SECTION 262816 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Molded-Case Circuit Breakers and Enclosures:

a. UL DIVQ - Enclosed molded-case circuit breaker.

B. Related Requirements:

1. Section 260010 "Supplemental Requirements for Electrical" specifies additional requirements applicable to coordinating, scheduling, and sequencing of the Work specified in this Section.
2. Section 260526 "Grounding and Bonding for Electrical Systems" specifies grounding and bonding electrical equipment including raceways, electrical power cabling, and communications cabling referenced by this Section.
3. Section 260529 "Hangers and Supports for Electrical Systems" specifies hangers, supports, and concrete bases referenced by this Section.
4. Section 260548 "Vibration and Seismic Controls for Electrical Systems" specifies vibration isolation and seismic- [and wind-] control devices referenced by this Section.
5. Section 260553 "Identification for Electrical Systems" specifies electrical equipment labels and warning signs referenced by this Section.
6. Section 260573 "Power System Studies" specifies short-circuit current analysis, coordination study, arc-flash hazard analysis, warning labels, and circuit-breaker trip ranges referenced by this Section.

1.2 DEFINITIONS

A. AFCI: Arc-fault circuit interrupter.

B. GFCI: Ground-fault circuit interrupter.

C. MCCB: Molded-case circuit breaker.

D. N.C.: Normally closed.

E. NICET: National Institute for Certification in Engineering Technologies; a division of the National Society of Professional Engineers (NSPE).

F. N.O.: Normally open.

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G. SPDT: Single pole, double throw.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of specified product.

1. Product Listing: Include copy of unexpired approval letter, on letterhead of qualified electrical testing laboratory, certifying that model number corresponding to specified product complies with specified listing criteria.

2. Include nameplate ratings, dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
3. Enclosure types and details for types other than UL 50E, Type 1.
4. Current and voltage ratings.
5. Short-circuit current ratings (interrupting and withstand, as appropriate).
6. Include evidence of qualified electrical testing laboratory listing for series rating of installed devices.
7. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.

B. Field quality-control reports.

1.4 INFORMATIONAL SUBMITTALS

A. Manufacturer's published instructions.

B. Field Reports:

1. Manufacturer's field reports for field quality-control support.
2. Field reports for infrared scanning.

1.5 CLOSEOUT SUBMITTALS

A. Warranty documentation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.

B. Regulatory Requirements: Products or components listed and labeled in accordance

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with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.

C. Enclosures:

1. Enclosed Switches and Circuit Breakers: UL 489, NEMA BS 31047, UL 50E, and UL 50, to comply with environmental conditions at installed location.
2. Enclosure Finish: Enclosure must be finished with gray baked enamel paint, electrodeposited on cleaned, phosphatized steel (UL 50E Type 1).
3. Conduit Entry: UL 50E Types 4, 4X, and 12 enclosures may not contain knockouts. UL 50E Types 7 and 9 enclosures must be provided with threaded conduit openings in both endwalls.

4. Enclosures designated as UL 50E Type 4, 4X stainless steel, 12, or 12K must have dual cover interlock mechanism to prevent unintentional opening of enclosure cover when circuit breaker is ON and to prevent turning circuit breaker ON when enclosure cover is open.
5. UL 50E Type 7/9 enclosures must be furnished with breather and drain kit to allow their use in outdoor and wet location applications.

2.2 MOLDED-CASE CIRCUIT BREAKERS AND ENCLOSURES

A. UL DIVQ - Enclosed Molded-Case Circuit Breaker:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Eaton, Siemens, & Square D or comparable product by one of the following:

   a. ABB
   b. Eaton
   c. Siemens Industry, Inc.
   d. Square D; Schneider Electric USA

2. Source Limitations: Obtain products from single manufacturer.
3. Listing Criteria: Investigated, labeled, and marked by UL Solutions or, or other qualified electrical testing laboratory recognized by authorities having jurisdiction in accordance with the following guide information and corresponding standards:

   a. Listed Fused Power-Circuit Devices: UL CCN DIVQ, including UL 489.

4. Standard Features:

   a. Product Reference Standard: NEMA AB 3.
   b. Enclosure Rating: Marked for intended use and location in accordance with UL 50E.
   c. Short-Circuit Current Rating: As determined by results of Power System Studies.
   d. System Frequency: 60 Hz.

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e. Fusing: Nonfused.

f. Lugs: Mechanical type, suitable for number, size, trip ratings, and conductor material. Suitable for 90 deg C rated wire, sized in accordance with 75 deg C temperature rating in NFPA 70.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

1. Commencement of work will indicate Installer's acceptance of areas and conditions as satisfactory.

3.2 SELECTION OF ENCLOSURES

A. Indoor, Dry and Clean Locations: UL 50E, Type 1.

3.3 INSTALLATION, GENERAL

A. Comply with manufacturer's published instructions.

B. Reference Standards for Installation: Unless more stringent installation requirements are specified in the Contract Documents or manufacturer's published instructions, comply with the following:

1. Electrical Construction: ICC IBC, ICC IFC, NFPA 1, NFPA 70, and NECA NEIS 1.
2. Electrical Maintenance: NFPA 70B and NECA NEIS 91.
3. Electrical Safety: NFPA 70E.
4. Commissioning of Electrical Systems: NECA NEIS 90.
5. Commissioning of Active and Passive Fire Protection Features: NFPA 3 and NFPA 4.
6. Hot Work: NFPA 51B.
7. Fire-Alarm and Premises Security Work: NFPA 72, NFPA 731, NFPA 1225, and NECA NEIS 305.
8. Grounding and Bonding: NECA NEIS 331 and Article 250 of NFPA 70.
9. Communications Work: BICSI N1.
10. Work in ITE Rooms: NFPA 75.
11. Work in Health Care Facilities: NFPA 99 and Article 517 of NFPA 70.

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12. Life Safety and Means of Egress Work: NFPA 101.
13. Emergency and Standby Power Work: NFPA 110, NFPA 111, and NECA NEIS 416.
14. Work in Confined Spaces: NFPA 350.
15. Work in Basements and Other Developed Subterranean Spaces: NFPA 520.
16. Evaluation of Unlabeled Electrical Equipment: NFPA 791.
17. Consult Architect for resolution of conflicting requirements.

C. Interfaces with Other Work:

1. Identification: Provide labels for enclosed switches, circuit breakers, and associated electrical equipment.

    a. Identify field-installed conductors, interconnecting wiring, and components.
    b. Label each enclosure with engraved metal or laminated-plastic nameplate.
    c. Provide warning signs and arc-flash hazard warning labels for electrical equipment.

2. Grounding and Bonding:

    a. Equipment Grounding Conductors: Provide and route insulated equipment grounding conductors with other feeder or branch circuit conductors. Bond equipment grounding conductor to enclosure using provided hardware in accordance with manufacturer's published instructions.
    b. Equipment Bonding Conductors: Provide equipment bonding straps or jumpers where additional bonding is indicated on the Drawings between enclosed switches or circuit breakers and adjacent metallic equipment, enclosures, piping, or building structure. Route bonding conductors along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access panels or placing conductors where they may be subjected to strain, impact, or damage.

3.4 ADJUSTING

A. Adjust moving parts and operable components to function smoothly, and lubricate in accordance with manufacturer's published instructions.

3.5 PROTECTION

A. After installation, protect enclosed switches and circuit breakers from construction activities. Remove and replace items that are contaminated, defaced, damaged, or otherwise caused to be unfit for use prior to acceptance by Owner.

END OF SECTION 262816

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