

Addendum/Addenda

No./N° 1

Project Description / Description de projet U66 room 003 electrical upgrade		
Solicitation No./ N° de sollicitation 16-22101	Project No./N° de projet 5280	W.O. No./N° d'ordre de travail A1-006434-01
Departmental Representative / Représentant Ministériel Maurice Richard	Date Nov 1, 2016	
Notice: This addendum shall form part of the tender documents and all conditions shall apply and be read in conjunction with the original plans and specifications.		Nota: Cet addenda fait partie intégrale des dossiers d'appel d'offres; toutes les conditions énoncées doivent être lues et appliquées en conjonction avec les plans et les devis originaux.

1. New equipment in phase 3 c/w all associated materials are required to be delivered to site before March 15, 2017.
2. Store new equipment in NRC building U62, contractor provides transportation of equipment from U62 to job site.
3. Spec 001000, delete 8.1.2
4. Spec 001000, 12.4 is revised as “ An escort may be required whenever working outside normal hours. Contractor to bear the associated costs for escorts except for required contractual shutdowns.”
5. Spec 001000, 15.2, replace “approval date “ with “reviewal date”.



Part 1 General

1.1 RELATED WORK

- .1 Section 260500 - Common Work Results – Electrical
- .2 Section 262400 – Low Voltage Service Entrance Switchboard

1.2 WORK OUTLINE

- .1 The work in this section includes fabrication, assembly, delivery, installation, field assembly, connection, supervision of related trades, on-site testing, commissioning and warranty of the systems components, as outlined in this specification and as indicated on the drawings.
- .2 Installation, assembly, and field connections include all interconnecting power, control and instrumentation wiring to terminals within the system.
- .3 Programming and commissioning of Control Systems, HMI and Power Monitoring System.
- .4 Manufacturer certified service representative to provide start up, commissioning and training for each system.

1.3 OPERATIONS AND MAINTENANCE DATA

- .1 Provide separately bound operation and maintenance manual for the HMI system.
- .2 Include:
 - .1 Complete set of approved shop drawings.
 - .2 Parts list with catalogue numbers for all components.
 - .3 Operation and maintenance instructions for each component and for the complete system.
 - .4 Schematic diagrams, indicating all interconnections between equipment.
 - .5 Detailed wiring diagrams for all wiring within the control system, including power, control, instrumentation, and communications. Ensure all wiring numbers are unique and logically assigned.
 - .6 Narrative overview of the complete systems sequence of operation, including all interrelationships with other systems, devices and controls.
 - .7 Certified copy of set up, testing, and commissioning results.
 - .8 Complete set of as-built drawings in both paper and electronic form (.PDF and .DWG).
 - .9 Complete set of control and programming files for all digital devices in both paper and electronic form (.PDF and the file's native formats).
 - .10 All software, licensing and source code required for PLC controller and HMI.
- .3 Two copies of the manuals listed above shall be submitted prior to Demonstration and Training.

1.4 INSTRUCTION

- .1 Instructions shall only take place after testing and commissioning of the systems is completed, and all operation and maintenance data is submitted to the satisfaction of the Engineer. The Contractor shall provide the services of qualified service representatives for the following training:
 - .1 A minimum period of 2 hours to instruct the owner's operating personnel in the correct operation and maintenance of the HMI system.

1.5 SITE TESTING AND COMMISSIONING

- .1 Bench test before equipment arrived on site.
- .2 Engineer must be notified two weeks prior to any testing.
- .3 Prepare testing procedure and schedule indicating all tests to be performed. Submit to Engineer for review three weeks before testing.
- .4 Test and commission system components and submit to the Engineer a detailed list of sequence of operation indicating test had been verified. At completion of testing and commissioning, duplicate all procedures in the presence of the Engineer. Correct all noted deficiencies to the satisfaction of the Engineer.
- .5 Test and commission the control and instrumentation equipment and demonstrate the overall performance of the complete system in the presence of the Engineer.
- .6 As a minimum, the following steps are required during the testing and commissioning period.
 - .1 Submit typed testing and commissioning forms customized for every typical type of device applied within the system for review by the Engineer. Forms to be modified to the satisfaction of the Engineer.
 - .2 Testing and commissioning shall not commence until all systems are fully operational.
 - .3 Test and commission the system components and complete all forms noted above, and submit to the Engineer for review. All forms shall be included in the final submission of the operation and maintenance manuals.
 - .4 After all of the systems have been satisfactorily commissioned, repeat all testing and commissioning procedures in the presence of the Engineer.

1.6 SHOP DRAWINGS

- .1 Shop drawings to include, but not limited to:
 - .1 Control and instrumentation equipment
 - .2 Enclosure type and dimensions
 - .3 Description of alarm functions
 - .4 Description of control functions

- .5 Set-point description
 - .6 System schematic showing interconnection of all components
 - .7 Installation drawings and diagrams indicating all interconnections between equipment. Drawing shall include identification numbers for all terminal blocks in all equipment. This shall also be submitted in electronic form.
 - .8 All electronic files for the PLC including ladder logic, annotation files, and any other files required for communication with the HMI system shall be supplied.
- .2 Each shop drawing submission shall include a cover letter identifying all changes and deviations from contract drawings and specifications.
- .1 If shop drawings comply fully with contract documents, Contractor shall state “This shop drawing submission complies fully with contract drawings and specifications”.

1.7 CO-ORDINATION

- .1 Installation of instrumentation and control equipment to be coordinated with the work of other trades to ensure proper installation and wiring.

1.8 TENDER DRAWINGS

- .1 The purpose of the drawings is to show the general requirements for the control system and general overview of the method of implementing the specified sequence of operation. It should be used only as a general guide for the design of the control systems. The contractor may use any other method for implementing the specified sequence of operation, subject to the requirements of this specification and shop drawing review. The Contractor is responsible to provide a control system that will execute the specified sequence of operation.

1.9 HMI SYSTEM DESCRIPTION

- .1 HMI system must be capable of performing the following monitoring, and actions via Ethernet communication with remote modules:
 - .1 The HMI will communicate with the following devices:
 - .1 All 600V trip units on service entrance switchboard via Modbus TCP
 - .2 All 600V breaker on service entrance switchboard open and close command via Modbus TCP protocol
 - .3 All 2.4kV protective relays via Modbus TCP protocol
 - .4 All 2.4V breakers and switches open and close command via Modbus TCP protocol
 - .2 The HMI will display either a complete single line drawing of all 2.4kV breakers and switches in the contract and all 600V breakers on the service entrance switchboard.
 - .3 HMI must show the current status of the 2.4kV breakers, switches and all breakers on main service entrance switchboard on the single line page(s) as either “open”, “closed”, or “tripped”. Status should be conveyed to the reader of the HMI by way of a text description and diagrammatically on the single line by showing an open or closed breaker or switch with an appropriate colour (red for closed, green for open, amber for tripped).
 - .4 HMI must display the real time current, for each breaker in the 2.4kV breakers and 600V breakers on service entrance switchboard on the single line page(s).
 - .5 HMI system must be capable of opening and closing the 2.4kV breakers, 2.4kV switches and 600V breakers on service entrance switchboard through the HMI’s

touch screen display. The HMI must be programmed such that the operation of the breakers can only be performed after the appropriate password is inputted into the HMI, and after a clear query from the system and confirmation from the user that the specific breaker is to be operated or not.

- .6 HMI system must maintain a time stamped alarm log of all breaker, switch, and relay operations from operator and relay/trip units.
- .7 The system must include all required interfacing and auxiliaries, such as wiring, conduit, I/O interfacing, etc.

Part 2 Products

2.1 HUMAN MACHINE INTERFACE (HMI) AND CONTROLLER

- .1 The HMI interface may either be an integrated minimum 12” touchscreen display with built-in controls or a minimum 12” touchscreen display with separately DIN-rail mounted PLC controller.
- .2 Equipped with 8-port industrial grade Ethernet switch interconnected with HMI/ PLC.
- .3 The system is powered by external 120VAC, provide power supply as required by system.
- .3 Approved manufacturers:
 - .1 Siemens
 - .2 Schneider
 - .3 Rockwell/Allan Bradley
 - .4 GE

Part 3 Execution

3.1 WIRING AND TERMINATION

- .1 Switchgear and switchboard network to HMI and PLC controller communication must be through Ethernet communication.

3.2 INSTALLATION AND VERIFICATION

- .1 Install, calibrate, and connect equipment in accordance with manufacturer’s instructions.
- .2 Provide and install all interconnecting wiring.
- .3 All equipment shall be factory assembled and tested prior to shipping.
- .4 Perform on-site system verification and final calibration.
- .5 The contractor shall certify that the installation has been completed in accordance with their instructions.

END OF SECTION

6. Provide protection coordination and arc flash study to new switchboard, panels and MCCs, apply protective setting based on the report.
7. Provide HMI/PLC system to remote control main switchboard.
 - Supply, program and commission HMI system as per spec 260950
 - Locate HMI at at south east corner of rm.003 as per E04/1
 - Provide 120VAC emergency power to HMI/PLC system
 - Provide Cat 6 cable with RJ 45 connector in EMT from HMI/PLC system to main switchboard
 - Material must be delivered before March 15, 2017
8. Provide lamicaid identification for each 600V molded case breaker.
9. To clarify, the symmentric short circuit interrupting capacity is :
PD1, PD2, P9 : 25KA@600V, LD8 : 100KA @ 208V