**SECTION 26 05 29**

# HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

**BASED ON DFD MASTER ELECTRICAL SPEC DATED 03/01/23**

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**

**SCOPE**

The work under this section includes conduit and equipment supports, straps, clamps, steel channel, etc., and fastening hardware for supporting electrical work. Included are the following topics:

PART 1 - GENERAL

 Scope

 Related Work

 Submittals

 Quality Assurance

PART 2 - PRODUCTS

 Support Channel

 Conduit Supports

 Nylon Anchors

 Threaded Rod

 Hardware

PART 3 - EXECUTION

 Installation

RELATED WORK

Applicable provisions of Division 1 govern work under this Section.

Section 01 91 01 or 01 91 02 – Commissioning Process

Section 26 05 53 – Identification for Electrical Systems

**SUBMITTALS**

Product Data: Provide data for support channel.

**QUALITY ASSURANCE**

Support systems shall be adequate for weight of equipment and conduit, including wiring, which they carry.

**PART 2 - PRODUCTS**

**SUPPORT CHANNEL**

**Epoxy Painted**

Strut shall be made from steel meeting the minimum mechanical properties of ASTM A1011 SS Grade 33, then painted with water born epoxy applied by a cathodic electro-deposition process.

All fittings and hardware shall be zinc plated in accordance with ASTM B633 (SC3 for fittings, SC1 for threaded hardware).

**Hot-dip Galvanized Steel**

Strut shall be made from steel meeting the minimum mechanical properties of ASTM A1011 SS, Grade 33 and shall be hot-dip galvanized after fabrication in accordance with ASTM A123.

Fittings shall be manufactured from steel meeting the minimum requirements of ASTM A907 SS, Grade 33, and hot-dip galvanized after fabrication in accordance with ASTM A123.

All hardware shall be stainless steel Type 304 or chromium zinc ASTM F1136 Gr. 3.

All hot-dip galvanized after fabrication products must be returned to point of manufacture after coating for inspection and removal of all sharp burrs.

**Stainless Steel**

All strut, fittings and hardware shall be made of AISI Type 304 or Type 316 stainless steel as indicated.

**CONDUIT SUPPORTS**

Conduit clamps, straps, supports, etc., shall be steel or malleable iron.

One-hole straps shall be heavy duty type. All straps shall have steel or malleable backing plates when rigid steel conduit is installed on the interior or exterior surface of any exterior building wall.

Bar joist conduit/box hangers: Spring Steel Clips with Snap-Close Clamps (Conduit Supports): Conduit clamps shall pivot a full 360 degrees and shall snap close around the conduit. Push-in type conduit clamps are not allowed. Spring clips shall require a hammer to install onto supporting surface.

Stud wall applications: Spring Steel Clips with Push-in or Snap-Close Conduit Clamps (Conduit Supports): Conduit clamps shall pivot a full 360 degrees. Spring clips shall require a fastener to install onto stud.

Box/conduit hanger with rod/wire clip (a.k.a. antlers): One assembly provides support for electrical box and conduit from drop wire or rod. Conduit clamps shall snap close around the conduit.

Spring Steel Clip products shall be provided with corrosion resistance and be warranted against failure from corrosion for a period of ten (10) years from date of manufacture.

**NYLON ANCHORS**

Nylon anchors may only be used in limited applications with the pre-approval of the State of Wisconsin DFD Electrical Inspector. See Part 3 – Execution for examples of applications of where nylon anchors may be allowed.

Nylon wall plugs shall be designed for 2-way expansion, providing rapid fixing with high pull-out values. Nylon wall plugs shall be molded with protruding side fins which restrict rotation and prevent fall out from overhead holes. Examples of these include Mungo types MN or MU, or Fischer type S nylon plugs.

Nylon one-piece self-drilling anchors designed for use in hollow gypsum wallboard for light duty loads. Anchors shall be engineered nylon or Zamac alloy. Examples of these are the Zip-It ® or Zip-It Jr. ® self-drilling anchors.

Manufacturer's names and catalog numbers are used for quality and performance only. Anchors manufactured by others shall be equally acceptable provided they meet or exceed in performance and quality as specified.

**THREADED ROD**

Minimum sized threaded rod for supports shall be 3/8” for trapezes and single conduits 1-1/4” and larger, and ¼” for single conduits 1” and smaller.

**HARDWARE**

Corrosion resistant, or as noted for each product above.

**PART 3 - EXECUTION**

**INSTALLATION**

Fasten hanger rods, conduit clamps, and outlet-, junction-, and pull-boxes to building structure using pre-cast insert system, preset inserts, beam clamps, or expansion anchors.

Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion anchors on concrete surfaces; sheet metal screws in sheet metal studs and wood screws in wood construction. If nail-in anchors are used, they must be removable type anchors.

Powder-actuated fasteners are not permitted.

Do not fasten supports to piping, ductwork, mechanical equipment, cable tray or conduit.

Do not fasten to suspended ceiling systems.

Do not drill structural steel members unless approved by DFD.

In wet locations, mechanical rooms, and electrical rooms, install free-standing electrical equipment on 3.5-inch (89 mm) concrete pads.

Install surface-mounted cabinets and panelboards with a minimum of four anchors. At all cabinet and panelboard locations on concrete or concrete block walls, and at ALL locations below grade, provide steel channel supports to stand cabinet one inch (25 mm) off wall (7/8” Uni-strut or 3/4” painted fire-retardant plywood is acceptable). In above-grade equipment rooms that have drywall walls, the cabinets and panelboards may be mounted to the drywall if backing is provided in the stud walls behind the equipment.

Bridge studs top and bottom with channels to support flush-mounted cabinets and panelboards in stud walls.

Furnish and install all supports as required to fasten all electrical components required for the project, including free standing supports required for those items remotely mounted from the building structure, catwalks, walkways etc.

Fabricate supports from galvanized structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.

**Support Channel**

Use one of the following types of support channel as appropriate for the installed environment:

* Indoor: Epoxy Painted Steel, Hot-dipped Galvanized Steel, or as noted on the drawings.
* Exterior and wet locations: Hot-dipped Galvanized Steel or Stainless Steel, as appropriate for the environment or as noted on the drawings. Type 316 stainless steel shall be used for Food Service type environments. Epoxy painted support channel shall not be used for exterior installations.
* Manholes, steam pits, steam tunnels, or corrosive environments: Stainless Steel Type 316.
* Field cuts: File and de-bur cut ends of support channel and paint to prevent rusting. For epoxy-painted support channel, paint cut ends to match the original color. For hot-dipped galvanized support channel, spray cut ends with cold galvanized paint.

**Support Wires**

Support wires that are installed in addition to the ceiling grid support wires to provide secure support for raceways, cables assemblies, boxes, cabinets, and fittings shall be secured at both ends (e.g., the ceiling structure at the top and the ceiling grid at the bottom) per NEC 300.11(A).

Compressed-air power-actuated fasteners may ONLY be used for the installation of separate ceiling wires required for support of conduits and aircraft cable hung light fixtures.

Support wires shall be identified per specification section 26 05 53.

**Spring Steel Clip Conduit Supports for 30 amp or less branch circuits**

 Spring steel clips with snap-close clamps may be used to support conduit/ box from bar joist (steel truss) systems.

Stud wall applications: Spring steel clips with push-in or snap-close conduit clamps may be used to support conduit in interior metal stud wall applications. Use screw fasteners to install conduit clamp onto stud.

Conduit/box hanger with rod/wire clip (a.k.a. antlers) and multi conduit/box support systems: Above suspended ceiling only.

**Nylon anchor applications**

Nylon anchors may only be used in limited light duty applications with the pre-approval of the State of Wisconsin DFD Electrical Inspector.

Nylon anchors shall be designed for the construction material in which they are intended to be installed and shall be designed for the weight in which the anchors are intended to support.

Nylon wall plug applications may include attaching 4” square boxes or conduit straps to plaster-covered clay tile, drywall, or hollow concrete block. Screws used with nylon wall plugs shall be #10 minimum and shall be longer than the anchor.

Nylon one-piece self-drilling anchor applications may include attaching 4” square boxes or conduit straps to hollow gypsum wallboard for light duty loads. Use No. 8 screws with one-piece self-drilling anchors designed for 3/8” to 1” thick wallboard. Use No. 6 screws with anchors designed for 3/8” to 5/8” wallboard.

END OF SECTION