SECTION 26 05 00

**COMMON WORK RESULTS FOR ELECTRICAL**

**BASED ON DFD MASTER ELECTRICAL SPEC DATED 12/26/23**

This section has been written to cover most (but not all) situations that you will encounter. Depending on the requirements of your specific project, you may have to add material, delete items, or modify what is currently written. The Division of Facilities Development expects changes and comments from you.

**PART 1 - GENERAL**

The electrical work included in all other divisions is the responsibility of the contractor performing the division 26 work unless noted otherwise.

**PROJECT OVERVIEW**

***Note to A/E: Describe to the bidding contractors the major electrical work involved on the project***

**SCOPE**

The work under this section includes basic electrical requirements, which are applicable to all Division 26 sections. This section includes information common to two or more technical specification sections or items that are of a general nature, not conveniently fitting into other technical sections. Included are the following topics:

PART 1 - GENERAL

Project Overview

Scope

Related Work

Reference Standards

Regulatory Requirements

Quality Assurance

Continuity of Existing Services and Systems

Protection of Finished Surfaces

Approved Electrical Testing Laboratories

Sleeves and Openings

Sealing and Fire Stopping

State and/or User Agency Furnished Equipment

Work by State and/or User Agency

Provisions for Future Work

Intent

Omissions

Submittals

Project/Site Conditions

Work Sequence and Scheduling

Work by Other Trades

Offsite Storage

Salvage Materials

Certificates and Inspections

Operating and Maintenance Data

Record Drawings

PART 2 - PRODUCTS

Access Panels and Doors

Identification

Sealing and Fire Stopping

 PART 3 - EXECUTION

Excavation and Backfill

Concrete Work

Cutting and Patching

Building Access

Equipment Access

Coordination

Sleeves and Openings

Sealing and Fire Stopping

Housekeeping and Clean Up

Agency Training

RELATED WORK

Applicable provisions of Division 1 govern work under this Section.

Section 01 91 01 or 01 91 02 – Commissioning Process

Section 07 84 00 – Fire Stopping

**REFERENCE STANDARDS**

Abbreviations of standards organizations referenced in this and other sections are as follows:

 ***Edit this list to agree with the specification sections that are actually used.***

ANSI American National Standards Institute

ASTM American Society for Testing and Materials

EPA Environmental Protection Agency

ETL Electrical Testing Laboratories, Inc.

IEEE Institute of Electrical and Electronics Engineers

IES Illuminating Engineering Society

ISA Instrument Society of America

NBS National Bureau of Standards

NEC National Electric Code

NEMA National Electrical Manufacturers Association

NESC National Electrical Safety Code

NFPA National Fire Protection Association

NRTL Nationally Recognized Testing Laboratory

UL Underwriters Laboratories Inc.

DSPS Wisconsin Department of Safety and Professional Services

**REGULATORY REQUIREMENTS**

All work and materials are to conform in every detail to applicable rules and requirements of the Wisconsin State Electrical Code (SPS 316), the National Electrical Code (NFPA 70), other applicable National Fire Protection Association codes, the National Electrical Safety Code, and present manufacturing standards (including NEMA).

All Division 26 work shall be done under the direction of a currently licensed State of Wisconsin Master Electrician.

All Division 26 work shall comply with SPS 101.862 and SPS 305.40 for electrical wiring integral with pre-manufactured structures.

**QUALITY ASSURANCE**

Where equipment or accessories are used which differ in arrangement, configuration, dimensions, ratings, or engineering parameters from those indicated on the contract documents, the contractor is responsible for all costs involved in integrating the equipment or accessories into the system and the assigned space, and for obtaining the performance from the system into which these items are placed.

Manufacturer references used herein are intended to establish a level of quality and performance requirements unless more explicit restrictions are stated to apply.

All materials, shall be listed by and shall bear the label of an approved Nationally Recognized Testing Laboratory (NRTL) as identified by the United States Occupational Safety and Health Administration (OSHA), per the OSHA Nationally Recognized Testing Laboratory Program. If none of the approved electrical testing laboratories has published standards for a particular item, then other national independent testing standards, if available, applicable, and approved by DFD, shall apply and such items shall bear those labels. Where one of the approved electrical testing laboratories has an applicable system listing and label, the entire system, shall be so labeled.

***The following shall be included for projects involving Medium Voltage cable, Medium Voltage equipment or components.***

[Project staff shall have experience in the coordination and procurement of medium voltage cable, medium voltage equipment and components used on this project.

A minimum of two electricians working on this project shall be trained and experienced (completed minimum of 2 similar medium voltage installations) with medium voltage cable, medium voltage equipment and components.

Electricians involved in splicing and termination of cables shall be trained and experienced in the procedures required for the splices and terminations used on this project.

At the discretion of the Engineer, documentation of training and experience in medium voltage installations shall be provided.]

**CONTINUITY OF EXISTING SERVICES AND SYSTEMS**

No outages shall be permitted on existing systems except at the time and during the interval specified by the user agency and by the DFD Project Representative. The institution may require written approval. Any outage must be scheduled when the interruption causes the least interference with normal institutional schedules and business routines. No extra costs will be paid to the Contractor for such outages which must occur outside of regular weekly working hours.

This Contractor shall restore any circuit interrupted as a result of this work to proper operation as soon as possible. Note that institutional operations are on a seven-day week schedule.

***The consultant is expected to discuss the interruption of any service with the user agency and/or occupants of the building, prior to the bid, to determine how these changes can best be made. If work is required on weekends, nights, or holidays, this must be indicated in the specifications and/or on the drawings.***

**PROTECTION OF FINISHED SURFACES**

Furnish one can of touch-up paint for each different color factory finish furnished by the Contractor. Deliver touch-up paint with other "loose and detachable parts" as covered in the General Requirements.

**APPROVED ELECTRICAL TESTING LABORATORIES**

The following laboratories are approved for providing electrical product safety testing, listing and labeling services as required in these specifications:

A Nationally Recognized Testing Laboratory (NRTL) as identified by the United States Occupational Safety and Health Administration (OSHA), per the OSHA Nationally Recognized Testing Laboratory Program.

**SLEEVES AND OPENINGS**

Refer to Division 1, General Requirements, Sleeves and Openings.

**SEALING AND FIRE STOPPING**

Sealing and fire stopping of sleeves/openings between conduits, cable trays, wireways, troughs, cablebus, busduct, etc. and the sleeve, structural or partition opening shall be the responsibility of the contractor whose work penetrates the opening. Provide all fire stopping of fire rated penetrations and sealing of smoke rated penetrations in compliance with section 07 84 00 Fire Stopping.

**STATE AND/OR USER AGENCY FURNISHED EQUIPMENT**

***This article is intended to alert the Contractor that the user agency will be furnishing some equipment that will have to be received, stored, installed, and/or which will need final connections for the completed project. In some cases, it may be appropriate to refer to other sections for a more complete description of the equipment being furnished or the work involved in installation.***

**WORK BY STATE AND/OR USER AGENCY**

***This article is intended to alert the Contractor that the user agency will be performing some work necessary for the completed project and the Contractor is to coordinate with this work.***

PCB equipment (other than light fixture ballasts) removal and disposal, if required, will be by the DFD under separate contract.

Electrical testing not described in these contract documents will be by the DFD under separate contract.

**PROVISIONS FOR FUTURE WORK**

***Explain what systems or subsystems have been provided or sized for future expansion and what the Contractor must do to maintain these provisions. This article is not needed if equipment is the only item that has been sized for the future, if the future capacity of that equipment is indicated on schedules, and if no other work is required of the contractor for this future provision.***

**INTENT**

The Contractor shall furnish and install all the necessary materials, apparatus, and devices to complete the electrical equipment and systems installation herein specified, except such parts as are specifically exempted herein.

If an item is either called for in the specifications or shown on the plans, it shall be considered sufficient for the inclusion of said item in this contract. If a conflict exists within the Specifications or exists within the Drawings, the Contractor shall furnish the item, system, or workmanship, which is the highest quality, largest, or most closely fits the DFD's intent (as determined by the DFD Project Manager). Refer to the General Conditions of the Contract for further clarification.

It must be understood that the details and drawings are diagrammatic. The Contractor shall verify all dimensions at the site and be responsible for their accuracy.

All sizes as given are minimum except as noted.

Materials and labor shall be new (unless noted or stated otherwise), first class, and workmanlike, and shall be subject at all times to the DFD's and/or A/E's inspections, tests and approval from the commencement until the acceptance of the completed work.

Whenever a particular manufacturer's product is named, it is intended to establish a level of quality and performance requirements unless more explicit restrictions are stated to apply.

**OMISSIONS**

No later than ten (10) days before bid opening, the Contractor shall call the attention of the DFD to any materials or apparatus the Contractor believes to be inadequate and to any necessary items of work omitted.

**SUBMITTALS**

Submit for all equipment and systems as indicated in the respective specification sections, marking each submittal with that specification section number. Mark general catalog sheets and drawings to indicate specific items being submitted and proper identification of equipment by name and/or number, as indicated in the contract documents. Failure to do this may result in the submittal(s) being returned to the Contractor for correction and resubmission. Failing to follow these instructions does not relieve the Contractor from the requirement of meeting the project schedule.

On request from the DFD, the successful bidder shall furnish additional drawings, illustrations, catalog data, performance characteristics, etc.

Submittals shall be grouped to include complete submittals of related systems, products, and accessories in a single submittal. Mark dimensions and values in units to match those specified. Include wiring diagrams of electrically powered equipment.

The submittals must be approved before fabrication is authorized.

Submit sufficient quantities of submittals to allow the following distribution:

 Operating and Maintenance Manuals 2 copies

 User agency 1 copy

 A/E 1 copy

 DFD Field Office 1 copy

**PROJECT/SITE CONDITIONS**

***List special or unusual project conditions affecting the Contractor's work.***

Install Work in locations shown on drawings, unless prevented by project conditions.

Prepare drawings showing proposed rearrangement of work to meet project conditions, including changes to work specified in other sections. Obtain permission of DFD before proceeding.

Tools, materials and equipment shall be confined to areas designated by the DFD and user agency.

**WORK SEQUENCE AND SCHEDULING**

Install work in phases to accommodate user agency's occupancy requirements. During the construction period coordinate electrical schedule and operations with DFD's Construction Representative.

**WORK BY OTHER TRADES**

Every attempt has been made to indicate in this trade's specifications and drawings all work required of this Contractor. However, there may be additional specific paragraphs in other trade specifications and addenda, and additional notes on drawings for other trades which pertain to this trade's work, and thus those additional requirements are hereby made a part of these specifications and drawings.

Electrical details on drawings for equipment to be provided by others are based on preliminary design data only. This Contractor shall lay out the electrical work and shall be responsible for its correctness to match equipment actually provided by others.

**OFFSITE STORAGE**

Prior approval by DFD and the A/E will be needed. The contractor shall submit Storage Agreement Form DOA-4528 to DFD for consideration of off-site materials storage. In general, building wire, conduit, fittings and similar rough-in material will not be accepted for off-site storage. No material will be accepted for off-site storage unless shop drawings for the material have been approved.

**SALVAGE MATERIALS**

No materials removed from this project shall be reused unless specifically noted otherwise. All materials removed shall become the property of and shall be disposed of by the Contractor.

 ***Remove the square brackets on the following paragraph and list items below, which the DFD or user agency wishes to retain.***

[The following material shall be removed from service and turned over to the DFD or user agency, at a site selected by the DFD, in the same condition as when it was removed.]

**CERTIFICATES AND INSPECTIONS**

 ***On projects involving the use of Federal funds, insert "and Federal" after "State" in the first line below.***

Obtain and pay for all required installation inspections, except those provided by the DFD, in accordance with the Wisconsin Administrative Code. Deliver originals of these certificates to the DFD's Project Representative.

The Electrical Contractor is responsible for coordination of DFD electrical inspections. Prior to the start of significant on-site electrical work, the contractor shall schedule a pre-installation meeting with the DFD Electrical Inspector to discuss the inspection requirements and review the contract requirements (also see Article 15 of the General Conditions). The Electrical Contractor shall be present when the DFD Electrical Inspector conducts the electrical inspections.

# OPERATION AND MAINTENANCE DATA

All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

In addition to the general content specified under GENERAL REQUIREMENTS supply the following additional documentation:

* 1. Manufacturer’s wiring diagrams for electrically powered equipment.
	2. All required passwords required to gain local access to equipment and controllers.
	3. *[A/E and commissioning provider to define detailed operation and maintenance data requirements for this section per agency direction.]*

**RECORD DRAWINGS**

The Contractor shall maintain at least one copy each of the specifications and drawings on the job site at all times.

The DFD will provide the Contractor with a suitable set of contract drawings on which daily records of changes and deviations from contract shall be recorded. Dimensions and elevations on the record drawings shall locate all buried or concealed piping, conduit, or similar items.

The daily record of changes shall be the responsibility of Contractor's field superintendent. No arbitrary mark-ups will be permitted.

At completion of the project, the Contractor shall submit the marked-up record drawings to the Architect/Engineer prior to final payment.

**PART 2 - PRODUCTS**

**ACCESS PANELS AND DOORS**

***Verify that the following products are specified in the section indicated. Coordinate the location of all access panels and doors with the Architect. Where special products are required to provide access, the products should be specified in the General Contractor portion of the specifications and installed by GPC. Where the exact number and size of panels/doors cannot be established, consider obtaining unit prices; refer to Instructions to Bidders.***

Lay-in Ceilings:

Removable lay-in ceiling tiles in 2 x 2 foot or 2 x 4 foot configuration provided under other divisions are sufficient; no additional access provisions are required unless specifically indicated.

Concealed Spline Ceilings:

Removable sections of ceiling tile held in position with metal slats or tabs compatible with the ceiling system used will be provided under other divisions.

Metal Pan Ceilings:

Removable sections of ceiling tile held in position by pressure fit will be provided under other divisions.

Plaster Walls and Ceilings, Concealed Cavities:

16 gauge frame with not less than a 20 gauge hinged door panel, prime coated steel for general applications, stainless steel for use in toilets, showers and similar wet areas, concealed hinges, screwdriver operated cam latch for general application, key lock for use in public areas, UL listed for use in fire rated partitions if required by the application. Use the largest size access opening possible, consistent with the space and the equipment needing service; minimum size 20” x 30”.

***The Electrical Consultant must coordinate this item with the Architect. Not only are aesthetic parameters involved, but also the Architect must indicate in the General specifications that the General Contractor must install a certain number of these openings so that the costs will be included in the bid.***

**IDENTIFICATION**

See Electrical section 26 05 53 – Identification for Electrical Systems.

**SEALING AND FIRE STOPPING**

FIRE AND/OR SMOKE RATED PENETRATIONS:

Provide all fire stopping of fire rated penetrations and sealing of smoke rated penetrations in compliance with section 07 84 00 “Fire Stopping”.

***Whenever possible, avoid penetrations of fire and smoke rated construction. When they cannot be avoided, verify that the design provides sufficient space for the penetration to be effectively fire and smoke stopped.***

***A/E must identify locations of fire and smoke rated construction and their hourly rating on drawings.***

NON-RATED PENETRATIONS:

***Select from the following paragraphs as appropriate to the project; not all are needed on every project.***

Conduit Penetrations Below Grade:

In exterior wall openings below grade, use a modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the uninsulated conduit and the cored opening or water-stop type wall sleeve.

Conduit and Cable Tray Penetrations Above Grade:

At through-wall conduit and cable tray penetrations of non-rated interior and exterior walls, and floors, use urethane caulk in annular space between conduit and sleeve, or the core drilled opening.

**PART 3 - EXECUTION**

**EXCAVATION AND BACKFILL**

 ***Coordinate the proper section reference given below. Coordinate the excavation work required for this division of the work with the site plan and other architectural work.***

Perform all excavation and backfill work to accomplish indicated electrical systems installation unless noted otherwise.

**CONCRETE WORK**

 ***Coordinate the quantity and location of all cast-in-place concrete work with the architectural drawings. It is desired that the Electrical Contractor perform no concrete work.***

The Division 3 Contractor will perform all cast-in-place concrete unless noted otherwise elsewhere. Provide all layout drawings, anchor bolts, metal shapes, and/or templates required to be cast into concrete or used to form concrete for the support of electrical equipment.

**CUTTING AND PATCHING**

Refer to Division 1, General Requirements, Cutting and Patching.

**BUILDING ACCESS**

Arrange for the necessary openings in the building to allow for admittance of all apparatus. When the building access was not previously arranged and must be provided by this contractor, restore any opening to its original condition after the apparatus has been brought into the building.

**EQUIPMENT ACCESS**

Install all piping, conduit, ductwork, and accessories to permit access to equipment for maintenance. Coordinate the exact location of wall and ceiling access panels and doors with the General Contractor, making sure that access is available for all equipment and specialties. Where access is required in plaster or drywall walls or ceilings, furnish the access doors to the General Contractor and reimburse the General Contractor for installation of those access doors.

**COORDINATION**

The Contractor shall cooperate with other trades and DFD in locating work in a proper manner. Should it be necessary to raise or lower or move longitudinally any part of the electrical work to better fit the general installation, such work shall be done at no extra cost to the DFD, provided such decision is reached prior to actual installation. The Contractor shall check location of electrical outlets with respect to other installations before installing.

The Contractor shall verify that all devices are compatible for the surfaces on which they will be used. This includes, but is not limited to light fixtures, panelboards, devices, etc. and recessed or semi-recessed heating units installed in/on architectural surfaces.

Coordinate all work with other contractors prior to installation. Any installed work that is not coordinated and that interferes with other contractor's work shall be removed or relocated at the installing contractor's expense.

Coordinate all equipment requirements with the various contractors and the Owner. Review the complete set of drawings and specifications to determine the extent of wiring, starters, devices, etc., required. Coordinate the available fault current- equipment including control panels and internal components shall be rated to interrupt the available fault current.

**SLEEVES AND OPENINGS**

Conduit penetrations in new poured concrete horizontal construction requiring F and T rating: Form opening using hole form or core drill opening. Alternatively provide cast in place fire stopping devices/sleeves.

Conduit penetrations in new poured concrete horizontal construction requiring F rating but no T rating: Same as conduit penetrations in new poured concrete construction requiring F and T ratings except that schedule 40 steel pipe sleeves may also be used.

Conduit penetrations in new poured concrete horizontal construction that do not require F or T ratings: Provide schedule 40 steel pipe sleeve, form opening using hole form or core drill opening.

Conduit penetrations in existing concrete floors: Core drill openings.

Conduit penetrations through existing floors located in food service areas that do not require a T rating: Core drill sleeve opening large enough to insert schedule 40 sleeve, extend sleeve 2 inches above the floor and grout area around sleeve with hydraulic setting, non-shrink grout.

***Edit the above list for each project. Add other locations where appropriate.***

Where penetrating conduit weight is supported by floor, provide manufactured product or structural bearing collar designed to carry load.

**SEALING AND FIRE STOPPING**

FIRE AND/OR SMOKE RATED PENETRATIONS:

Provide all fire stopping of fire rated penetrations and sealing of smoke rated penetrations in compliance with section 07 84 00 Fire Stopping.

NON-RATED PENETRATIONS:

***Select from the following paragraphs as it applies to the project; not all are needed on every project.***

In exterior wall openings below grade, assemble rubber links of mechanical seal to the proper size for the conduit and tighten in place, in accordance with the manufacturer's instructions. Install so that the bolts used to tighten the seal are accessible from the interior of the building or vault.

At all interior and exterior walls, through-wall conduit penetrations are required to be sealed. Apply sealant to both sides of the penetration in such a manner that the annular space between the sleeve or cored opening and the conduit is completely blocked.

PENETRATIONS SUBJECT TO WATER INTRUSION:

For penetrations (both rated and non-rated) in floors subject to water intrusion or in rooms housing electrical equipment (but not within walls) provide one of the following:

* Conduit penetration where steel pipe sleeve is used extend steel sleeve 2” above the floor.
* Conduit penetration where cast in place fire stopping device/sleeve is used, extend device/sleeve 2” above the floor (provided it meets the device’s UL listing).
* Conduit penetration where there is no steel sleeve or cast in place fire stopping device/sleeve, provide 2”x 2” x 1/8” galvanized steel angles fastened to floor surrounding the penetration or group of penetrations to prevent water from getting to penetration. Provide urethane caulk between angles and floor and fasten angles to floor minimum 8”on center. Seal corners water tight with urethane caulk.

Floors subject to water intrusion or rooms housing electrical equipment include the following locations:

* Food Service/Kitchen Areas
* Walk In Coolers/Freezers
* Laundries
* Restrooms
* Locker/Shower Rooms
* Janitor Rooms w/ Sinks
* Wet Laboratories
* Mechanical/Plumbing Equipment Rooms
* Swimming Pool Rooms/Pool Equipment Rooms
* Chemical/Hazardous Waste Storage
* Maintenance/Industrial Shops
* Vehicle Storage and Parking Ramps
* Greenhouses
* Data/Telecommunications Rooms
* Electrical Equipment Rooms

***Edit the above list for each project. Add other locations where appropriate. Consultant shall coordinate details on drawings with the above sleeve specification.***

Provide waterproof caulk sealant top coating on fire stopping system (or other approved means to protect the fire stopping system from water) in areas subject to wash down such as Food Service and Dish Washing Areas.

**HOUSEKEEPING AND CLEAN UP**

The Contractor shall clean up and remove from the premises, on a daily basis, all debris and rubbish resulting from its work and shall repair all damage to new and existing equipment resulting from its work. When job is complete, this Contractor shall remove all tools, excess material and equipment, etc., from the site.

**AGENCY TRAINING**

All training provided for agency shall comply with the format, general content requirements and submission guidelines specified under Section 01 91 01 or 01 91 02.

Contractor to provide factory authorized representative and/or field personnel knowledgeable with the operations, maintenance and troubleshooting of the system and/or components defined within this section for a minimum period of [XX] hours.

END OF SECTION