

**28 kV, 1/C, TRXLPE Insulated, Flat Strap Shielded Cable****1. Scope**

This standard covers the detailed requirements for 28 kV, tree retardant, cross-linked polyethylene (TRXLPE), single conductor cable used for the distribution of electric energy.

Industry designation: **1/C**

This standard applies to the following Seattle City Light (SCL) stock numbers:

Stock Number	012099	012100	012101	012102
Size	350 kcmil	500 kcmil	750 kcmil	1000 kcmil

**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.

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**5. Construction, continued****5.2 Conductor**

		Requirements				Reference
<b>Stock Number</b>		<b>012099</b>	<b>012100</b>	<b>012101</b>	<b>012102</b>	SCL
<b>Size</b>		350 kcmil	500 kcmil	750 kcmil	1000 kcmil	various
<b>Diameter</b>	minimum	0.604 in				ICEA S-94-649, Section 2.5
	nominal	0.616 in				ASTM B400
	maximum	0.628 in				ICEA S-94-649, Section 2.5
<b>Metal</b>		1350 aluminum				ASTM B233
<b>Stranding type</b>		concentric-lay				ASTM B400
<b>Class</b>		B				ASTM B400
<b>Stranding subtype</b>		compact				ASTM B400
<b>Number of strands</b>		35-37				ASTM B400, Table 1
<b>Temper</b>		H16 (3/4 hard)				ASTM B609
<b>Lay, outer layer</b>		left hand				ASTM B400, Section 6.4
<b>Lay, successive layers</b>		reversed				ASTM B400, Section 6.4
<b>Sealant for stranded conductors</b>		required ▲				ICEA S-94-649, Section 2.2
<b>Diameter</b>	minimum		0.721 in	0.890 in	1.039 in	ICEA S-94-649, Section 2.5
	nominal		0.736 in	0.908 in	1.060 in	ASTM B496
	maximum		0.751 in	0.926 in	1.081 in	ICEA S-94-649, Section 2.5
<b>Metal</b>			copper	copper	copper	ASTM B49
<b>Stranding type</b>			concentric-lay	concentric-lay	concentric-lay	ASTM B496
<b>Class</b>			none	none	none	none
<b>Stranding subtype</b>			compact	compact	compact	ASTM B496
<b>Number of strands</b>			35-37	58-61	58-61	ASTM B496, Table 1
<b>Temper</b>			soft drawn, annealed prior to stranding			ASTM B3
<b>Lay, outer layer</b>			left hand	left hand	left hand	ASTM B496, Section 5
<b>Lay, successive layers</b>			reversed	reversed	reversed	ASTM B496, Section 5
<b>Sealant for stranded conductors</b>			required ▲			ICEA S-94-649, Section 2.2

**5.3 Conductor Shield (Stress Control Layer)**

		Requirements				Reference
<b>Stock Number</b>		<b>012099</b>	<b>012100</b>	<b>012101</b>	<b>012102</b>	SCL
<b>Size</b>		350 kcmil	500 kcmil	750 kcmil	1000 kcmil	various
<b>Thickness, minimum point</b>		16 mil	16 mil	20 mil	20 mil	ICEA S-94-649, Part 3, Table 3.1

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**5. Construction, continued****5.4 Insulation**

	Requirements				Reference
	012099	012100	012101	012102	
<b>Stock Number</b>	012099	012100	012101	012102	SCL
<b>Size</b>	350 kcmil	500 kcmil	750 kcmil	1000 kcmil	various
<b>Material</b>	unfilled tree retardant cross-linked polyethylene (TRXLPE)				ICEA S-94-649, Section 4.1
<b>Approved material formulations</b>	specified in general material standard				SCL 6015.00
<b>Thickness</b>					
minimum point	265 mil				ICEA S-94-649, Section 4.2, Table 4-7
nominal point	280 mil				ICEA S-94-649, Table 8-1
maximum point	310 mil				ICEA S-94-649, Section 4.2, Table 4-7
<b>Insulation level</b>	100%				ICEA S-94-649, Section 4.2, Table 4-7
<b>Basic Impulse Level (BIL)</b>	150 kV crest				ICEA S-94-649, Section 4.3, Table 4-6

**5.5 Extruded Insulation Shield**

	Requirements				Reference
	012099	012100	012101	012102	
<b>Stock Number</b>	012099	012100	012101	012102	SCL
<b>Size</b>	350 kcmil	500 kcmil	750 kcmil	1000 kcmil	various
<b>Material</b>	discharge-free (thermosetting material)				ICEA S-94-649, Section 5.1-5.4.1.5
<b>Thickness</b>					
minimum point	24 mil				ICEA S-94-649, Section 5.2
maximum point	60 mil				ICEA S-94-649, Section 5.2

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**5. Construction, continued****5.6 Metallic Shield**

Flat strap conductors are for metallic shielding only.

	Requirements				Reference
<b>Stock Number</b>	<b>012099</b>	<b>012100</b>	<b>012101</b>	<b>012102</b>	SCL
<b>Size</b>	350 kcmil	500 kcmil	750 kcmil	1000 kcmil	various
<b>Metal</b>	copper, uncoated or tin coated				ICEA S-94-649, Section 6
<b>Type</b>	flat strap, helically applied ▲				ICEA S-94-649, Section 6
<b>Number of straps</b>	17 +1, -1 ▲	19 +4, -3 ▲	21 +4, -3 ▲	23 +3, -3 ▲	SCL preference
<b>Cross-sectional area, minimum</b>	71,000 cmil ▲	89,000 cmil ▲	98,000 cmil ▲	106,000 cmil ▲	SCL preference
<b>Water blocking components for metallic shield</b>	required ▲				ICEA S-94-649, Section 6.6

**5.7 Jacket (Non-Metallic Covering)**

	Requirements				Reference
<b>Stock Number</b>	<b>012099</b>	<b>012100</b>	<b>012101</b>	<b>012102</b>	SCL
<b>Size</b>	350 kcmil	500 kcmil	750 kcmil	1000 kcmil	various
<b>Material</b>	linear low density polyethylene (LLDPE)				ICEA S-94-649, Section 7.1.1
<b>Color</b>	black				ICEA S-94-649, Section 7.1.1
<b>Type</b>	extruded-to-fill				ICEA S-94-649, Section 7.2.1
<b>Thickness</b>					
minimum point	45 mil	45 mil	70 mil	70 mil	ICEA S-94-649, Section 7.2.1, Table 7-10
maximum point	80 mil	80 mil	120 mil	120 mil	ICEA S-94-649, Section 7.2.1, Table 7-10
<b>Maximum diameter over jacket</b>	1.57 in ▲	1.70 in ▲	2.00 in ▲	2.10 in ▲	SCL preference

**5.8 Sheath (Continuous Metallic Covering)**

Cable shall not be provided with a sheath.

**5.9 Assembly and Identification**

	Requirements				Reference
<b>Stock Number</b>	<b>012099</b>	<b>012100</b>	<b>012101</b>	<b>012102</b>	SCL
<b>Size</b>	350 kcmil	500 kcmil	750 kcmil	1000 kcmil	various
<b>Red stripe identification</b>	required ▲				ICEA S-94-649, Section 8.2.1.1

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**6. Packaging**

	Requirements				Reference
	012099	012100	012101	012102	
<b>Stock Number</b>	012099	012100	012101	012102	SCL
<b>Size</b>	350 kcmil	500 kcmil	750 kcmil	1000 kcmil	various
<b>Reel Type</b>	steel, fluted				WC 26, Section 2.1.2
<b>Flange diameter, maximum</b>	78 in ▲	84 in ▲	84 in ▲	84 in ▲	SCL preference
<b>Outside width, maximum</b>	45 in ▲	50 in ▲	50 in ▲	50 in ▲	SCL preference
<b>Drum diameter, minimum</b>	26 in ▲	26 in ▲	29 in ▲	31 in ▲	SCL preference
<b>Length per reel, +/- 10%</b>	2300 ft ▲	3000 ft ▲	2400 ft ▲	2400 ft ▲	SCL preference
<b>Gross weight, maximum</b>	3500 lb ▲	17,000 lb ▲	17,000 lb ▲	17,000 lb ▲	SCL preference

**7. Issuance**

	Requirements				Reference
	012099	012100	012101	012102	
<b>Stock Number</b>	012099	012100	012101	012102	SCL
<b>Size</b>	350 kcmil	500 kcmil	750 kcmil	1000 kcmil	various
<b>Stock unit</b>	FT				SCL

**8. Approved Manufacturing Plants**

Manufacturer	Location
<b>Prysmian Group – General Cable</b>	DuQuoin, IL
	Malvern, AR
	Marshall, TX
	Moose Jaw, SK, Canada
	St. Jerome, QC, Canada
<b>Southwire</b>	Carrollton, GA
	Heflin, AL

**9. References**

SCL Material Standard 6015.00, "Medium Voltage Cable – General"

**10. Sources**

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