

600 V, Aluminum, Underground Triplex and Quad Secondary Cable



1. Scope

This standard covers the requirements for 600 V, aluminum, cross-linked polyethylene (XLPE) insulated, multiplex cable used for the distribution of electric energy.

This standard applies to the following Seattle City Light Stock Numbers:

Stock No.	Size (AWG/kcmil)	Packaging	Code Word(s)	Type
605040	4/0	Reel	Sweetbriar-XLP-YES-USE-2 Regis-XLP-USE-2	Triplex "
605076	350	"	Wesleyan-XLP-YES-USE-2 Concordia-XLP-USE-2	" "
605084	500	"	Rider-XLP-YES-USE-2 Brooklyn-XLP-USE-2	" "
605142	4/0	"	Wake Forest-XLP-YES-USE-2 Lander-XLP-USE-2	Quad "
605176	350	"	Slippery Rock-XLP-YES-USE-2 Susquehanna-XLP-USE-2	" "
605186	500	"	Page-XLP-YES-USE-2 Valparaiso-XLP-USE-2 Wofford-XLP-USE-2	" " "

Standards Coordinator
 Todd Oki

Standards Supervisor
 John Shipek

Unit Director
 Andrew Strong

Aluminum Association code words are cited in this standard for the convenience of the reader. Cable assemblies identified by code word shall be consistent with the requirements of Aluminum Association Tables A, F1, F2, H1, and H2 as appropriate. For brevity, the suffix -YES also represents -YS and -EYS. Code words define:

- Type of construction
- Conductor alloy and temper
- Thickness of phase conductor insulation
- Type of phase conductor insulation
- Neutral construction
- Neutral identification

2. Application

Multiplex cable is for URD secondary applications consisting of single-phase, 3-wire, and three-phase, 4-wire systems nominally rated up to 480 V phase-to-phases, 60 Hz.

Cable shall be suitable for installation in ducts and direct burial in wet or dry locations.

3. Industry Standards

Cable shall meet the applicable requirements of the following industry standards:

ICEA S-105-692-2011 - Standard for 600 Volt Single Layer Thermoset Insulated Utility Underground Distribution Cables

Aluminum Association Code Words for Underground Distribution (UD) Cables, Third Edition (January 1999)

UL Standard 44 - Underwriters Laboratories Inc. Standard for Safety - Thermoset-Insulated Wires and Cables

UL Standard 854 - Underwriters Laboratories Inc. Standard for Safety - Service-Entrance Cables

NEMA WC-26-2008 - Binational Wire and Cable Packaging Standard

4. Conflict

Where conflict exists, the following order of precedence shall apply:

1. This Seattle City Light Material Standard
2. UL standards
3. ICEA standards
4. Aluminum Association
5. Other industry standards

5. Construction

5.1 General

Multiplex cable shall meet the requirements of UL Standard 854 for type USE-2.

Cable shall meet the requirements of ICEA S-105-692, Part 1. Maximum conductor operating temperatures shall be according to Table 5.1.

Table 5.1. Maximum Conductor Operating Temperatures

Insulation Type	Normal Service	Emergency Overload	Short Circuit
XLPE	90° C	130° C	250° C

5.2 Conductors – Phase

Phase conductors shall meet the requirements of ICEA S-105-692, Part 2, with the following clarifications:

Multiplex cable phase conductor alloy shall be either 1350-H19 or 8000 series aluminum.

5.3 Conductors – Neutral

Neutral conductors shall be of the same basic construction as the phase conductors, except they shall be reduced according to Table 5.3.

Table 5.3. Neutral Conductor Reduction Sizes

Phase Conductor Size (AWG/kcmil)	Neutral Conductor Size (Reduced)
4/0	2/0 AWG
350	4/0 AWG
500	350 kcmil

5.4 Insulation

Insulation shall meet the requirements of ICEA S-105-692, Part 3, with the following clarifications:

- Insulation shall be cross-linked polyethylene.
- Minimum and nominal insulation thickness values shall meet the requirements of Table 5.4:

Table 5.4. Conductor Insulation Thickness

Conductor Size (AWG/kcmil)	Minimum Thickness (mils)	Nominal Thickness, (mils)
2/0	72	80
4/0	72	80
350	86	95
500	86	95

Insulation shall be free stripping from the conductor. This may be accomplished by the manufacturing processes or by the addition of a Mylar separator.

5.5 Assembly and Identification

Multiplex cable assembly shall be twisted according to the requirements of ICEA S-105-692, Section 4.1.

Cable shall be marked according to the requirements of ICEA S-105-692, Sections 4.2.1 and 4.2.2, with the following clarification: the outer surface of one or more of the phase conductors shall be durably and legibly marked throughout its length, at a maximum interval of 1 meter, with a print legend.

The print legend shall include, but not be limited to, the following information:

- Manufacturer's identification
- Conductor size
- Conductor metal
- Type of insulation
- Rated voltage
- Year of manufacture
- TYPE USE-2

Each phase conductor of a quadruplex cable assembly shall be identifiable.

Triplex cable assemblies do not require phase conductor identification.

Phase conductor jacket shall be black.

Neutral identification shall be accomplished by one of the following means:

- A solid black jacket with one, two, or three yellow painted or extruded stripes
- A solid black jacket with one, two, or three white painted or extruded stripes
- A solid yellow jacket
- A solid light gray jacket

6. Testing

Cable shall be tested according to the requirements of UL 854.

Test results shall be provided upon request.

7. Packaging

7.1 Detailed Requirements

Cable shall be packaged according to the requirements of NEMA WC-26 and Table 7.

Table 7. Cable Packaging Requirements

Stock No.	Phase Conductor Size (AWG/kcmil)	Packaging	Length per Reel ± 10% (ft)	Outside Flange Diameter, Maximum (in)	Inside Traverse Width, Maximum (in)	Weight per 100 ft, Approx. (lbs)	Weight per Reel, Approx. (lbs)	Type
605040	4/0	Reel	1000	45	28	73	730	Triplex
605076	350	"	1000	66	28	116	1160	"
605084	500	"	1000	66	28	170	1700	"
605142	4/0	"	1000	58	32	102	1020	Quad
605176	350	"	1000	66	28	164	1640	"
605186	500	"	1000	66	28	240	2400	"

7.2 Quantity

Actual quantity per reel may vary from the quantity stated on the Purchase Order by plus or minus 10%.

7.3 Reels

Reels shall be reusable wood type, Class 1 or 2.

Reels may be new or recycled.

Recycled reels (when provided) shall have the surface of both outside flanges painted over with a solid color.

Recycled reels (when provided) shall be equivalent to new in quality and strength.

Reels shall be protected for shipment with coverings consistent with the recommendations of NEMA WC-26, Section 4.

Reels shall be provided with metal bushings if the gross weight of the reel exceeds 1,000 pounds.

7.4 Cable for Shipping

Phase and neutral conductors shall be dry when shipped.

Phase and neutral conductor ends shall be sealed to prevent the entrance of moisture.

The inner end of the cable shall be brought to the outside of the reel flange and securely fastened with appropriately sized steel staples or securely fastened to the inner side of a flange with appropriately sized steel staples.

The inner end shall not be brought out through the reel arbor.

The outer end shall be securely fastened with appropriately sized steel staples to the inner side of the flange.

7.5 Marking

Each reel shall be legibly marked with the following information:

- Manufacturer's identification
- Product description, including code word
- Shipping length of cable on reel
- Gross weight
- Tare weight
- Net weight
- Date of manufacture
- Reel identification according to NEMA WC-26, Section 5
- Seattle City Light purchase order number
- Seattle City Light stock number

8. Shipping

Reels shall be shipped and delivered in the upright position (on the flange edges) on open flatbed trucks suitable for side unloading by forklift.

Reels shall not be strapped or palleted.

Cable shall be shipped to the address specified on the Purchase Order.

9. Issuance

Stock Unit: FT

10. Approved Manufacturers

Prysmian Group
Southwire Company

11. References

Shipek, John; Standards Supervisor, originator and subject matter expert for 6010.10
SCL Material Standard 6010.1 (canceled); "Aluminum, Underground, 1/C, Triplex and Quad Secondary Cable"