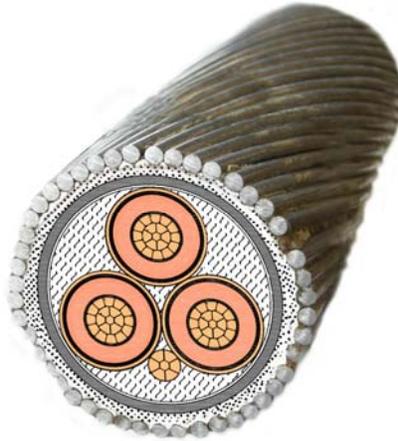


15 KV, 3/C, ARMORED, EPR INSULATED, TAPE SHIELDED CABLE



1. Scope

This standard covers the detailed requirements for 15 kV, armored, ethylene propylene rubber (EPR) insulated, three conductor cable (with one bare ground wire) used for the distribution of electric energy.

Industry designation: **3/C +1G**

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

Stock Number	013306
Size	4/0 AWG

2. Application

Cable is intended for use on a nominal 13.8 kV, three-phase, three-wire, delta, 60 Hz, power system. This product has particular application as a vertical riser cable. Cable will be installed within high-rise buildings and suspended from one end.

Users should be aware that this cable has 220 mil of insulation – a less common value for 15 kV cable at Seattle City Light.

Cable length requirements are site specific. Engineers and Material Control shall plan for minimum order runs of 1,000 feet. Cable shall be shipped only in combinations of the options cited in Table 2.

Table 2

Cable Cut Length, ft	Reel Size and Type	Cable Net Weight, lb	Reel Tare Weight, lb	Total Gross Weight, lb
300	78 x 36 x 48 RT	2,523	890	3,413
600	78 x 41 x 48 RT	5,047	925	5,972
900	84 x 48 x 48 RT	7,570	1,030	8,600

3. General Requirements

This detailed material standard is to be used in conjunction with the latest revision of Seattle City Light Material Standard 6015.00, "Medium Voltage Cable – General."

4. Industry Standards

Cable shall meet the requirements of the following industry standards:

- ICEA S-97-682-2006
- ICEA S-93-639-2000 (Utilized only for its section on metallic and associated coverings.)

Refer to Material Standard 6015.00 to obtain the appropriate revision date for other referenced industry standards.

<i>standards coordinator</i>	<i>standards supervisor</i>	<i>unit director</i>
 John Shipek	 John Shipek	 Darnell Cola

MATERIAL STANDARD

15 kV, 3/C, Armored, EPR Insulated, Tape Shielded Cable

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page: 2 of 5**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. Values or requirements different from industry standards are identified with the symbol ▲. In some situations, the ▲ symbol offers warning that special requirements are located in Material Standard 6015.00.

5.2 Conductor

		Requirements	Reference
Stock Number		013306	SCL
Size		4/0 AWG	various
Diameter	minimum	0.466 in	ICEA S-97-682, Section 2.5
	nominal	0.475 in	ASTM B496
	maximum	0.485 in	ICEA S-97-682, Section 2.5
Metal		uncoated copper	ASTM B49
Stranding type		concentric-lay	ASTM B496
Class		B	ASTM B496
Stranding subtype		compact	ASTM B496
Number of strands		19	ASTM B496
Temper		soft drawn, annealed prior to stranding	ASTM B496
Lay, outer layer		left hand	ASTM B3, Section 5.5.2
Lay, successive layers		reversed	ASTM B3, Section 5.5.2
Sealant for stranded conductors		not required	ICEA S-97-682, Section 2.2

5.3 Conductor Shield (Stress Control Layer)

		Requirements	Reference
Stock Number		013306	SCL
Size		4/0 AWG	various
Thickness, minimum point		12 mil	ICEA S-97-682, Part 3, Table 3-1

5.4 Insulation

		Requirements	Reference
Stock Number		013306	SCL
Size		4/0 AWG	various
Material		ethylene propylene rubber (EPR), Class III	ICEA S-97-682, Section 4.1
Thickness	minimum point	210 mil	ICEA S-97-682, Section 4.2, Table 4-7
	nominal	220 mil	ICEA S-97-682, Table 8-1
	maximum point	250 mil	ICEA S-97-682, Section 4.2, Table 4-7
Insulation level		133%	ICEA S-97-682, Section 4.2, Table 4-7
Basic impulse level (BIL)		110 kV crest	ICEA S-97-682, Section 4.3, Table 4-6

MATERIAL STANDARD

15 kV, 3/C, Armored, EPR Insulated, Tape Shielded Cable

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page: 3 of 5**5. Construction, continued****5.5 Extruded Insulation Shield**

	Requirements	Reference
Stock Number	013306	SCL
Size	4/0 AWG	various
Material	discharge-free (thermosetting material)	ICEA S-97-682, Section 5.1 to 5.5.1.5
Thickness	minimum point	ICEA S-97-682, Section 5.2, Table 5-1
	maximum point	ICEA S-97-682, Section 5.2, Table 5-1

5.6 Metallic Shield

	Requirements	Reference
Stock Number	013306	SCL
Size	4/0 AWG	various
Metal	copper, uncoated	ICEA S-97-682, Section 6.1 to 6.2
Type	helically applied tape with 12.5% nominal overlap	ICEA S-97-682, Section 6.1 to 6.2
Water blocking components for metallic shield	not required	ICEA S-97-682, Section 6.7

5.7 Jacket (Non-Metallic Covering)

Jacket shall be applied over 3/C assembly.

	Requirements	Reference
Stock Number	013306	SCL
Size	4/0 AWG	various
Material	polyvinyl chloride (PVC)	ICEA S-97-682, Section 7.1.6
Color	black	ICEA S-97-682, Section 7.1.6
Type	overlying	ICEA S-97-682, Section 7.2.1
Thickness	minimum point	ICEA S-97-682, Section 7.2.1, Table 7-10
	maximum point	ICEA S-97-682, Section 7.2.1, Table 7-10
Maximum diameter over jacket	2.73 in ▲	SCL preference

5.8 Sheath (Continuous Metallic Covering)

Cable shall be sheathed for the purpose of armor according to the requirements of ICEA S-93-639, Division II, Section 7.4.4 - Vertical Riser Cable.

Sheath shall be applied over jacket.

Wire band servings shall be according to the requirements of ICEA S-93-639, Division II, Section 7.4.1.2 – Wire Band Serving and Table 7-26, with the following clarification:

- Maximum band spacing shall be 25 feet.

Alternative methods of securing the armor wire may be considered.

MATERIAL STANDARD

15 kV, 3/C, Armored, EPR Insulated, Tape Shielded Cable

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5. Construction, continued

5.8 Sheath (Continuous Metallic Covering), continued

	Requirements	Reference
Stock Number	013306	SCL
Size	4/0 AWG	various
Armor composition	galvanized round steel wire	ICEA S-93-639, Section 7.4.3.2, Table 7-25
Armor wire size	#8 BWG	ICEA S-93-639, Section 7.4.3.2, Table 7-25 and Birmingham Wire Gage
thickness/diameter	165 mil	ICEA S-93-639, Section 7.4.3.2, Table 7-25
Maximum diameter over sheath	3.27 in ▲	SCL preference

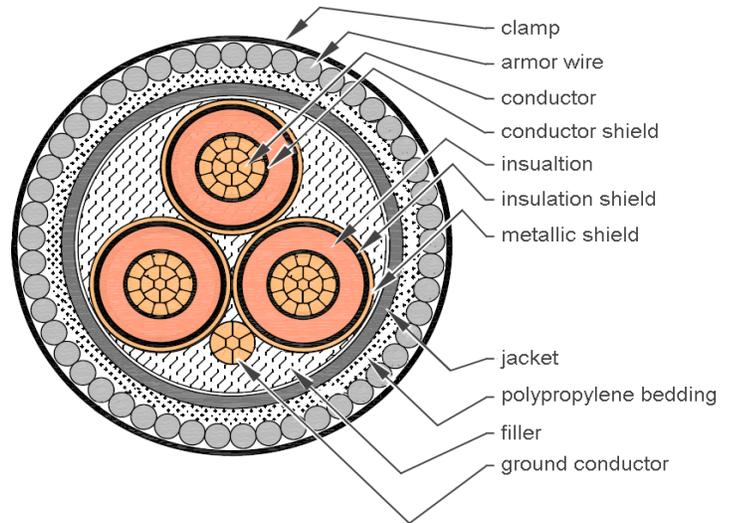
5.9 Assembly and Identification

One bare ground conductor shall be provided under the jacket of the 3/C assembly. The ground conductor shall be located at the interstice of the 3/C assembly.

Bedding shall be applied over the jacket and under the armor sheath.

Alternate bedding methods or materials may be considered.

An asphalt coating over the bedding and/or armor is expressly prohibited.



	Requirements	Reference
Stock Number	013306	SCL
Size	4/0 AWG	various
Ground conductor		
quantity	1 ▲	SCL preference
size	#3 AWG ▲	SCL preference
diameter, nominal	0.24 in	calculation
metal	copper, bare	ASTM B49
stranding type	compact	ASTM B496
stranding subtype	concentric round	ASTM B496
number of strands	7	ASTM B496
temper	soft drawn	ASTM B3
lay, outer layer	left hand	ASTM B3, Section 5.5.1
lay, successive layers	reversed	ASTM B3, Section 5.5.1
Bedding material	jute or polypropylene rove ▲	ICEA S-93-639, Section 7.3.6.2
Thickness, nominal	110 mil	ICEA S-93-639, Section 7.3.6.2, Table 7-18
Red stripe identification	not required	ICEA S-97-682, Section 8.2.1.1

MATERIAL STANDARD

15 kV, 3/C, Armored, EPR Insulated, Tape Shielded Cable

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6. Packaging

	Requirements	Reference
Stock Number	013306	SCL
Size	4/0 AWG	various
Reel type	*	SCL preference
Reel dimension		
flange diameter, maximum	*	SCL preference
outside width, maximum	*	SCL preference
drum diameter, minimum	*	SCL preference
length per reel +10%, - 0%	*	SCL preference
gross weight, maximum	*	SCL preference

* to be determined at the time of order, refer to Section 2, Application

7. Issuance

	Requirements
Stock Number	013306
Size	4/0 AWG
Stock unit	FT

8. Approved Manufacturing Plants

Manufacturer	Location
Okonite	Orangeburg, SC
	Paterson, NJ
	Richmond, KY
	Santa Maria, CA

9. References

- CS-17783**; Okonite Drawing No.; September 7, 2011
- Okoguard Okoseal type MV-105**; Product Data Section 2, Sheet 20
- Shipek, John**; SCL Standards Engineer, subject matter expert and originator for 6025.02 (john.shipek@seattle.gov)