Revision 6
Aug 2, 2017

1. Scope

1.1 Description

Typical Insulated Conductor

This specification covers the technical requirements for 600 volt THHN (Thermoplastic High Heat-Resistant Nylon jacketed) and XLPE (Cross Linked Polyethylene) insulated copper conductors as specified in the Special Provision Sheet.

1.2 Conductor Size, Temper and Type

Copper conductors, as specified in the Special Provision Sheet, shall be furnished as shown below in Table 1:

MID	Size	Strands	Temper	Insulation Type	Approx. Weight (lb/ft)
846727	12 AWG	1	-	THHN	0.023
846719	10 AWG	1	-	THHN	0.037
847288	4 AWG	1	DSA*	XLPE	0.155
847139	1/0 AWG	19	DSA*	XLPE	0.380
847080	4/0 AWG	19	DSA*	XLPE	0.729
847064	350 kcmil	37	DSA*	XLPE	1.190
847030	500 kcmil	37	DSA*	XLPE	1.670
*DSA = Dead Soft Annealed					

Table 1

2. Reference Standards

Unless otherwise stated in this specification, the conductors shall comply with the latest revisions of the following standards:

ASTM B-3 Standard Specification for Soft or Annealed Copper Wire
ASTM B-8 Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM D 1248 Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable
ANSI/ICEA S-70-547 Standard for Weather-Resistant Polyolefin Covered Wire and Cable
NEC National Electrical Code
NEMA WC-26 Binational Wire and Cable Packaging Standard

3. Service Environment & Operating Requirements

3.1 THHN insulated conductors shall be suitable for dry and damp locations as described in NEC Article 310. XLPE insulated conductors shall be suitable for overhead (aerial) installation and service in wet and dry locations.

3.2 Conductors shall be designed and constructed such that they will operate satisfactorily under maximum conductor temperatures as follows:

Normal Service	90°C
Emergency Overload	130°C
Short Circuit	250°C

4. Insulation

4.1 THHN insulated copper conductors shall be covered with a layer of black thermoplastic high heat resistant insulating material in accordance with the requirements of NEC Article 310.

4.2 XLPE insulated copper conductors shall be covered with a layer of black thermoset cross-linked polyethylene insulating material in accordance with the requirements of ANSI/ICEA S-70-547, Part 3.

4.3 The insulation thickness for each conductor shall be in accordance with the requirements shown below in Table 2:

Size	Min Insulation Thickness (Mils)	Nominal Insulation Thickness (Mils)	Nominal Jacket Thickness (Mils)
12 AWG	-	15	4
10 AWG	-	20	4
4 AWG	27	30	-
1/0 AWG	54	60	-
4/0 AWG	54	60	-
350 kcmil	54	60	-
500 kcmil	72	80	

5. Reel Marking

The following information shall be permanently stenciled or tagged on the outside of each reel:

5.1 Net weight, tare weight, gross weight (not applicable to AWG sizes 12, 10)
5.2 District's purchase order number
5.3 Manufacturer's serial or reel number (not applicable to AWG sizes 12, 10)
5.4 Length of conductor in feet
5.5 Conductor description

6. Bar Coding

6.1 Each reel of conductor shall be bar coded. The exception is that for those conductors that are put-up on plastic reels, which are then bulk-packaged, manufacturers may provide a single bar code label on the outside of the bulk-package. Bar codes shall be formatted similar to Figure 1, shown on page 3. The District and the supplier that will be providing the con-

ductors shall reach agreement on the details of a bar code label that satisfies the District's needs after the contract is awarded and before the conductor is shipped.

6.2 Bar codes shall conform to ANSI/AIM BC2-1995 Code 39 bar code standard.

6.3 The bar code label shall be a minimum of 4" wide x 3" high. It shall be made of durable, weather resistant, premium polyethylene stock. The reel marking information required in Section 5., above, may be included on the bar code label.

6.4 Bar code labels shall be placed on the conductor reels as described above in Section 5.

6.5 As a minimum, bar code labels shall include the following information:

Line	Type	Data	Example
1	Bar Code	District's Material ID Number (13 characters including spaces) Note: When programming the barcode the Number "0" must accompany the end of the Material ID Number. For example, 831108 must be bar-coded as P 00008311080	See Figure 3.
2	Text	District's Material ID Number (12 characters including spaces) Quantity (feet per reel)	0000831108 0 5,000 FT
3	Text	District's Material Description (max. 50 characters including spaces)	WIRE OH BARE #4 ACSR 6/1 STR - SWAN
4	Text	PO Number/Release Number/Line Number Ship Date (8 characters)	PO/REL/LN 00047323 0004 09/13/11
5	Bar Code	PO Number Release Number	See Figure 3.
6	Bar Code	QP (2 characters)	See Figure 3.
7	Text	QP (2 characters)	QP

FIGURE 3

7. Packaging

Conductors shall be packaged as shown below in Table 3:

MID	Size	Reel Type	Flange Dia. Max. (in)	Dum Dia. Min. (in)	Overall Width Max. (in)	Approx. Length per Reel (ft)	Approx Weight per Reel (lb)
846727	12 AWG	Plastic	8	2.25	14	500	12
846719	10 AWG	Plastic	8	2.25	14	500	20
847288	4 AWG	Plastic	11.75	8	3.9	100	25
847139	1/0 AWG	Wood	30	12	21.5	1,500	550
847080	4/0 AWG	Wood	24	10	21.0	500	358
847064	350 kcmil	Wood	36	17	28.5	850	982
847030	500 kcmil	Wood	36	17	28.5	5650	950

Table 3

7.1 Conductors shall have a length per reel (+/- 10%) as specified in Table 3, above.

7.2 Wooden reels shall be nonreturnable, shall be fabricated of wood per NEMA WC 26 and shall satisfy the dimensions given in Table 3 unless otherwise specified by the District. Wooden reels shall have Level 2 type protection over the outer layer of conductor in accordance with NEMA WC 26, Section 4.1.

7.3 Plastic reels for conductor size 4 AWG (Cat. ID 847288) shall be dimensioned per Figure 2 as shown.

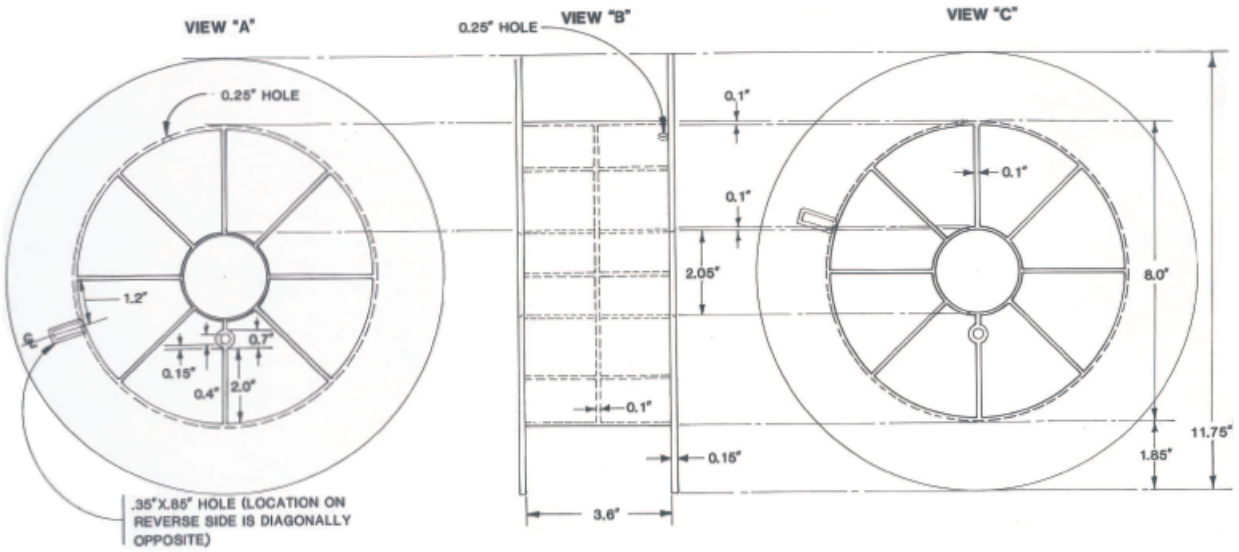

Figure 2

8. Shipping

8.1 Reels of 600 volt insulated copper conductor shall be shipped in enclosed vans or trailers.

8.2 It is preferred that wooden reels be shipped upright on their flanges and positioned for unloading by forklift.

8.3 Wooden reels may be shipped flat on their flanges only if the reels are tightly machine shrink wrapped in such a way as to prevent "birdcaging" in transit.

9. Warranty

9.1 The Supplier warrants that the conductor furnished under this specification is of first class material and workmanship throughout, that it has been tested in accordance with the applicable requirements of this material standard, and that the results of the tests comply with the requirements of this material standard.

9.2 The Supplier agrees to replace (supply new conductor) all conductor that is unsuitable for operation or fails in operation due to defective design, material or workmanship during normal and proper use, within 12 months after being energized or 18 months after delivery to the District.

9.3 All replacements by the Supplier under the provisions of this material standard shall be provided free of charge to the District, including delivery expenses.

10. Inspection

The District reserves the right to inspect all conductor either at the Manufacturer’s plant, upon receipt or at the time of installation. Conductor not meeting specification, or conductor that is damaged, will be rejected and returned at the Supplier’s expense. Acceptance of delivery does not relieve the Supplier from meeting all of the requirements of this material standard.

11. Bidders' Data

Bidders shall submit a list of any and all deviations from this material standard.

12. Evaluation of Bids

The following factors will be considered in analysis and subsequent bid award:

12.1 Base price
12.2 Escalation
12.3 Past experience with Bidder
12.4 Adherence to material standard
12.5 Delivery schedule