28 kV, 1/0, 1/C, TRXLPE Insulated, Jacketed CN Cable

1. Scope

This standard covers the detailed requirements for 28 kV, tree retardant, cross-linked polyethylene (TRXLPE), 1/0, single conductor cable with full concentric neutral (CN) used for the distribution of electric energy.

Industry designation: **1/C +1N**

This standard applies to Seattle City Light (SCL) Stock No. 012098.

2. Application

Cable is intended for use on a nominal 26.4 kV, three-phase, 4-wire, solidly-grounded, wye-connected, 60 Hz power system.

3. General Requirements

This detailed material standard is to be used in conjunction with the latest revision of SCL 6015.00, “Medium Voltage Cable – General.”

4. Industry Standards

Cable shall meet the requirements of the following industry standard:

ICEA S-94-649-2013; “Concentric Neutral Cables Rated 5 Through 46 kV”

See SCL 6015.00 to obtain the appropriate revision date for other referenced industry standards.

5. Construction

5.1 General

Unless indicated otherwise, all values cited below should be consistent with industry standards. They are repeated here for the convenience of the reader. The ▲ symbol indicates special City Light requirements, some of which are detailed in SCL 6015.00.

5. Construction, continued

5.2 Conductor

		Requirements	Reference
Size		1/0 AWG	ICEA S-94-649, Section 2.5, Table 2.4
Diameter	minimum	0.318 in	ICEA S-94-649, Section 2.5
	nominal	0.325 in	ICEA S-94-649, Section 2.5, Table 2.4
	maximum	0.331 in	ICEA S-94-649, Section 2.5
Metal		1350 aluminum	ASTM B233
Stranding type		solid	ASTM B233
Class		none	none
Stranding subtype		none	none
Number of strands		1	none
Temper		H14 (1/2 hard) ▲	ASTM B609
Lay, outer layer		none	none
Lay, successive layers		none	none

5.3 Conductor Shield (Stress Control Layer)

	Requirements	Reference
Thickness, minimum point	12 mil	ICEA S-94-649, Part 3, Table 3-1

5.4 Insulation

		Requirements	Reference
Material		unfilled tree retardant cross-linked polyethylene (TRXLPE)	ICEA S-94-649, Section 4.1
Approved material formulations		specified in general material standard	SCL 6015.00
Thickness	minimum point	265 mil	ICEA S-94-649, Section 4.2, Table 4-7
	nominal	280 mil	ICEA S-94-649, Table 8-1
	maximum point	310 mil	ICEA S-94-649, Section 4.2, Table 4-7
Insulation level		100%	ICEA S-94-649, Section 4.2, Table 4-7
Basic impulse level (BIL)		150 kV crest	ICEA S-94-649, Section 4.3, Table 4-6

5. Construction, continued

5.5 Extruded Insulation Shield

		Requirements	Reference
Material		discharge-free (thermosetting material)	ICEA S-94-649, Section 5.1 to 5.4.1.5
Thickness	minimum point	30 mil	ICEA S-94-649, Section 5.2, Table 5-1
	maximum point	60 mil	ICEA S-94-649, Section 5.2, Table 5-1

5.6 Concentric Neutral Conductor / Metallic Shield

Concentric neutral conductor shall be full rated.

	Requirements	Reference
Metal	copper, uncoated	ICEA S-94-649, Section 6.1
Type	round annealed wire, #14 AWG, helically applied	ICEA S-94-649, Section 6.4
Number of wires, minimum	16	ICEA S-94-649, Section 6.4, Table 6-2
Cross-sectional area, nominal	65,760 cmil	ICEA S-94-649, Section 6.4
Water blocking components for metallic shield	not required	ICEA S-94-649, Section 6.6

5.7 Jacket (Non-Metallic Covering)

		Requirements	Reference
Material		linear low density polyethylene (LLDPE)	ICEA S-94-649, Section 7.1.1
Color		black	ICEA S-94-649, Section 7.1.1
Type		extruded-to-fill	ICEA S-94-649, Section 7.2.1
Thickness	minimum point	45 mil	ICEA S-94-649, Section 7.2.1, Table 7-10
	maximum point	80 mil	ICEA S-94-649, Section 7.2.1, Table 7-10
Maximum diameter over jacket		1.35 in ▲	SCL preference

5. Construction, continued

5.8 Sheath (Continuous Metallic Covering)

Cable shall not be provided with a sheath.

5.9 Assembly and Identification

	Requirements	Reference
Red stripe identification	required ▲	ICEA S-94-649, Section 8.2.1.1

6. Packaging

		Requirements	Reference
Reel type		steel, fluted	WC 26, Section 2.1.2
Reel dimension	flange diameter, maximum	72 in ▲	SCL preference
	outside width, maximum	45 in ▲	SCL preference
	drum diameter, minimum	19 in ▲	SCL preference
	length per reel ± 10%	3400 ft ▲	SCL preference
	gross weight, maximum	3500 lb ▲	SCL preference

7. Issuance

Stock Unit: FT

8. Approved Manufacturing Plants

Manufacturer	Location
Prysmian Group – General Cable	DuQuoin, IL
	Malvern, AR
	Marshall, TX
	Moose Jaw, SK, Canada
	St. Jerome, QC, Canada
Hendrix	Milford, NH
Southwire	Carrollton, GA
	Heflin, AL
CME Wire and Cable	Monterrey, Mexico

9. References

SCL Material Standard 6015.00, “Medium Voltage Cable – General”

10. Sources

Shipek, John; SCL Standards Engineering Supervisor, subject matter expert, and originator of 6020.06