running on the BACnet/IP protocol. A gateway to be able to communicate back to the AAFC Main Campus building is required. The control graphics are required to be updated as needed.
 - .11 Control Points:
 - .1 Read
 - .1 Pump status,
 - .2 Pump alarms,
 - .3 Wet well door status,
 - .4 Dry well door status,
 - .5 Air make up unit status,
 - .6 Dry well room temperature,
 - .7 Wet well room temperature,
 - .8 Generator status,
 - .9 Generator alarms,
 - .10 Automatic transfer switch stats,
 - .11 Station time clock status,
 - .12 Wet well volume and level,
 - .13 Pump discharge flow rate,
 - .14 High Level Sensor Alarm
 - .2 Write
 - .1 Pump run,
 - .2 Pump stop,
 - .3 Generator run,
 - .4 Generator stop,
 - .5 Automatic transfer switch,
 - .6 Alarm reset,
 - .7 External existing building strobe
 - .8 Audible external building siren,
 - .12 Note that all trending data currently available on the Building's BMS are to remain.
- .2 C-2-4

- .3 The ultrasonic level monitoring devices, building management system panel, pump control panel, and time control panel can be provided to site as a single control panel.
- .4 A quantity of one control panel is to be provided per lift station and be configured for SCADA.
- .5 Functionality:
 - .1 The unified station control panel is to provide “Out of the box” control for a typical pump lift station configuration.
 - .2 Be provided with pre-built configuration parameters which are selectable by the integrated user interface.
 - .3 The panel is to be provided with an integral VFD control algorithm.
 - .4 Provide control for two pumps.
 - .5 Equipped with a compact flash port to allow for firmware upgrades, save/load configurations, download of data-logger through a .csv file, import/export of Modbus and DNP3 point lists in .csv format.
- .6 Inputs and Outputs
 - .1 A minimum number of inputs is required to achieve the functionality listed below. Coordinate with the controls provider to verify the exact quantity.
 - .2 A minimum number of outputs is required to achieve the functionality listed below. Coordinate with the controls provider to verify the exact quantity.
 - .3 The inputs and outputs of the panel are to include the following:
 - .1 Digital inputs (voltage free inputs), also configurable as counters or configurable for pump specific input and output devices.
 - .2 Digital outputs (240V, 5A resistive),
 - .3 Analog inputs (10 bit),
 - .4 Analog outputs (10 bit)
- .7 End User Configurable Parameters:
 - .1 Designation of pump mode to: Auto, Manual, or Off.
 - .2 Set-point adjustment for pump activation/deactivation and level alarms.
 - .3 Level device from 4-20mA, conductive probe or remote level.
 - .4 Selectable between fill/empty.
 - .5 Station optimization including:
 - .1 Max off time,
 - .2 Maximum pumps to run,
 - .3 Maximum starts per hour,
 - .4 Inter-pump start and stop delays,
 - .5 Maximum run time,

- .6 Blocked pump detection,
 - .7 Well washer controls,
 - .8 Well clean out.
 - .6 Locked level alarm to indicate level device problems
 - .7 Pump alternation schemes:
 - .1 Fixed lead/duty
 - .2 Alternation
 - .8 The panel is to be provided with a Data-logger for user-defined faults and events.
 - .1 A minimum of 50,000 events recorded to the internal flash memory is required.
 - .9 Electrical Systems Monitoring and Protection:
 - .1 The panel is required to be capable of monitoring the following points:
 - .1 3-Phase supply monitoring and supply protection including: under-voltage, over-voltage, phase fail, and phase rotation.
 - .2 DC supply, battery voltage, and internal temperature
 - .3 Energy, power and pump efficiency monitoring
 - .4 Motor protection must include:
 - .1 3-Phase current monitoring for each pump,
 - .2 Over and under current trips,
 - .3 Ground/earth fault
 - .4 Current phase imbalance fault,
 - .5 I²T fault
 - .6 Insulation resistance testing for motor windings.
 - .10 Externally Provided Sensors:
 - .1 Ultrasonic Level Sensor
 - .1 Monitoring device to be surface wall mounted.
 - .2 Transducer depth for liquid applications to be 15 meters minimum.
 - .3 Accuracy of unit to be 0.25% of range or 6mm whichever is greater.
 - .4 Resolution of level monitoring device to be 2 mm maximum.
 - .5 Outputs of unit to be coordinated with control panel supplier as required.
 - .6 Unit to operate indoors at a geodetic elevation of 910 meters.
 - .7 Enclosure type for monitoring device to be NEMA 4X minimum.
 - .2 External Pipe Doppler Flow Sensor
 - .1 Performance Specifications

- .1 The flow meter shall operate with a single-head flow sensor mounted externally on any contiguous pipe material that conducts sound including but not limited to: carbon steel, stainless steel, ductile iron, cement lined ductile iron, copper, FRP, PVC, or ABS pipe from 12.5 mm to 250.0 mm ID.
- .2 Measure and indicate flow rates from +0.03 to +12.2 m/sec and -0.03 to -12.2 m/sec with accuracy of $\pm 2\%$ of reading or ± 0.1 ft/sec, whichever is greater, on liquids with entrained particles or gases of 100 microns or larger and minimum concentrations of 75 ppm.
- .2 Transducer (Flow Sensor)
 - .1 The flow sensor shall be single-head, ultrasonic in a stainless steel housing. It shall be installed on the outside of a pipe without interrupting flow. The sensor shall be capable of continuous operation at temperatures from 0°C to 60°C, and able to withstand accidental submersion pressures to 10 psi. Manufacturer's recommended coupling compound and stainless steel mounting clamp shall be included.
 - .2 Shall include 15 m sensor cable, shielded coaxial pair. Or as required based on routing determined on site by the contractor.
 - .3 Shall be transformer isolated and designed to meet intrinsic safety requirements. Shall be designed and CE tested for maximum industrial noise rejection.
- .3 Transmitter
 - .1 The transmitter indicator shall be housed in a watertight and dust tight NEMA4X (IP 66) enclosure with a gasketed shatter proof window, suitable for wall mounting.
 - .2 Flow meter electronics shall be designed to operate at temperatures from 0°C to 60°C. Electronic circuits are interchangeable with other flow meters having the same model number. The transmitter circuit and calibration frequency standard shall be crystal controlled. The transmitter shall be powered by 100-240VAC 50/60Hz requiring less than 10 VA.
 - .3 Output to be compatible with the control panel.
 - .4 Shall include noise suppression circuitry to filter electrical interference, and shall be tested for industrial noise immunity for CE certification, European Directive 2014/30/EU.
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- .6 Electronics shall be modular and field replaceable by means of plug-in circuit boards. The instrument shall detect and load software menus automatically for field-installed options.
- .3 Time Clock
 - .1 Digital time clock with visual read out of current time.
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 - .4 Electrical specifications to be coordinated based on pump control panel and BMS panel.
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 - .5 Air make up unit status,
 - .6 Dry well room temperature,
 - .7 Wet well room temperature,
 - .8 Generator status,
 - .9 Generator alarms,
 - .10 Automatic transfer switch stats,
 - .11 Station time clock status,
 - .12 Wet well volume and level,
 - .13 Pump discharge flow rate,
 - .14 High Level Sensor Alarm
 - .2 Write
 - .1 Pump run,
 - .2 Pump stop,
 - .3 Generator run,
 - .4 Generator stop,
 - .5 Automatic transfer switch,

- .6 Alarm reset,
 - .7 External existing building strobe
 - .8 Audible external building siren,
- .13 Note that all trending data currently available on the Building's BMS are to remain.
- .14 C-3-6
 - .1 The ultrasonic level monitoring devices, building management system panel, pump control panel, and time control panel can be provided to site as a single control panel.
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 - .4 Dry well door status,
 - .5 Air make up unit status,
 - .6 Dry well room temperature,
 - .7 Wet well room temperature,
 - .8 Generator status,
 - .9 Generator alarms,
 - .10 Automatic transfer switch stats,
 - .11 Station time clock status,
 - .12 Wet well volume and level,
 - .13 Pump discharge flow rate,

- .14 High Level Sensor Alarm
- .2 Write
 - .1 Pump run,
 - .2 Pump stop,
 - .3 Generator run,
 - .4 Generator stop,
 - .5 Automatic transfer switch,
 - .6 Alarm reset,
 - .7 External existing building strobe
 - .8 Audible external building siren,
- .11 Note that all trending data currently available on the Building's BMS are to remain.

Part 3 Execution

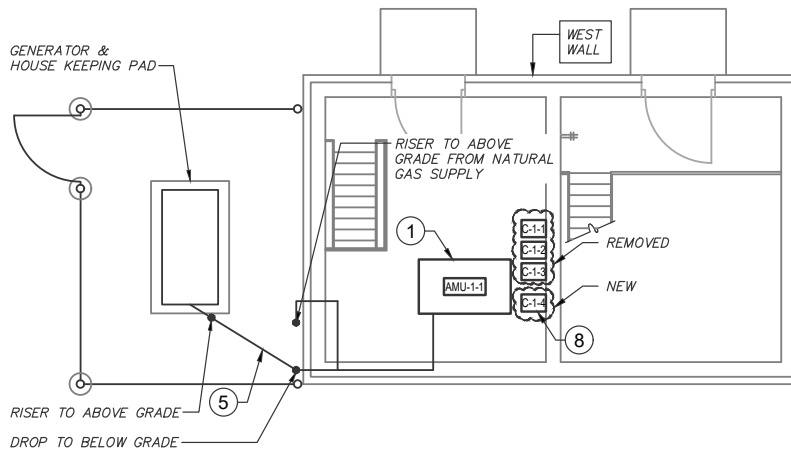
3.1 FIELD QUALITY CONTROL

- .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.

3.2 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.

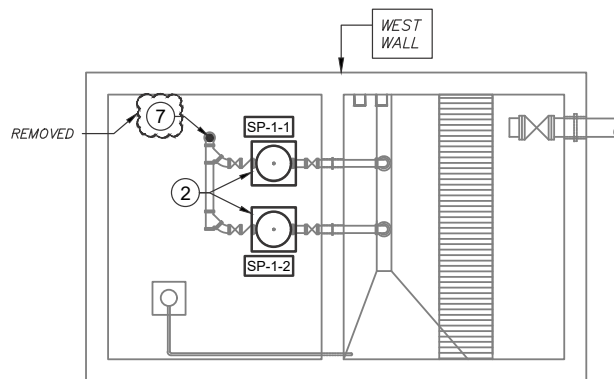
END OF SECTION



3
H101 1:100
SHEET REF. H101

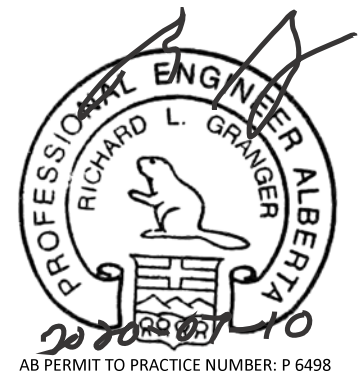
DETAIL - MAIN FLOOR

CONSTRUCTION NOTES	
TAG	CONSTRUCTION NOTE
①	NEW AIR MAKE-UP UNIT INSTALLED HIGH ABOVE FLOOR. CONNECT TO EXISTING GAS LINE. EXISTING HANGER TO BE REUSED IF NEW AMU ALLOWS. IF NOT FEASIBLE, CONTACT THE DEPARTMENTS REPRESENTATIVE PRIOR TO PROCEEDING.
②	NEW LIFT STATION PUMP. CONNECTED TO EXISTING PIPING.
③	NOTE REMOVED
④	NOTE REMOVED
⑤	NEW GAS LINE CONNECTED DIRECTLY AFTER METER REGULATOR. LINE TO BE BURIED IN TRENCH TO BUILDING. REFER TO CIVIL DRAWINGS FOR TYPICAL UTILITY SUPPLY TRENCH DETAILS.
⑥	NOTE REMOVED
⑦	NOTE REMOVED
⑧	NEW UNIFIED STATION CONTROL PANEL WITH INTEGRATE SENSORS FOR LIFT STATION OPERATION.



4
H101 1:100
SHEET REF. H101

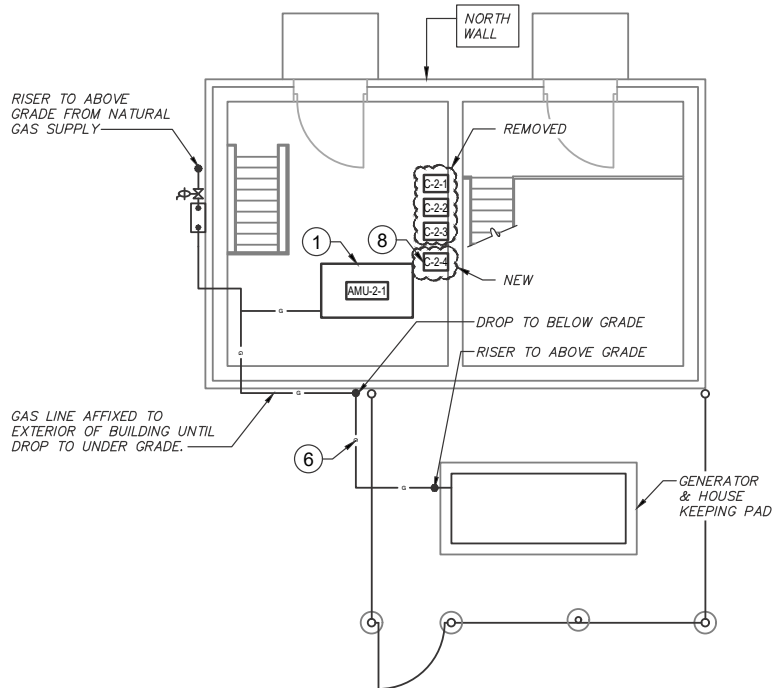
DETAIL - LOWER LEVEL



Project title
**LETHBRIDGE RESEARCH CENTRE
SEWER SYSTEM UPGRADE
5403 1ST AVE S, LETHBRIDGE, AB. T1J 4B1**

Drawing title
**MECHANICAL: LIFT STATION No.1
PIPING - NEW WORK
PLAN AND SECTION**

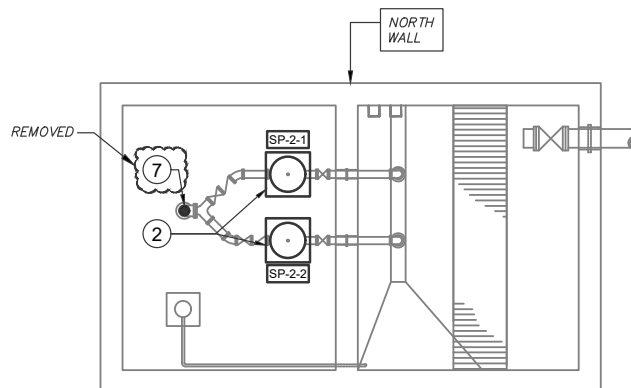
Drawn by JHW	PWGSC Project Manager GREG SPENCE, P. Eng., MBA		
Designed by DMD	Project no. R.097512.001		
Approved by RLG	Date 2020/07/10	Sheet ADD-1.1	Revision 0



CONSTRUCTION NOTES	
TAG	CONSTRUCTION NOTE
1	NEW AIR MAKE-UP UNIT INSTALLED HIGH ABOVE FLOOR. CONNECT TO EXISTING GAS LINE. EXISTING HANGER TO BE REUSED IF NEW AMU ALLOWS. IF NOT FEASIBLE, CONTACT THE DEPARTMENTS REPRESENTATIVE PRIOR TO PROCEEDING.
2	NEW LIFT STATION PUMP. CONNECTED TO EXISTING PIPING.
3	NOTE REMOVED
4	NOTE REMOVED
5	NOTE REMOVED
6	NEW GAS LINE CONNECTED DIRECTLY AFTER REGULATOR. LINE TO BE BURIED IN TRENCH TO BUILDING. REFER TO CIVIL DRAWINGS FOR TYPICAL UTILITY SUPPLY TRENCH DETAILS.
7	NOTE REMOVED
8	NEW UNIFIED STATION CONTROL PANEL WITH INTEGRATE SENSORS FOR LIFT STATION OPERATION.

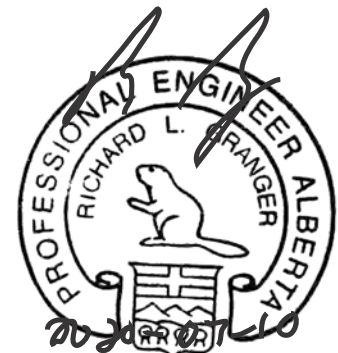
3 DETAIL - MAIN FLOOR

H102
1:100
SHEET REF. H102



4 DETAIL - LOWER LEVEL

H102
1:100
SHEET REF. H102

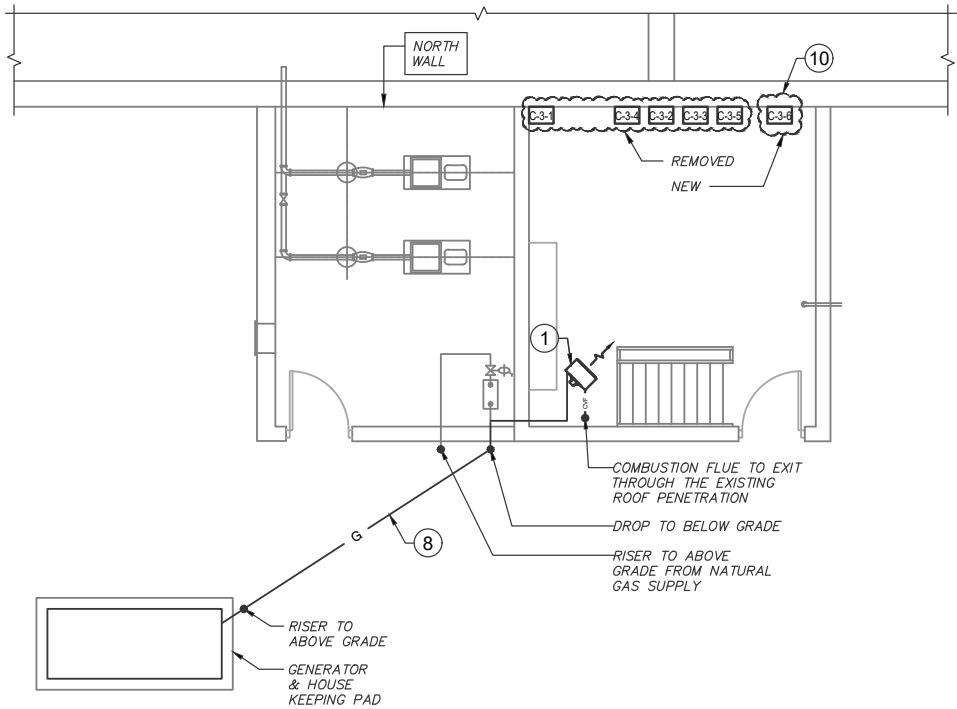


AB PERMIT TO PRACTICE NUMBER: P 6498

Project title
**LETHBRIDGE RESEARCH CENTRE
SEWER SYSTEM UPGRADE**
5403 1ST AVE S, LETHBRIDGE, AB. T1J 4B1

Drawing title
**MECHANICAL: LIFT STATION No. 2
PIPING - NEW WORK
PLAN AND SECTION**

Drawn by	JHW	PWGS Project Manager	GREG SPENCE, P. Eng., MBA
Designed by	DMD	Project no.	R.097512.001
Approved by	RLG	Date	2020/07/10
		Sheet	ADD-1.2
		Revision	0



4 **DETAIL - MAIN FLOOR**
H103 1:100
SHEET REF. H103

CONSTRUCTION NOTES	
TAG	CONSTRUCTION NOTE
①	NEW SEPARATED COMBUSTION UNIT HEATER, HUNG FROM CEILING USING EXISTING MOUNTING POINTS. IF NEW UNIT HEATER CANNOT UTILIZE EXISTING MOUNT LOCATION CONTACT DEPARTMENT REPRESENTATIVE PRIOR TO INSTALLATION.
②	NEW AGITATOR, TO BE INSTALLED USING EXISTING MOUNTING HARDWARE.
③	NOT REMOVED
④	NOTE REMOVED
⑤	NOTE REMOVED
⑥	NEW SEWAGE PUMPS.
⑦	NOTE REMOVED
⑧	NEW GAS LINE CONNECTED DIRECTLY AFTER METER REGULATOR. LINE TO BE BURIED IN TRENCH TO BUILDING. REFER TO CIVIL DRAWINGS FOR TYPICAL UTILITY SUPPLY TRENCH DETAILS.
⑨	NOTE REMOVED
⑩	NEW UNIFIED STATION CONTROL PANEL WITH INTEGRATE SENSORS FOR LIFT STATION OPERATION.

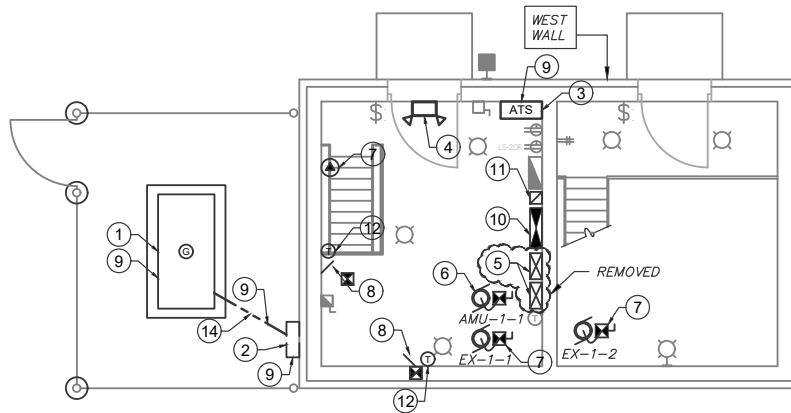
NEW



AB PERMIT TO PRACTICE NUMBER: P 6498

Project title	LETHBRIDGE RESEARCH CENTRE SEWER SYSTEM UPGRADE 5403 1ST AVE S, LETHBRIDGE, AB. T1J 4B1
Drawing title	MECHANICAL: LIFT STATION No. 3 PIPING - NEW WORK PLAN AND SECTION

Drawn by	JHW	PWGSC Project Manager GREG SPENCE, P. Eng., MBA		
Designed by	DMD	Project no. R.097512.001		
Approved by	RLG	Date 2020/07/10	Sheet ADD-1.3	Revision 0



3

DETAIL - MAIN FLOOR

E201

1:100
SHEET REF. E201

NOTE:
REFER TO SHEET ADD-1.5
FOR CONSTRUCTION NOTES.

ELECTRICAL LEGEND

ITEM	SYMBOL	REMARKS
SWITCH		
LIGHT FIXTURE, CEILING SURFACE MOUNTED		
EXTERIOR LIGHT FIXTURE, WALL MOUNTED		
EXTERIOR WALL PACK		
20A DUPLEX RECEPTACLE, c/w NEMA 4X COVER		
MOTOR, EQUIPMENT		
MOTOR DISCONNECT		
MAIN BREAKER DISCONNECT		
BREAKER SAFETY SWITCH		
POWER PANELBOARD		
COMBINATION MOTOR STARTER		SOFT STARTER
UNIFIED STATION CONTROL PANEL		MONITORING, BMS, PUMP CONTROL
MANUAL MOTOR STARTER SWITCH		
ENVIRONMENTAL CONTROLLER (FLOW METER OR LEVEL SWITCH)		
AUTOMATIC TRANSFER SWITCH		
GENERATOR		
THERMOSTAT		
UNDERGROUND WIRING IN CONDUIT		
EMERGENCY BATTERY PACK		2: 6W LED WITH BATTERY CAPACITY 36W FOR 120 MINUTES

REVISED

REMOVED

Project title

**LETHBRIDGE RESEARCH CENTRE
SEWER SYSTEM UPGRADE
5403 1ST AVE S, LETHBRIDGE, AB. T1J 4B1**

Drawing title

**ELECTRICAL: LIFT STATION No. 1
NEW WORK
PLAN AND SECTION**

Drawn by

JHW

Designed by

RM

Approved by

KAS



AB PERMIT TO PRACTICE NUMBER: P 6498

PWGSC Project Manager

GREG SPENCE, P. Eng., MBA

Project no.

R.097512.001

Date

2020/07/10

Sheet

ADD-1.4

Revision

0



CONSTRUCTION NOTES:

- ① PROVIDE, INSTALL, CONNECT, TEST AND COMMISSION THE NEW GENERATOR.
- ② PROVIDE AND INSTALL AN OUTDOOR-RATED GENERATOR TAP-BOX FOR MANUAL TRANSITION TO A MOBILE GENERATOR CONNECTION. MAKE ALL NECESSARY CONNECTIONS BETWEEN THE TAP-BOX AND GENERATOR.
- ③ INSTALL A NEW OPEN-TRANSITION AUTOMATIC TRANSFER SWITCH (ATS). PROVIDE ALL NEW NECESSARY POWER AND CONTROL CONNECTIONS BETWEEN THE UTILITY DISCONNECT AND EMERGENCY SUPPLY.
- ④ INSTALL NEW EMERGENCY BATTERY PACK IN DRY WELL.
- ⑤ NOTE REMOVED.
- ⑥ MAKE ALL ELECTRICAL CONNECTIONS AND WIRING FOR THE NEW AIR MAKE-UP UNIT. PROVIDE ALL NEW CONTROL WIRING AND INTERLOCKS AS REQUIRED BY THE MECHANICAL DRAWINGS.
- ⑦ MAKE ALL ELECTRICAL CONNECTIONS AND WIRING FOR THE NEW CONTROL DAMPER ACTUATOR MOTOR AND EXHAUST FANS.
- ⑧ INSTALL NEW MANUAL MOTOR STARTER SWITCHES WITH PILOT LIGHTS AND LOCKING MECHANISM. MAKE ALL ASSOCIATED ELECTRICAL CONNECTIONS AND WIRING.
- ⑨ EXCAVATE AND PREPARE A TRENCH. INSTALL ALL NEW ASSOCIATED CABLES AND GAS LINES FOR THE GENERATOR POWER CONDUCTORS AND THE GENERATOR CONTROL CONDUCTORS. PROVIDE PVC CONDUIT FOR FACILITATING THE INSTALLATION OF CABLES. MAKE ALL NECESSARY CONNECTIONS BETWEEN THE GENERATOR, TRANSFER SWITCH, AND OUTDOOR TAP-BOX TO ACHIEVE A FULLY FUNCTIONAL BACK-UP POWER SYSTEM. PROVIDE ALL NEW CABLES AND CONDUCTORS.
- ⑩ MAKE ALL NEW ELECTRICAL CONNECTIONS FROM THE NEW UNIFIED STATION CONTROL PANEL AND SPECIFICATIONS SECTION 26.29.03 TO ASSOCIATED SENSORS/DEVICES, AS INDICATED ON THE MECHANICAL PLANS. REVISED
- ⑪ INSTALL TWO NEW SOFT-START MOTOR STARTER CABINETS COMPLETE WITH INTEGRAL OVERCURRENT PROTECTION, SHORT CIRCUIT PROTECTION AND ASSOCIATED CONTROL DEVICES. INSTALL ALL NEW HARDWARE, WIRING, AND CONDUIT TO COMPLETE THE EXISTING CONNECTIONS.
- ⑫ INSTALL AND MAKE CONNECTIONS FOR NEW THERMOSTATS ASSOCIATED WITH EXHAUST FANS, CONTROL DAMPERS, AND AMU. SEE MECHANICAL DRAWINGS FOR SPECIFICATIONS AND REQUIREMENTS.
- ⑬ PROVIDE NEW ELECTRICAL WIRING AND CONNECTIONS TO THE NEW SEWAGE PUMPS. INSTALL NEW LOCAL DISCONNECTS ADJACENT TO THE PUMPS. TRANSITION FROM TECK90 CABLE TO FLEXIBLE EQUIPMENT CABLE AS PER THE FEEDER SCHEDULE. CORE AND SLEEVE PENETRATIONS THROUGH THE FLOOR AS REQUIRED.
- ⑭ PROVIDE ELECTRICAL CONDUIT FROM THE NEW GENERATOR TO THE EXISTING LIFT STATION. A MINIMUM OF THREE CONDUITS ARE TO BE PROVIDED IN SIZES OF 50mm, 50mm AND 75mm, FOR BOTH POWER AND CONTROL RESPECTIVELY. CONDUIT SIZE AND QUANTITY TO BE COORDINATED WITH PURCHASED GENERATOR SPECIFICATIONS. REFER TO PAGE C301 WITHIN THE CIVIL DRAWINGS FOR BEDDING AND TRENCHING INFORMATION.

Project Name: LeDRC Sewer Lift Station Upgrades										Project Number: 1020-042																																											
<table><tr><td>120/208</td><td>:</td><td>VOLTS</td></tr><tr><td>3</td><td>:</td><td>PHASE</td></tr><tr><td>4</td><td>:</td><td>WIRES</td></tr><tr><td>18663</td><td>:</td><td>WATTS</td></tr></table>						120/208	:	VOLTS	3	:	PHASE	4	:	WIRES	18663	:	WATTS	<table><tr><td colspan="2">PANEL BOARD:</td></tr><tr><td colspan="2">LIFT STATION #1</td></tr><tr><td colspan="2">EXISTING</td></tr></table>						PANEL BOARD:		LIFT STATION #1		EXISTING		<table><tr><td colspan="2">BUS :</td><td>225A</td></tr><tr><td colspan="2">FEEDER :</td><td>ATS</td></tr><tr><td colspan="2">MAIN BR. :</td><td>N/A</td></tr><tr><td colspan="2">AMPS :</td><td>52</td></tr></table>						BUS :		225A	FEEDER :		ATS	MAIN BR. :		N/A	AMPS :		52	Federal Pioneer NBLP24B-4LI Type NBLP					
120/208	:	VOLTS																																																			
3	:	PHASE																																																			
4	:	WIRES																																																			
18663	:	WATTS																																																			
PANEL BOARD:																																																					
LIFT STATION #1																																																					
EXISTING																																																					
BUS :		225A																																																			
FEEDER :		ATS																																																			
MAIN BR. :		N/A																																																			
AMPS :		52																																																			
DESCRIPTION		VA	LIGHT	REC	OTHER	CIR.	BRK.	A	B	C	BRK.	CIR.	OTHER	REC	LIGHT	VA	DESCRIPTION																																				
Sewage Pump #1 SP-1-1		6016			1	1	30	●			15	2	1			120	Unified Station Control Panel																																				
						3	3P	●			15	4					Spare																																				
						5	3P	●			15	6					Spare																																				
Sewage Pump #2 SP-1-2		6016			1	7	30	●			15	8			4	200	Lighting & Emergency Battery Pack																																				
						9	3P	●			15	10			4	200	Lighting																																				
						11	3P	●			20	12		1		120	Receptacle																																				
Control Dampers CD-1-1, CD-1-2		120			2	13	15	●			15	14	1			120	Alarms, Light & Horn																																				
AMU-1-1		900			1	15	15	●			15	16	2				Exhaust Fans - Existing																																				
Battery Charger		120			1	17	15	●			2P	18																																									
Receptacle		120	1					●			15	20	1			745	Exhaust Fan EX-2-1 - Dry Well																																				
Generator Control Panel		3000			1	21	60	●			15	22	1			745	Exhaust Fan EX-2-2 - Wet Well																																				
						23	2P	●			20	24		1		120	Receptacle - L5-20R																																				
		16293														2370																																					

Project title

**LETHBRIDGE RESEARCH CENTRE
SEWER SYSTEM UPGRADE
5403 1ST AVE S, LETHBRIDGE, AB. T1J 4B1**

Drawing title

**ELCTRICAL: LIFT STATION No. 1
NEW WORK
PLAN AND SECTION**

Drawn by

JHW

Designed by

RM

Approved by

KAS

PWGS Project Manager

GREG SPENCE, P. Eng., MBA

Project no.

R.097512.001

Date

2020/07/10

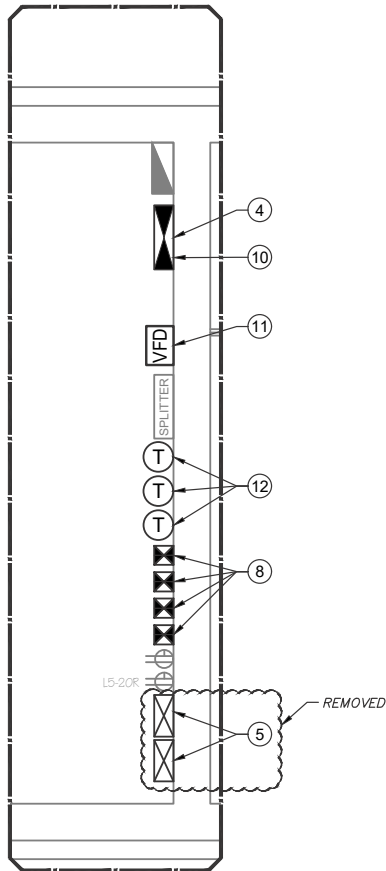
Sheet

ADD-1.5

Revision

0





ELECTRICAL LEGEND		
ITEM	SYMBOL	REMARKS
SWITCH, 120V, 15A		
LIGHT FIXTURE, CEILING SURFACE MOUNTED, 20W LED		HAZARDOUS LOCATION, CLASS 1, DIVISION 2
EXTERIOR LIGHT FIXTURE, WALL MOUNTED, 20W LED		HAZARDOUS LOCATION, CLASS 1, DIVISION 2
EXTERIOR WALL PACK		
20A DUPLEX RECEPTACLE, c/w NEMA 4X COVER		
20A DUPLEX RECEPTACLE, TWIST LOCKING		NEMA L5-20R CONFIGURATION
MOTOR, EQUIPMENT		
MOTOR DISCONNECT		
EQUIPMENT CONNECTION		
MAIN BREAKER DISCONNECT		
POWER PANELBOARD		
UNIFIED STATION CONTROL PANEL		MONITORING, BMS, PUMP CONTROL
MANUAL MOTOR STARTER SWITCH		
ENVIRONMENTAL CONTROLLER (FLOW METER OR LEVEL SWITCH)		
AUTOMATIC TRANSFER SWITCH		ATS
GENERATOR		
THERMOSTAT		
VARIABLE FREQUENCY DRIVE		
SPLITTER		
UNDERGROUND WIRING IN CONDUIT		
EMERGENCY BATTERY PACK		2: 6W LED WITH BATTERY CAPACITY 36W FOR 120 MINUTES

REVISED

REMOVED

NOTE:
REFER TO SHEET ADD-1.7
FOR CONSTRUCTION NOTES.

5

ENLARGED DETAIL

E202

1:40
SHEET REF. E202



Project title

**LETHBRIDGE RESEARCH CENTRE
SEWER SYSTEM UPGRADE
5403 1ST AVE S, LETHBRIDGE, AB. T1J 4B1**

Drawing title

**ELECTRICAL: LIFT STATION No. 2
NEW WORK
PLAN AND SECTION**

Drawn by

JHW

PWGSC Project Manager

GREG SPENCE, P. Eng., MBA

Designed by

RM

Project no.

R.097512.001

Approved by

KAS

Date

2020/07/10

Sheet

ADD-1.6

Revision

0



CONSTRUCTION NOTES:

- ① PROVIDE, INSTALL, CONNECT, TEST AND COMMISSION THE NEW GENERATOR.
- ② PROVIDE AND INSTALL AN OUTDOOR-RATED GENERATOR TAP-BOX FOR MANUAL TRANSITION TO A MOBILE GENERATOR CONNECTION. MAKE ALL NECESSARY CONNECTIONS BETWEEN THE TAP-BOX, GENERATOR, AND AUTOMATIC TRANSFER SWITCH.
- ③ INSTALL A NEW OPEN-TRANSITION AUTOMATIC TRANSFER SWITCH (ATS). PROVIDE ALL NEW NECESSARY POWER AND CONTROL CONNECTIONS BETWEEN THE UTILITY DISCONNECT AND EMERGENCY SUPPLY.
- ④ INSTALL A NEW UNIFIED STATION CONTROL PANEL. MAKE NEW CONNECTIONS TO EXISTING DEVICES AND INSTALL ALL LOW-VOLTAGE CONTROLS AS REQUIRED FROM THE MECHANICAL EQUIPMENT SCOPE.
- ⑤ NOTE REMOVED.
- ⑥ MAKE ALL ELECTRICAL CONNECTIONS AND WIRING FOR THE NEW AIR MAKE-UP UNIT. PROVIDE ALL NEW CONTROL WIRING AND INTERLOCKS AS REQUIRED BY THE MECHANICAL DRAWINGS.
- ⑦ MAKE ALL ELECTRICAL CONNECTIONS AND WIRING FOR THE NEW CONTROL DAMPER ACTUATOR MOTOR AND EXHAUST FANS.
- ⑧ INSTALL NEW MANUAL MOTOR STARTER SWITCHES WITH PILOT LIGHTS AND LOCKING MECHANISM. MAKE ALL ASSOCIATED ELECTRICAL CONNECTIONS AND WIRING.
- ⑨ EXCAVATE AND PREPARE A TRENCH. INSTALL ALL NEW ASSOCIATED CABLES FOR THE GENERATOR POWER CONDUCTORS AND THE GENERATOR CONTROL CONDUCTORS. PROVIDE PVC CONDUIT FOR FACILITATING THE INSTALLATION OF CABLES. MAKE ALL NECESSARY CONNECTIONS BETWEEN THE GENERATOR, TRANSFER SWITCH, AND OUTDOOR TAP-BOX TO ACHIEVE A FULLY FUNCTIONAL BACK-UP POWER SYSTEM. PROVIDE ALL NEW CABLES AND CONDUCTORS.
- ⑩ MAKE ALL NEW ELECTRICAL CONNECTIONS FROM THE NEW UNIFIED STATION CONTROL PANEL TO ASSOCIATED SENSORS/DEVICES, AS INDICATED ON THE MECHANICAL PLANS AND SPECIFICATIONS SECTION 26.29.03.
- ⑪ INSTALL TWO NEW VFD MOTOR START CABINETS C/W PROGRAMMABLE DISPLAY, HOA AND EXTERIOR DISCONNECT MECHANISM. INSTALL ALL NEW ASSOCIATED HARDWARE, WIRING, AND CONDUIT, AND INSTALL ALL NEW CONNECTIONS TO THE PUMPS AND DEVICES.
- ⑫ INSTALL AND MAKE CONNECTIONS FOR NEW THERMOSTATS ASSOCIATED WITH EXHAUST FANS, CONTROL DAMPERS, AND AMU. SEE MECHANICAL DRAWINGS FOR SPECIFICATIONS AND REQUIREMENTS.
- ⑬ INSTALL NEW COPPER TECK90 CABLES AND WET-COUPLING CONNECTORS TO REPLACE ALL EXISTING CORRODED WIRING INSTALLATIONS IN THE WET-WELL.
- ⑭ PROVIDE AND INSTALL A NEW LIGHT SWITCH THAT IS RATED FOR A ZONE 2 HAZARDOUS ENVIRONMENT (CLASS 1 DIVISION 2)
- ⑮ PROVIDE AND INSTALL NEW LED LIGHT FIXTURES RATED FOR A ZONE 2 HAZARDOUS ENVIRONMENT (CLASS 1 DIVISION 2)
- ⑯ PROVIDE NEW ELECTRICAL WIRING AND CONNECTIONS TO THE NEW SEWAGE PUMPS. INSTALL NEW LOCAL DISCONNECTS ADJACENT TO THE PUMPS. TRANSITION FROM TECK90 CABLE TO FLEXIBLE EQUIPMENT CABLE AS PER THE FEEDER SCHEDULE. CORE AND SLEEVE PENETRATIONS THROUGH THE FLOOR AS REQUIRED.
- ⑰ INSTALL NEW EMERGENCY BATTERY PACK IN DRYWELL.
- ⑱ PROVIDE ELECTRICAL CONDUIT FROM THE NEW GENERATOR TO THE EXISTING LIFT STATION. A MINIMUM OF THREE CONDUITS ARE TO BE PROVIDED IN SIZES OF 50mm, 50mm AND 75mm, FOR BOTH POWER AND CONTROL RESPECTIVELY. CONDUIT SIZE AND QUANTITY TO BE COORDINATED WITH PURCHASED GENERATOR SPECIFICATIONS. REFER TO PAGE C302 WITHIN THE CIVIL DRAWINGS FOR BEDDING AND TRENCHING INFORMATION.

REVISED

REVISED



AB PERMIT TO PRACTICE NUMBER: P 6498

Project Name: LeDRC Sewer Lift Station Upgrades										Project Number: 1020-042																																				
<table><tr><td>120/240</td><td>:</td><td>VOLTS</td></tr><tr><td>1</td><td>:</td><td>PHASE</td></tr><tr><td>3</td><td>:</td><td>WIRES</td></tr><tr><td>5070</td><td>:</td><td>WATTS</td></tr></table>						120/240	:	VOLTS	1	:	PHASE	3	:	WIRES	5070	:	WATTS	<table><tr><td>PANEL BOARD:</td></tr><tr><td>LIFT STATION #2</td></tr><tr><td>EXISTING</td></tr></table>				PANEL BOARD:	LIFT STATION #2	EXISTING	<table><tr><td>BUS :</td><td>225A</td></tr><tr><td>FEEDER :</td><td>7.5kVA XFMR</td></tr><tr><td>MAIN BR. :</td><td>N/A</td></tr><tr><td>AMPS :</td><td>21</td></tr></table>				BUS :	225A	FEEDER :	7.5kVA XFMR	MAIN BR. :	N/A	AMPS :	21	Federal Pioneer NVLP24B-3LI Type NBLP									
120/240	:	VOLTS																																												
1	:	PHASE																																												
3	:	WIRES																																												
5070	:	WATTS																																												
PANEL BOARD:																																														
LIFT STATION #2																																														
EXISTING																																														
BUS :	225A																																													
FEEDER :	7.5kVA XFMR																																													
MAIN BR. :	N/A																																													
AMPS :	21																																													
<div>A</div> <div>B</div>																																														
DESCRIPTION						VA	LIGHT	REC	OTHER	CIR.	BRK.	DESCRIPTION																																		
Receptacle - Dry Well						120		1		1	15	Exhaust Fan EX-2-2 - Wet Well																																		
Lighting - Dry Well						200	4			3	15	Exhaust Fan EX-2-1 - Dry Well																																		
Lighting - Wet Well						200	4			5	15	Duct Heater																																		
Receptacle - Exterior						120		1		7	15	Control Damper CD-2-1																																		
Unified Station Control Panel						120				1	15	AMU-2-1																																		
Spare										11	15	Battery Charger																																		
Spare										13	15	Alarms - Horn & Light																																		
Blank											15	EX-2-3																																		
Blank										17		Receptacle - LS-20R																																		
Blank										19		Generator Control Panel																																		
Blank										21		Blank																																		
Blank										23																																				
						760																																								
							4310																																							

REVISED

Project title

**LETHBRIDGE RESEARCH CENTRE
SEWER SYSTEM UPGRADE
5403 1ST AVE S, LETHBRIDGE, AB. T1J 4B1**

Drawing title

**ELECTRICAL: LIFT STATION No. 2
NEW WORK
PLAN & SECTION**

Drawn by

JHW

PWGSC Project Manager

GREG SPENCE, P .Eng., MBA

Designed by

RM

Project no.

R.097512.001

Approved by

KAS

Date

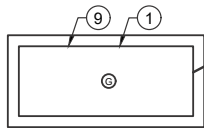
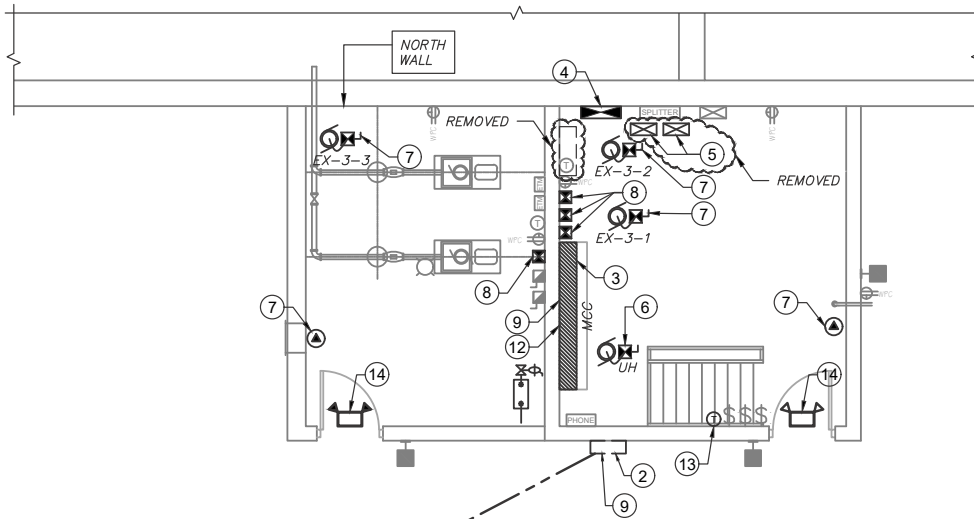
2020/07/10

Sheet

ADD-1.7

Revision

0



DETAIL - MAIN FLOOR

1:100
SHEET REF. E203



AB PERMIT TO PRACTICE NUMBER: P 6498

NOTE:
REFER TO SHEET ADD-1.9
FOR CONSTRUCTION NOTES.

ELECTRICAL LEGEND

ITEM	SYMBOL	REMARKS
SWITCH		
LIGHT FIXTURE, CEILING SURFACE MOUNTED		
EXTERIOR LIGHT FIXTURE, WALL MOUNTED		
EXTERIOR WALL PACK		
20A DUPLEX RECEPTACLE, c/w NEMA 4X COVER		
20A DUPLEX RECEPTACLE, TWIST LOCKING		NEMA L5-20R CONFIGURATION
MOTOR, EQUIPMENT		
EQUIPMENT CONNECTION		
BREAKER SAFETY SWITCH		
UNIFIED STATION CONTROL PANEL		MONITORING, BMS, PUMP CONTROL
MANUAL MOTOR STARTER SWITCH		
ENVIRONMENTAL CONTROLLER (FLOW METER OR LEVEL SWITCH)		
GENERATOR		
THERMOSTAT		
SPLITTER/CABLE TROUGH		
MOTOR CONTROL CENTER (MCC)		
ELAPSED TIME METER		
UNDERGROUND WIRING IN CONDUIT		
TELEPHONE CABINET		
EMERGENCY BATTERY PACK		2: 6W LED WITH BATTERY CAPACITY 36W FOR 120 MINUTES
EMERGENCY BATTERY PACK		2: 6W LED WITH BATTERY CAPACITY 36W FOR 30 MINUTES

Project title

LETHBRIDGE RESEARCH CENTRE SEWER SYSTEM UPGRADE

5403 1ST AVE S, LETHBRIDGE, AB. T1J 4B1

Drawing title

ELECTRICAL: LIFT STATION No. 3 NEW WORK PLAN AND SECTION

Drawn by

JHW

PWGSC Project Manager

GREG SPENCE, P. Eng., MBA

Designed by

RM

Project no.

R.097512.001

Approved by

KAS

Date

2020/07/10

Sheet

ADD-1.8

Revision

0



CONSTRUCTION NOTES:

- ① PROVIDE, INSTALL, CONNECT, TEST AND COMMISSION THE NEW GENERATOR.
- ② PROVIDE AND INSTALL AN OUTDOOR-RATED GENERATOR TAP-BOX FOR MANUAL TRANSITION TO A MOBILE GENERATOR CONNECTION. MAKE ALL NECESSARY CONNECTIONS BETWEEN THE TAP-BOX, GENERATOR, AND AUTOMATIC TRANSFER SWITCH INTEGRAL TO THE MCC.
- ③ PROVIDE ALL NEW NECESSARY POWER AND CONTROL CONNECTIONS BETWEEN THE UTILITY AND EMERGENCY SUPPLY TO THE MCC'S INTEGRAL SERVICE DISCONNECT AND INTEGRAL ATS.
- ④ **INSTALL A NEW UNIFIED STATION CONTROL PANEL. MAKE NEW CONNECTIONS TO EXISTING DEVICES AND INSTALL ALL LOW-VOLTAGE CONTROLS AS REQUIRED FROM THE MECHANICAL EQUIPMENT PLANS AND SPECIFICATIONS SECTION 26.29.03.**
- ⑤ NOTE REMOVED.
- ⑥ MAKE ALL ELECTRICAL CONNECTIONS AND WIRING FOR THE NEW GAS UNIT HEATER. PROVIDE ALL NEW CONTROL WIRING AND INTERLOCKS AS REQUIRED BY THE MECHANICAL DRAWINGS.
- ⑦ MAKE ALL ELECTRICAL CONNECTIONS AND WIRING FOR THE NEW CONTROL DAMPER ACTUATOR MOTOR AND EXHAUST FANS.
- ⑧ INSTALL NEW MANUAL MOTOR STARTER SWITCHES WITH PILOT LIGHTS AND LOCKING MECHANISM. MAKE ALL ASSOCIATED ELECTRICAL CONNECTIONS AND WIRING.
- ⑨ EXCAVATE AND PREPARE A TRENCH. INSTALL ALL NEW ASSOCIATED CABLES FOR THE GENERATOR POWER CONDUCTORS AND THE GENERATOR CONTROL CONDUCTORS. PROVIDE PVC CONDUIT FOR FACILITATING THE INSTALLATION OF CABLES. MAKE ALL NECESSARY CONNECTIONS BETWEEN THE GENERATOR, MCC TRANSFER SWITCH, AND OUTDOOR TAP-BOX TO ACHIEVE A FULLY FUNCTIONAL BACK-UP POWER SYSTEM. PROVIDE ALL NEW CABLES AND CONDUCTORS.
- ⑩ PROVIDE ALL NEW ELECTRICAL WIRING AND CONNECTIONS TO THE NEW SEWAGE PUMPS. INSTALL NEW LOCAL DISCONNECTS ADJACENT TO THE PUMPS. TRANSITION FROM TECK90 CABLE TO FLEXIBLE EQUIPMENT CABLE AS PER THE FEEDER SCHEDULE.
- ⑪ MAKE ALL ELECTRICAL CONNECTIONS FOR THE NEW AGITATOR MOTORS.
- ⑫ PROCURE AND INSTALL A NEW MOTOR CONTROL CENTER. MCC TO BE CONFIGURED TO MATCH THE LAYOUT OF THE EXISTING MCC. MCC TO BE PROVIDED WITH VFD DRIVES FOR EACH OF THE SIX PUMPS, IN LIEU OF EXISTING VVVR STARTERS. MCC TO BE PROVIDED WITH CONTROL CABINET, DIGITAL METERING, SURGE SUPPRESSION DEVICE, INTEGRAL TRANSFORMER AND PANELBOARD AS PER SPECIFICATIONS. VFD BUCKETS TO BE HEAVY-DUTY RATED AND BE PROVIDED WITH MODBUS COMMUNICATIONS, CAPABILITY, EXTERNAL HMI, AND INTEGRAL LINE AND LOAD REACTORS AS PER SPECIFICATIONS. MAKE ALL EXISTING CONNECTIONS. PROVIDE NEW CONDUIT, CONDUCTORS AND BOXES TO EXTEND OR RUN NEW CONNECTIONS TO ALL EQUIPMENT AND DEVICES. PROVIDE NEW CONDUCTORS TO THE SEWAGE PUMPS. CORE AND SLEEVE PENETRATIONS THROUGH THE FLOOR AS REQUIRED.
- ⑬ INSTALL AND MAKE CONNECTIONS FOR NEW THERMOSTATS ASSOCIATED WITH EXHAUST FANS, CONTROL DAMPERS, AND UNIT HEATER. SEE MECHANICAL DRAWINGS FOR SPECIFICATIONS AND REQUIREMENTS.
- ⑭ INSTALL NEW EMERGENCY BATTERY PACK IN DRYWELL LOCATIONS.
- ⑮ PROVIDE ELECTRICAL CONDUIT FROM THE NEW GENERATOR TO THE EXISTING LIFT STATION. A MINIMUM OF THREE CONDUITS ARE TO BE PROVIDED IN SIZES OF 50mm, 50mm AND 75mm, FOR BOTH POWER AND CONTROL RESPECTIVELY. CONDUIT SIZE AND QUANTITY TO BE COORDINATED WITH PURCHASED GENERATOR SPECIFICATIONS. REFER TO PAGE C303 WITHIN THE CIVIL DRAWINGS FOR BEDDING AND TRENCHING INFORMATION.

REVISED

Project Name: LeDRC Sewer Lift Station Upgrades

Project Number: 1020-042

120/208 : VOLTS					PANEL BOARD:					BUS : 100A									
3 : PHASE					LIFT STATION #3					FEEDER : MCC									
4 : WIRES					NEW					MAIN BR : N/A									
4775 : WATTS										AMPS : 13									
DESCRIPTION	VA	LIGHT	REC	OTHER	CIR.	BRK.	A	B	C	BRK.	CIR.	OTHER	REC	LIGHT	VA	DESCRIPTION			
Exhaust Fan - EX-3-1, Damper	865				2	1	15	●		15	2	2			865	Exhaust Fan - EX-3-2 Damper			
Lighting - Blower Room, Exterior	300				6	3	15	●		15	4			6	300	Lighting - Pump Room			
Receptacle - Blower Room	120		1			5	15	●		15	6		1		120	Receptacle - Main Floor			
Exhaust Fan - EX-3-3, Damper	865				2	7	15	●		15	8		1		120	Receptacle - Lower Floor			
Control Circuit	120				1	9	15	●		15	10		1		120	Receptacle - Exterior			
Space Trickle Charger	120				1	11	15	●		15	12	1			190	Unit Heater UH-3-1			
Metering Circuit	120				1	13	15	●		15	14					Spare			
Spare							15	●		2P	16								
Spare							17	15	●	15	18	1			190	Air Make-Up Unit			
Unified Station Control Panel	120						19	15	●	15	20	1			120	Block Heater			
Spare							21	15	●	60	22	1			120	Generator Control Panel			
Spare							23	15	●	2P	24								
Spare							25	15	●	20	26					Spare			
Spare							27	15	●	20	28					Spare			
Spare							29	15	●	20	30					Spare			
2630							2145												



AB PERMIT TO PRACTICE NUMBER: P 6498

Project title

**LETHBRIDGE RESEARCH CENTRE
SEWER SYSTEM UPGRADE
5403 1ST AVE S, LETHBRIDGE, AB. T1J 4B1**

Drawing title

**ELECTRICAL: LIFT STATION No. 3
NEW WORK
PLAN AND SECTION**

Drawn by

JHW

PWGSC Project Manager

GREG SPENCE, P. Eng., MBA

Designed by

RM

Project no.

R.097512.001

Approved by

KAS

Date

2020/07/10

Sheet

ADD-1.9

Revision

0