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BuildingName
The Description of the Project
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SPECIFICATION DIVISION 26

NUMBER SECTION DESCRIPTION

DIVISION 26 ELECTRICAL
SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL

END OF CONTENTS TABLE

DIVISION 26 ELECTRICAL
SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

INCLUDE PARAGRAPH 1.1.A AND B IN EVERY SPECIFICATION SECTION. EDIT RELATED SECTIONS 1.1.B TO MAKE IT PROJECT SPECIFIC.

A. Drawings and general provisions of the Contract, Standard General and Supplementary General Conditions, Division 01 Specification Sections, and other applicable Specification Sections, in particular the Related Sections listed below, apply to this Section.

IN 1 BELOW, SELECT PROPER COMMISSIONING SPEC SECTION NUMBER APPLICABLE TO THE PROJECT.

B. Related Sections:

1. Section 019100/019110 - Commissioning
2. Section 017823 - Operation and Maintenance Manual
3. Section 260513 - Medium, Low & Control Voltage Cables
4. Section 260526 - Grounding and Bonding for Electrical
5. Section 260533 - Electrical Materials and Methods

1.2 SUMMARY

A. Provide all equipment, materials, labor and services necessary to furnish, install, test and turn over to the Owner the following electrical work as required by these specifications and as shown on the drawings, including all shop drawings, test reports, record drawings, operations and maintenance manuals, Owner training and incidental items necessary to complete the project in every respect.

B. Participate in project coordination, scheduling and commissioning activities as specified in Division 01.

1.3 REFERENCES

A. Provide equipment and materials that conform to the applicable standards of the following organizations:

1. American National Standards Institute (ANSI).
2. Institute of Electrical and Electronic Engineers (IEEE).
3. National Electrical Manufacturers Association (NEMA).
4. National Fire Protection Association (NFPA).
5. Telecommunications Industry Organization/Electronic Industries Alliance (TIA/EIA)

B. All materials and equipment shall be listed and labeled by Underwriters Laboratories (UL), Electrical Testing Laboratories (ETL), MET Laboratories (MET), or the Canadian Standards Association (CSA).

C. Install equipment and materials in compliance with the following:

1. Michigan Electrical Code (MEC).
2. Michigan Building Code (MBC).
3. Michigan Mechanical Code (MMC).
4. Michigan Plumbing Code (MPC).
5. Americans with Disabilities Act (ADA).
6. State of Michigan DLEG Bureau of Fire Services.
7. Owner's Inspection Authorities.
8. Manufacturers' instructions.

1.4 DESIGN DOCUMENTS

A. Contact the Owner's Representative about design questions and discrepancies between design documents before performing the work.

B. Notify the Owner's Representative if existing code violations are uncovered that are not addressed in the design documents.

1.5 SUBMITTALS

A. Submit for approval copies of shop drawings and product literature for the following equipment. Submittals shall include adequate information to prove that the systems, equipment and materials comply with the contract documents. Each copy of the submittals shall be marked to indicate the specific models, sizes, types and options being provided. Submittals not so marked will be rejected.

DELETE ITEMS NOT PART OF THE PROJECT. ADD ITEMS AS NECESSARY.

1. Primary Equipment and Unit Substations.
2. Generator and Uninterruptible Power Supply Systems.
3. Distribution Transformers.
4. Power Distribution, Lighting, and Receptacle Panels.
5. Motor Control Centers, Starters and Motor Controls.
6. Disconnect and Safety Switches.
7. Lighting Contactors.
8. Capacitors.
9. Bus Ducts and Bus Duct Plugs.
10. Wiring Devices.
11. Transient Voltage Surge Suppresser Devices.
12. Lighting Fixtures.
13. Lighting Control Systems, Dimmer Systems and Switches.
14. Timers and Time Switches.
15. Fire Alarm Systems.
16. Clocks and Clock Systems.
17. Security and Card Access Control Systems.
18. Sound Reinforcement Systems.
19. Intercom and Public Address Systems.
20. Closed Circuit TV Systems.
21. Manholes and Duct Bank Spacers.
22. Cable Trays.
23. Conduits and Fittings.
24. Cables, Wires and Terminations.
25. Grounding Connections.

B. Participate in the coordination drawing process and submit coordination drawings for approval in accordance with Division 01.

1.6 RECORD DOCUMENTS

A. Submit record drawings in electronic format (AutoCAD or Microstation) for approval as specified in Division 01. Show the locations of equipment, light fixtures, switches, receptacles and junction boxes, riser information, the sizes of conduits and conductors, circuit numbers, and deviations from the design. Dimension the locations of buried, embedded and concealed primary and feeder conduits from permanent building features.

1.7 OPERATIONS AND MAINTENANCE MANUALS

A. Submit for approval copies of operations and maintenance manuals as specified in Division 01 and the other Division 26, 27 and 28 sections. Each copy of the manuals shall be marked to indicate the specific models, sizes, types and options of the systems and equipment that were provided. Manuals not so marked will be rejected.

1.8 QUALITY ASSURANCE

A. Electrical work shall be performed by licensed Journeyman or registered Apprentice Electricians. The number of Apprentices on a project shall not exceed the number of Journeymen. Electricians shall carry a copy of their license or registration while working on The Owner’s projects.

B. Contact the Owner’s Code Inspection Department (734-764-2457) before starting the project to arrange for periodic inspections. Normal inspections will be performed at no cost to the Contractor, but the costs for repeat re-inspections of rejected work may be deducted from the Contractor’s final payment.

1.9 SHIPPING, HANDLING AND STORAGE

A. For deliveries of equipment to the Owner, notify the Owner’s Representative of the deliveries 3 working days in advance. Deliveries shall occur on normal workdays between 8:00 AM and 2:00 PM. Deliveries that arrive without adequate notice may be rejected.

B. Provide unloading and storage for Owner furnished equipment that is shipped to the project site.

C. Pick up, transport and unload at the project site Owner furnished equipment that is stored in the Owner’s warehouses.

D. Provide packaging Waste management in accordance with Division 1.

1.10 WARRANTY

A. Guarantee work for a period of one year from the date of the Owner's final acceptance of the project (Substantial Completion). A manufacturer’s warranty beginning upon equipment receipt or startup shall be extended to one year from final project acceptance. A manufacturer’s warranty in excess of one year shall remain in effect for its entire time period.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 SUBSTITUTIONS

A. Provide equipment and materials from the manufacturers specified. Substitutions for specified products are acceptable only if proposed and approved in writing at the time of bid.

3.2 TEMPORARY SERVICE

DELETE NEXT SENTENCE IF THE PROJECT IS PAYING FOR THE ELECTRICITY. DELETE PARAGRAPH 1 BELOW IF THE UNIVERSITY IS PAYING FOR THE ELECTRICITY)

A. Provide, maintain and remove all temporary lighting and power required to complete the project. If used reasonably, the Owner will pay for the electricity consumed.

1. Provide an Owner approved watthour meter and box. Coordinate with the Plant High Voltage Shop (734 764-9445) and submit a Utilities Services Request for circuit energization.

B. Provide ground fault protection on temporary feeders rated 200 amps and larger.

C. Temporary feeders shall be limited to the following types:

1. Conductors installed in raceways.
2. NEC Type MC cable.
3. Multi-conductor cable with an overall outer jacket (where inaccessible to the public and not subject to damage or abuse).
4. NEC recognized hard usage cord or extra hard usage cord (where inaccessible to the public and not subject to damage or abuse).

D. Install and support temporary wiring in accordance with the NEC requirements for permanent wiring.

E. Label temporary power feeders every 25 feet maximum.

F. Temporary wiring may either be copper or aluminum.

3.3 ELECTRICAL COORDINATION

A. Participate in the project scheduling and coordination drawing activities specified in Division 01 of the project specifications.

B. Coordinate power interruptions with the other disciplines in accordance with Division 01. Notify the Owner’s Representative of power interruptions 3 working days in advance. Maintain power to all loads outside of the work area.

C. Coordinate with the Plant Operations Call Center 10 working days in advance at (734) 647-2059:

1. Before performing any work affecting primary power distribution circuits, unit substations or outdoor lighting.

2. Before performing any work affecting engine-generators, automatic transfer switches or variable speed drives.
3. Before performing any work affecting fire alarm, security or card access control systems.
4. Before performing any work affecting telecommunications ducts, manholes, rooms or circuits.
5. Before performing any work affecting roofs.

D. Notify OSEH at (734) 647-1143 before starting up engine-generators.

3.4 DEMOLITION

A. Protect adjacent building services and materials indicated to remain. Install and maintain barriers to keep dirt, dust and noise from being transmitted to adjacent areas. Remove protection and barriers after demolition is completed.

B. Remove all equipment and materials designated for demolition as follows:

1. Power wiring - remove back to the source or to the first junction box where the circuit continues on to remaining loads.
2. Telecommunications wiring - remove from conduits and J-hooks back to cable trays or to the outer walls of the building entrance (BE) room or telecommunications rooms (TRs).
   a. Cut and label wire ends "Abandoned" when abandoning sections of wires in cable trays and at BE and TR outer walls. Do not remove telecommunications wiring from cable trays, the BE or the TRs.
   b. Coordinate for the Telecommunications Installation Contractor to remove abandoned wiring from cable trays and inside the BE and TRs.
3. Conduits and boxes in walls and above permanent ceilings - abandon in place. Install blank cover plates on boxes.
4. Conduits through floors and walls, and boxes in floors - remove completely. Patch and paint penetrations to match existing.
5. Exposed and accessible conduits, wireways and boxes - remove completely. Patch and paint surfaces to match existing, and plug unused panel and junction box holes.
6. Lighting fixtures and electrical equipment - remove and dispose of completely (unless designated for relocation).

3.5 LAMP AND BALLAST RECYCLING

A. Recycle tubular fluorescent, compact fluorescent, HID, LED, induction and cold cathode lamps removed during demolition or replaced during construction. These six types of lamps shall not be disposed of as solid waste.

1. Package unbroken tubular fluorescent lamps in their original cardboard boxes, or contact OSEH Hazardous Materials Management at (734) 647-1142 and arrange to pick up U-lamp, 60 lamp, 100 lamp or 250 lamp boxes at the North Campus Transfer Facility located at 1655 Dean Road. Package unbroken compact fluorescent, HID, LED, induction and cold cathode lamps in appropriately sized corrugated cardboard boxes.
    a. Use separate boxes for each type and physical size of lamp. Do not mix lamp types or sizes in the same box.
    b. Fill the boxes as completely as possible.
2. Obtain Universal Waste Labels from OSEH. Fill out and attach one label to each box.
    a. Enter the building name, quantity of lamps, and the accumulation start date (date the box started to be filled).
    b. Mark the appropriate check box to indicate the type and length of lamps.
3. Tape the boxes closed on all sides.
4. Sweep up any broken lamps and seal them in a heavy plastic bag. Place the plastic bag in a corrugated cardboard box and tape the box closed on all sides. Label the box to indicate the type and quantity of broken lamps inside. Notify OSEH of the broken lamps.
5. Contact the OSEH Hazardous Materials Management at (734) 763-4568 and arrange to deliver the sealed and labeled boxes to the storage area at the Campus Safety Services Building located at 1239 Kipke Drive. Take care to avoid breaking the lamps. Position the boxes on their sides during transport. Do not stack anything on top of the boxes.
6. If lamps inside a box become broken, seal the entire box in a heavy plastic bag. Copy the Universal Waste Label information onto a new label and attach the new label to the outside of the plastic bag.
7. Place the boxes into the designated storage area. Position the boxes on their sides so that the labels are forward and visible. Do not stack the boxes more than three high (two high for 250 lamp boxes). OSEH will recycle the lamps at no cost to the Contractor.

B. Recycle fluorescent, HID and cold cathode lighting ballasts removed during demolition. Recycle LED and induction lighting drivers removed during demolition. Lighting ballasts and drivers shall not be disposed of as solid waste.

1. Contact OSEH Hazardous Materials Management at (734) 763-4568 and arrange to pick up DOT approved 30 gallon steel drums and 5 gallon pails at the North Campus Transfer Facility located at 1655 Dean Road.
2. Place the drums in an accessible location and on a hard surface so that OSEH can use a drum cart to pick them up later. Lawns, dirt piles, gravel drives, muddy areas and basements without elevators are not considered accessible locations.
3. Wearing rubber gloves, deposit any leaking ballasts into the 5 gallon pails for separate handling. When finished, deposit the rubber gloves into the 5 gallon pails.

4. Deposit the non-leaking ballasts and drivers into the 30 gallon drums. Leave enough space at the top of the drums for installation of lids.
5. Obtain Universal Waste Labels from OSEH. Fill out and attach one label to each 5 gallon pail and each 30 gallon drum. Enter the building name, quantity of ballasts and drivers, and the accumulation start date (date the pail or drum started to be filled).
6. Contact OSEH at least 3 working days in advance to request pick-up of the pails and drums. OSEH will pick up and recycle the ballasts and drivers at no cost to the Contractor.
7. Do not deposit ballasts from other projects or any other refuse in the drums. All costs for disposing of foreign items found in the drums will be deducted from the Contractor’s final payment.

3.6 RELOCATION

A. Carefully remove, clean and restore items designated for relocation to a “like new” condition, and store them for reuse.

3.7 SALVAGE

A. Equipment and materials removed during demolition, unless noted otherwise, shall become the property of the contractor with due consideration for all such removed equipment included in the bid price.

3.8 CLEANUP

A. Remove and legally dispose of demolished items, rubbish and debris from the construction site daily, and at the completion of the work. Failure to do so may result in the cleanup being performed by others and all costs thereof being deducted from the Contractor’s final payment.

3.9 EQUIPMENT PROTECTION

A. Protect equipment and materials during shipment, storage and construction against damage and contamination.

B. Items that become damaged or contaminated shall be restored to a “like new” condition or replaced at the Contractor’s expense.

3.10 WORK PERFORMANCE

A. Locate equipment as close as practical to the locations shown on the drawings. Should field conditions prevent the installation of equipment or materials as indicated on the drawings, make any deviations only with the prior approval of the Owner’s Representative.

B. Install and connect new work to existing work neatly and carefully. Existing work that is disturbed shall be repaired or replaced as necessary to restore it to its prior condition.

C. Coordinate work with the other trades to ensure completion consistent with the project schedule. Do not unduly delay the startup, testing or turnover of project systems.

D. Coordinate work with the other trades to ensure the NEC-required dedicated spaces above and working spaces around electrical equipment is provided, and to ensure access to equipment requiring calibration or maintenance. Working space and access shall be sufficient for an adult to perform maintenance safely without straddling or removing obstructions. Work that encroaches on working space or that impedes maintenance shall be relocated at the Contractor's expense.

E. Coordinate work with the other trades to provide access doors to maintainable electrical equipment (including lighting fixture remote ballasts) located behind walls or above permanent ceilings.

F. Prior to core drilling concrete floors, test for the presence of electrical conduits. Use an impulse induction type scanner capable of detecting both metallic conduits and copper wires in PVC conduits. Tracers that scan for energized cables or that scan for injected high frequency signals are not acceptable. Notify the Owner’s Inspection Department prior to all tests. Prior to core drilling, arrange for the Owner’s Representative to notify building occupants of the potential for an unscheduled power outage. Conduits damaged during core drilling shall be restored immediately at the Contractor’s expense.

3.11 EQUIPMENT AND WIRING IDENTIFICATION AND COLOR CODING

A. Provide nameplates indicating equipment names or numbers and power sources as specified in Section 260533.

B. Paint fire alarm system and temperature controls system junction boxes and covers as specified in Section 260533.

C. Mark junction box covers with the panel and breaker numbers of the circuits contained within as specified in Section 260533.

D. Provide Arc-Flash labels at all substations, switchboards, panelboards, motor control devices, and other power equipment as specified in Section 260533.

E. Color code and identify wiring in accordance with Section 260513.

3.12 FIELD QUALITY CONTROL

A. Arrange for testing and commissioning of electrical systems, equipment and materials prior to final acceptance of the work. Acceptance tests and commissioning shall be performed as specified in Division 01 and the other Division 26, 27 and 28 sections, and in applicable codes, standards and manufacturers’ instructions.

B. Provide all test equipment, materials and labor necessary to perform the tests, and coordinate with the other trades for necessary services, such as scaffolding and the uncoupling of motors.

C. Notify the Owner’s Representative 3 working days in advance of tests. The Owner shall witness the tests unless the Owner’s Representative waives such witnessing in writing.

D. Notify manufacturers sufficiently in advance of tests for which the manufacturers should be present.

E. Replace any equipment or materials found to be defective or found to be of lesser quality than that specified or shown on the drawings.

F. Provide written test reports, signed and dated, for all tests prior to acceptance of the electrical equipment by the Owner.

G. Provide the training specified in each specification section.

END OF SECTION 260500