

**COLORADO DEPARTMENT OF TRANSPORTATION
SUBMITTAL OF NEW SPECIFICATION
OR SPECIFICATION CHANGE**

Log No. (Assigned by Standards and Specifications Unit)
613-1-fy23

TO: Standards & Specifications Unit
Construction Engineering
Services Branch

FROM: Traffic Safety & Engineering Branch
(Region, Branch or Technical Committee)

SPECIFICATION SECTION NO.
613

ITEM
613.02(d), 613.07, 613.08,
613.08-14

Priority
Routine Fast

Reason for this new or changed specification:

Add specification requirements, construction requirements, and pay items for pull boxes.

New or Revised Specification:

New – 613.02(d) provides new specifications for pull boxes.

Update – 613.07 provides update to conduit construction requirements.

New – 613.08 provides new construction requirements for pull boxes.

Update – Shift 613.08 through 613.14 to 613.09 through 613.15 and update payment for work items.

NOTE: See Procedural Directive 513.1 for a description of appropriate specification development procedures.

Revision of Section 613 Pull Box Specification and Construction Requirements

Revise Section 613 of the Standard Specifications as follows:

Add to Section 613.02 of the Standard Specifications as follows:

613.02 Roadway lighting materials shall conform to Section 715 and shall be compatible with the requirements of the local agency having jurisdiction.

(d) Pull box. Pull box shall be verified by a 3rd Party Nationally Recognized Independent Testing Laboratory as meeting all test provisions of the American National Standard Institute/Society of Cable Telecommunications Engineers (ANSI/SCTE) 77 Specifications for Underground Enclosure Integrity, including magnesium chloride testing. Pull boxes shall be rated at the Tier 22 level and this rating shall be stenciled or cast on the inside and outside of the box and on the underside of the cover. Pull boxes shall be non-conductive and resistant to ultraviolet (UV) radiation, moisture, and chemicals. Pull boxes shall be Underwriters Laboratories (UL) listed. Certification documents shall be submitted with material submittals.

Pull box removable Type A or Type B lids shall be provided with a skid-resistant surface and have the words “CDOT COMM”, “CDOT ELEC”, or “CDOT TRAFFIC” cast into the surface. Painting of the words shall not be accepted. Pull box removable Type A or Type B lids shall be included in the cost of the pull box.

Pull boxes 24 inches by 36 inches and larger shall have removable Type A or Type B split lids with a removable metal center support beam. Lid segment weight shall not exceed 120 pounds.

An Electrical Marker System (EMS) locator disk manufactured into the Type B lid for communication line locating. The locator disk shall be compatible with a CDOT cable locator and utilize the APWA uniform color code standard for visual reference if the disk is observable on the exterior of the Type B lid. The locator disk shall utilize the proper locate frequency for the pull box type. The words “EMS MARKER EMBEDDED IN COVER” shall be cast into the surface. Painting of the words shall not be accepted.

Type B one-piece lids shall have a minimum of two lift slots per lid, while Type B split lids shall have a minimum of one lift slot per lid. Test point locations shall be integrated into the pull box Type B lids to provide for attachment of test leads of various connector types for underground conduit tracing. The minimum number of test point locations shall equal the number of conduit

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banks entering the pull box, up to a maximum of five test points. Pull boxes with Type B split lids shall have the test points on one lid section only. Type B lids shall be furnished with 3/8 inch x 1/16 inch deep recesses at locations adjoining each test point for the application of direction arrow symbols indicating the direction of underground conduit exiting the pull box. Recesses shall be thoroughly cleaned with alcohol prior to applying arrow symbols.

When wire mesh is included, it shall be installed in a manner to completely surround the pull box. The wire mesh shall meet the material standard American National Standard Institute/American Society of Testing and Materials (ANSI/ASTM) A555-79 and made of T-304 stainless steel, 0.025-inch wire diameter minimum and shall have a spacing of 4 mesh per inch.

Pull boxes installed in dirt of landscaped areas shall have a pre-cast polymer concrete apron. Class B concrete shall be in accordance with section 601.

Pull boxes installed on slopes of 5:1 or less shall be installed with the grade of the slope. Pull boxes installed on slopes greater than 5:1 shall include a 2 foot leveled area surrounding the apron.

The pre-cast polymer concrete apron shall be skid-resistant, non-metallic, non-conductive, UV resistant, and shall include two lifting slots for placement in the field. The pre-cast polymer concrete apron shall be similar nominal dimensions of the concrete apron shown on the plans. The gap between the pre-cast polymer concrete apron and outer wall of the pull box shall be a maximum of 1/4 inch.

When a ground rod is provided, it shall be a 5/8 inch x 8 foot long copper-coated steel rod.

Surface mounted pull boxes shall be aluminum type with a hinged front door and have at least a National Electrical Manufacturers Association (NEMA) 3R rating. Surface mounted pull boxes shall be UL listed. Certification documents shall be submitted with material submittals. The hinged door shall be provided with both a weather tight seal and an aluminum hasp. A keyed lock shall be provided. Surface mounted pull boxes shall be of the dimensions shown on the plans.

Type Six pull boxes shall be a water valve stem type pull box made of cast iron or steel. Type Six pull boxes shall have the capability of accepting riser rings. The lid shall have "CDOT TRAFFIC" cast into the surface. A Type Six pull box

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shall have 3/4 inch to 1 inch diameter holes drilled or torched 3 inches from the top to accept a 4 inch to 6 inch long rubber tube (3/4 inch garden hose). The number of holes shall be as per plans or as directed by the engineer.

Revise paragraph 12 of Section 613.07 of the Standard Specifications as follows:

Surface conduit connections at junction or splice boxes shall be tightly secured and waterproofed. All conduit ends shall be sealed with duct seal or 3" of medium-course brass wool after installation of wiring. The duct seal shall be rated for outdoor use and easily removable.

Add new Section 613.08 of the Standard Specifications as follows:

613.08 Pull Box. A minimum of 12 inches of 3/4 inch angular granite-gravel shall be installed as a base for the pull box. The granite-gravel shall be free of dirt and debris and spread evenly to facilitate a level base for the pull box. The Contractor shall ensure that sufficient compacting is met prior to the installation of granite-gravel to alleviate future settling.

Wire mesh shall be installed to completely surround the pull box as shown on the plans. The wire mesh shall be gently cut to allow only the entrance of the conduit through at the bottom of the pull box. All openings cut in the wire mesh that are larger than the diameter of the conduit shall be covered with additional wire mesh in a manner to completely surround the pull box with wire mesh.

Tracer wire shall be attached to the trace test points on the underside of the pull box lid. Each trace wire shall be attached to an individual trace point; no two wires shall be attached to the same point. The Contractor shall coil an additional 6 feet of tracer wire inside the pull box to ensure that the tracer wire will not disconnect from test points when the lid is removed.

Pull boxes shall be installed in areas that are easily accessible by maintenance personnel. The slope around the pull box in all directions shall not be steeper than 6:1.

Pull boxes installed with concrete aprons or pre-cast polymer concrete shall not be installed above the grade of the apron. The concrete apron shall have a 1 percent slope away from the top of the pull box to allow for drainage. Pre-cast concrete aprons shall be installed per the manufacturer's recommendations. Unless otherwise shown on the plans, pull and splice boxes shall be installed so that the covers are level with curb or sidewalk grade. Covers shall be level with the surrounding ground when

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no grade is established.

Surface mounted pull boxes shall be mounted on or embedded into hard surfaces such as bridge decks, concrete barriers, retaining walls, or buildings, as shown on the plans. Surface mounted pull boxes shall be attached using 3/8 inch epoxy anchors or other methods approved by the Engineer. Surface mounted pull boxes shall not be used for ground installations. Pull tape and tracer wire shall be installed in surface mounted pull boxes.

Pull or splice boxes shall be installed at a maximum distance 400 feet or less. Boxes shall be placed at conduit ends, at all wiring splices, at all conduit angle points, and at all other locations shown on the plans. The Contractor may install additional pull or splice boxes to facilitate the work.

Where practical, pull and splice boxes near curbs shall be placed adjacent to the back of the curb. Pull boxes adjacent to light standards shall be placed along the side of foundations as shown on the plans.

Where a conduit stub-out is called for on the plans, a sweeping elbow shall be installed in the direction indicated. The stub out shall be terminated in a box. All conduit stub outs shall be capped.

Shift Sections 613.08 through 613.14 of the Standard Specifications to Sections 613.09 through 613.15, respectively.

Revise Section 613.14 of the Standard Specifications as follows:

The following items will not be measured and paid for separately, but shall be included in the work:

- (1) Soil testing for foundations.
- (2) Junction boxes, pull wire, weatherheads, adaptors, and expansion joints for conduit.

(3) Pull boxes installed for overhead lighting.

~~(3)~~(4) Additional pull or splice boxes installed at the Contractor's option.

(5) Pull boxes requiring concrete work.

~~(4)~~(6) Saw cutting; trenching; excavation; backfill; jacking; drilling pits; underground electrical warning tape; removal of pavement, sidewalks, gutters, and curbs and their replacement in kind to match existing grade; and all other

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work necessary to complete conduit installation.

~~(5)~~(7) Electrical conductor tagging.

~~(6)~~(8) Direct burial cable in conduit.

~~(7)~~(9) Testing of the lighting installation, including temporary power and all required cable connections.