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BuildingName
The Description of the Project
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SPECIFICATION DIVISION 26

NUMBER SECTION DESCRIPTION

DIVISION 26 ELECTRICAL
SECTION 261102 - INSTALLATION OF PRE-PURCHASED UNIT SUBSTATIONS

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DIVISION 26 ELECTRICAL
SECTION 261102 - INSTALLATION OF PRE-PURCHASED UNIT SUBSTATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. The University of Michigan will pre-purchase an indoor, metal-clad, unit substation assembly consisting of primary voltage switch, transformer, and secondary voltage switchgear sections. The unit substation assembly shall be received, handled and properly stored, as needed and installed, tested and activated by this Contractor.

1.2 RELATED SECTIONS

A. The drawings and the general provisions of the contract, including the current edition of the University of Michigan Standard General Conditions, apply to this section.

B. The applicable requirements of the Division 1 and other Division 26 specification sections apply to this section.

PART 2 - PRODUCTS

2.1 INSTALLATION HARDWARE

A. All necessary hardware to secure the assembly in place shall be provided by the installing Contractor.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

A. The substation's Manufacturer is providing the services of a qualified factory-trained Manufacturer's representative to assist the installing Contractor in the installation and start-up of the equipment specified under this section for a period of two (2) working days.

B. The substation's Manufacturer has provided to the Owner a line item cost for each additional day of the factory-trained Manufacturer's representative services that may be required, for up to a total of seven (7) days.

C. The Manufacturer's representative shall provide technical direction and assistance to the contractor in general assembly of the equipment, connections and adjustments, and testing of the assembly and components contained herein.

D. The installing Contractor shall provide three (3) copies of the Manufacturer's field start-up report.

3.2 INSTALLATION

A. Accept delivery of new unit substation and, if necessary, store unit in a heated, secure building.

B. Co-ordinate with the Owner's Representative for an independent inspection of the delivered substation assemblies. The University will hire and pay an independent agency to inspect the delivered substation sections and to verify that all specifications and drawing requirement of the pre-purchase package have been met.

C. The same independent agency will perform the overall commissioning of the installed substation and all their services will be paid by the University. The installing contractor shall coordinate and facilitate the commissioning tasks.

EDIT AND/OR REMOVE PARAGRAPH, IF BREAK-DOWN IS NOT REQUIRED IN A PARTICULAR PROJECT.

D. Under the direction of Manufacturer's field representative, break down the unit substation's transformer by removing the enclosure and the secondary bus from the transformer assembly. This is necessary to clear the existing low clearance of _____ inches vertically inside the building.

EDIT AND/OR REMOVE PARAGRAPH IF BREAK-DOWN IS NOT REQUIRED IN YOUR PARTICULAR PROJECT.

E. The Manufacturer's field representative shall supervise the reassembly of the transformer at the final installation site.

EDIT AND/OR REMOVE PARAGRAPH IF TILTING OR LOW POINTS ARE NOT REQUIRED OR ARE NOT RELEVANT IN YOUR PARTICULAR PROJECT.

F. Ensure that all necessary extra bracing and tools required are in place, so that the primary switches and secondary sections can be transported tilted as necessary, so they can pass under the low point of the travel path of _____ inches within the building.

G. Remove secondary breakers from their compartments, before transporting secondary sections to the substation room.

H. Re-install secondary breakers in their compartments, after installing secondary sections to the substation room.

EDIT AND/OR REMOVE PARAGRAPH IF THERE IS NO ROUTING DRAWING REQUIRED IN YOUR PARTICULAR PROJECT.

I. Consult Drawings regarding the proposed routing of the unit substation.

J. The Contractor shall install all equipment per the Manufacturer’s recommendations and per contract drawings.

K. Provide a 4 inch thick minimum concrete housekeeping pad for the substation. Size and shape the pad in accordance with the approved substation shop drawings. Pad shall not extend more than four (4) inches beyond the substation footprint. Pad shall include embedded steel leveling channels that are level to within 1/8 inch per three (3) feet. Leveling channels shall have a 1/8 inch reveal above the top of the concrete. The quantity, size and locations of leveling channels shall be in accordance with Manufacturer’s recommendations.

L. Anchor the unit substation to the concrete housekeeping pad using concrete anchors.

M. Install fuses, set the temperature monitor, and circuit breaker trip units in accordance with the short circuit and coordination studies, the Owner’s directions, and the Manufacturer’s instructions.

N. Provide temporary heaters in accordance with the Manufacturer's instructions until the substation is energized.

O. Arrange for testing and setting of the unit substation devices in accordance with these specifications, applicable codes and standards, and Manufacturer's instructions. The University will supply breaker settings and transformer primary fuse size.

P. The substation sections shall be installed and checked in accordance with the Manufacturer’s recommendations. This shall include but not limited to:

1. Checking to ensure that the pad location is level to within 1/8 inch per three feet of distance in any direction.
2. Checking to ensure that all bus bars are torqued to the Manufacturer’s recommendations.
3. Assembling all shipping sections, removing all shipping braces and connecting all shipping split mechanical and electrical connections.
4. Measuring and recording Megger readings phase-to-phase, phase-to-ground, and neutral-to-ground (four wire systems only).
5. Inspecting and installing all circuit breakers in their proper compartments.

Q. Adjust taps to deliver appropriate secondary voltage.

R. Confirm operation using primary current injection method.

S. Measure primary and secondary voltages for proper tap settings.

T. Megger primary and secondary windings.

U. Assist the University’s Plant High Voltage Shop and Commissioning Authority with substation testing, start-up and commissioning activities.

3.3 MANUFACTURER'S CERTIFICATION

A. A qualified factory-trained Manufacturer's representative shall certify in writing that the equipment has been installed, adjusted and tested in accordance with the Manufacturer's recommendations. **These services have been purchased under the substation's pre-purchase agreement, by the University.**

B. Provide three (3) copies of the Manufacturer's representative's certification.

3.4 TRAINING

A. A Manufacturer's qualified representative shall conduct two training sessions. **These services have been purchased under the substation's pre-purchase agreement, by the University.**

B. The installing Contractor shall arrange and coordinate the two training sessions, for up to fifteen (15) Owner's Representatives. Each session shall last 4 hours and shall be conducted during normal workdays at a jobsite location determined by the owner. These training sessions shall take place BEFORE the start-up of the new substation.

1. One training program shall be of the "start-up" type and shall include instructions on the assembly, including primary equipment, transformer, and secondary equipment. All circuit breakers, protective devices and other major components shall be included.
2. A second training program shall be focused on the maintenance of the unit substation, including primary equipment, transformer, and secondary equipment. All circuit breakers, protective devices and other major components shall be included.

3.5 PRIOR TO SHIPPING

A. Approximately 7 days prior to shipment of the unit substation components, the local representative of the manufacturer shall meet with the U-M design manager (electrical engineer), as well as other designated U-M stakeholders at the U-M A&E office complex. The purpose of the meeting will be to participate in a conference telephone call to the factories where the substation components are being assembled. The local representative shall coordinate with the factories to ensure that an authorized and qualified factory representative is available (at all sites) who will be able to discuss in detail the U-M assembly. Items such as shop drawing comments, etc. shall be discussed and verified during the telephone conference calls. Under no circumstance may the components be shipped prior to the telephone verifications.

END OF SECTION 16314