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**SECTION 26 05 29**  
**HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work.

**1.2 RELATED REQUIREMENTS**

- A. Section 26 51 00 - Interior Lighting: Additional support and attachment requirements for interior luminaires.
- B. Section 26 56 00 - Exterior Lighting: Additional support and attachment requirements for exterior luminaires.

**1.3 REFERENCE STANDARDS**

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- C. MFMA-4 - Metal Framing Standards Publication 2004.
- D. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- E. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. UL 5B - Strut-Type Channel Raceways and Fittings Current Edition, Including All Revisions.

**1.4 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
  - 2. Coordinate the work with other trades to provide additional framing and materials required for installation.
  - 3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
  - 4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
  - 5. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
  - 1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Section 03 30 00.

**1.5 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for channel (strut) framing systems, non-penetrating rooftop supports, and post-installed concrete and masonry anchors.
- C. Shop Drawings: Include details for fabricated hangers and supports where materials or methods other than those indicated are proposed for substitution.
- D. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

#### **1.6 QUALITY ASSURANCE**

- A. Comply with NFPA 70.
- B. Comply with applicable building code.
- C. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

#### **1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

### **PART 2 PRODUCTS**

#### **2.1 SUPPORT AND ATTACHMENT COMPONENTS**

- A. General Requirements:
  - 1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
  - 2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
  - 3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported with a minimum safety factor of 3. Include consideration for vibration, equipment operation, and shock loads where applicable.
  - 4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
  - 5. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
  - 6. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
    - a. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
    - b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.
- B. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.
  - 1. Manufacturers:
    - a. Cooper Crouse-Hinds, a division of Eaton Corporation: [www.cooperindustries.com/#sle](http://www.cooperindustries.com/#sle).
    - b. Erico International Corporation: [www.erico.com/#sle](http://www.erico.com/#sle).
    - c. O-Z/Gedney, a brand of Emerson Electric Co: [www.emerson.com/#sle](http://www.emerson.com/#sle).

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- d. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
  - C. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.
    - 1. Manufacturers:
      - a. Cooper Crouse-Hinds, a division of Eaton Corporation: [www.cooperindustries.com/#sle](http://www.cooperindustries.com/#sle).
      - b. Erico International Corporation: [www.erico.com/#sle](http://www.erico.com/#sle).
      - c. O-Z/Gedney, a brand of Emerson Electric Co: [www.emerson.com/#sle](http://www.emerson.com/#sle).
      - d. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
  - D. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
    - 1. Channel (Strut) Used as Raceway (only where specifically indicated): Listed and labeled as complying with UL 5B.
    - 2. Channel Material:
      - a. Indoor Dry Locations: Use painted steel, zinc-plated steel, or galvanized steel.
      - b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel.
    - 3. Minimum Channel Thickness: Steel sheet, 12 gauge, 0.1046 inch.
    - 4. Minimum Channel Dimensions: 1-5/8 inch width by 13/16 inch height.
    - 5. Manufacturers:
      - a. Cooper B-Line, a division of Eaton Corporation: [www.cooperindustries.com/#sle](http://www.cooperindustries.com/#sle).
      - b. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
      - c. Unistrut, a brand of Atkore International Inc: [www.unistrut.com/#sle](http://www.unistrut.com/#sle).
      - d. Source Limitations: Furnish channels (struts) and associated fittings, accessories, and hardware produced by a single manufacturer.
  - E. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.
    - 1. Minimum Size, Unless Otherwise Indicated or Required:
      - a. Equipment Supports: 1/2 inch diameter.
      - b. Busway Supports: 1/2 inch diameter.
      - c. Single Conduit up to 1 inch (27 mm) trade size: 1/4 inch diameter.
      - d. Single Conduit larger than 1 inch (27 mm) trade size: 3/8 inch diameter.
      - e. Trapeze Support for Multiple Conduits: 3/8 inch diameter.
      - f. Outlet Boxes: 1/4 inch diameter.
      - g. Luminaires: 1/4 inch diameter.
  - F. Anchors and Fasteners:
    - 1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
    - 2. Concrete: Use preset concrete inserts, expansion anchors, or screw anchors.
    - 3. Solid or Grout-Filled Masonry: Use expansion anchors or screw anchors.
    - 4. Hollow Masonry: Use toggle bolts.
    - 5. Hollow Stud Walls: Use toggle bolts.
    - 6. Steel: Use beam clamps, machine bolts, or welded threaded studs.
    - 7. Sheet Metal: Use sheet metal screws.
    - 8. Plastic and lead anchors are not permitted.
    - 9. Powder-actuated fasteners are not permitted.
    - 10. Hammer-driven anchors and fasteners are not permitted.
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11. Preset Concrete Inserts: Continuous metal channel (strut) and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.
12. Post-Installed Concrete and Masonry Anchors: Evaluated and recognized by ICC Evaluation Service, LLC (ICC-ES) for compliance with applicable building code.
13. Manufacturers - Mechanical Anchors:
  - a. Hilti, Inc: [www.us.hilti.com](http://www.us.hilti.com).
  - b. ITW Red Head, a division of Illinois Tool Works, Inc: [www.itwredhead.com](http://www.itwredhead.com).
  - c. Powers Fasteners, Inc: [www.powers.com](http://www.powers.com).
  - d. Simpson Strong-Tie Company Inc: [www.strongtie.com](http://www.strongtie.com).

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive support and attachment components.
- C. Verify that conditions are satisfactory for installation prior to starting work.

#### **3.2 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Install anchors and fasteners in accordance with ICC Evaluation Services, LLC (ICC-ES) evaluation report conditions of use where applicable.
- D. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
- E. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.
- F. Unless specifically indicated or approved by Architect, do not provide support from roof deck.
- G. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
- H. Equipment Support and Attachment:
  1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
  2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
  3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
  4. Unless otherwise indicated, mount floor-mounted equipment on properly sized 3 inch high concrete pad constructed in accordance with Section 03 30 00.
  5. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
- I. Conduit Support and Attachment: Also comply with Section 26 05 33.13.
- J. Box Support and Attachment: Also comply with Section 26 05 33.16.
- K. Secure fasteners according to manufacturer's recommended torque settings.
- L. Remove temporary supports.

- M. Identify independent electrical component support wires above accessible ceilings (only where specifically indicated or permitted) with color distinguishable from ceiling support wires in accordance with NFPA 70.

### **3.3 FIELD QUALITY CONTROL**

- A. Inspect support and attachment components for damage and defects.
- B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- C. Correct deficiencies and replace damaged or defective support and attachment components.

**END OF SECTION 26 05 29**