

Insulator, Polymer Spool and Steel Clevis and Angle Bracket



1. Scope

This standard covers the requirements for polymer spool insulators and associated steel clevis and angle brackets.

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

Stock No.	Description
014327	Spool Insulator only
014328	Spool Insulator with Clevis and Pin
690402	Spool Insulator with Angle Bracket, Small
690404	Spool Insulator with Angle Bracket, Large

2. Application

Polymer spool insulators are used with rigid clevis, and angle brackets to deadend or support system neutral conductors and secondary conductors.

3. Industry Standards

Polymer spool insulators and associated steel clevis and angle brackets shall meet the applicable requirements of the following industry standards:

ANSI C29.3-2015 – American National Standard for Wet-Process Porcelain Insulators – Spool Type

IEEE C135.20 – 1998 – Standard for Zinc-Coated Ferrous Insulator Clevises for Overhead Line Construction

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4. Requirements

4.1 Spool Insulators

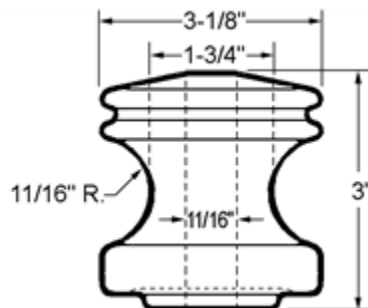
Spool insulators shall meet the requirements of Table 4.1, Figure 4.1, and ANSI/NEMA C29.3 with the following clarification:

Insulator material shall be gray, track-resistant and UV-resistant polymer.

Table 4.1. Insulator Requirements

Attribute	Requirements
Class	53-2 per ANSI C29.3
60 Hz dry flashover, kV rms, minimum	25
60 Hz wet flashover, kV rms, minimum	
Vertical	12
Horizontal	15
Transverse strength rating, lb	3000
Neck designation letter	"A" per ANSI C29.3

Figure 4.1 Insulator Outline



4.2 Clevises, Pins, and Angle Brackets

Clevises, pins, and angle brackets shall meet the requirements of Table 4.2 and IEEE C135.20.

The spool pins for the angle brackets shall be firmly affixed to the brackets by welding. The welding shall only be on the side opposite the spool location. See Figures 4.2c and 4.2d.

Cotter pins shall be made of hard-drawn bronze or stainless steel, and shall be self-locking. The cotter pin must be of an appropriate size to allow insertion with reasonable force, and withdrawal with 4 lb minimum force.

Table 4.2. Clevis, Pin, and Angle Bracket Requirements

Attribute	Requirement
Material	Steel
Coating	Zinc (hot-dip), 3 mils minimum
Clevis ultimate strength, lb	4000
Clevis reference	IEEE C135.20, Figure 1, Item 2
Clevis and pin dimensions	Figures 4.2a, 4.2b
Pin refence	IEEE C135.20, Figure 6, Item 4
Angle Bracket ultimate strength, lb	
Small	3000
Large	3000
Angle Bracket dimensions	
Small	Figure 4.2c.
Large	Figure 4.2d.
Linear dimensional tolerances	+/- 1/8 inch, unless otherwise shown

Figure 4.2a. Clevis and Pin

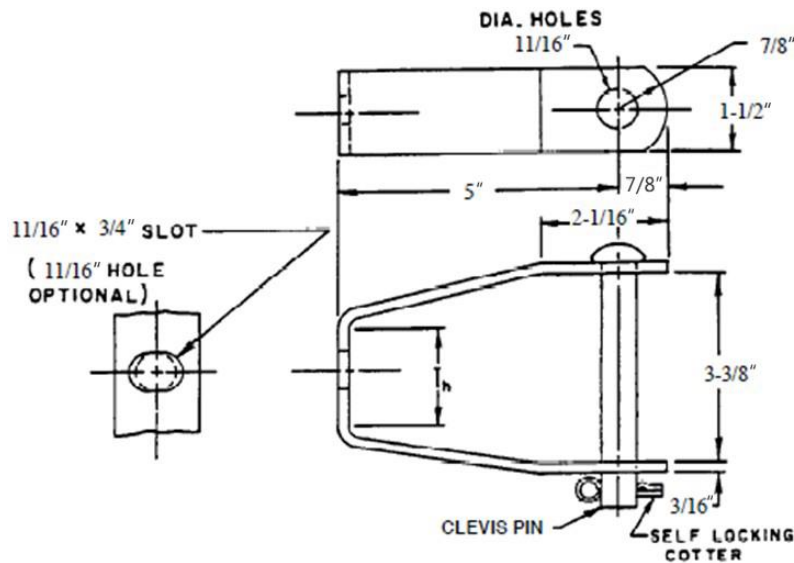


Figure 4.2b. Clevis Pin Detail

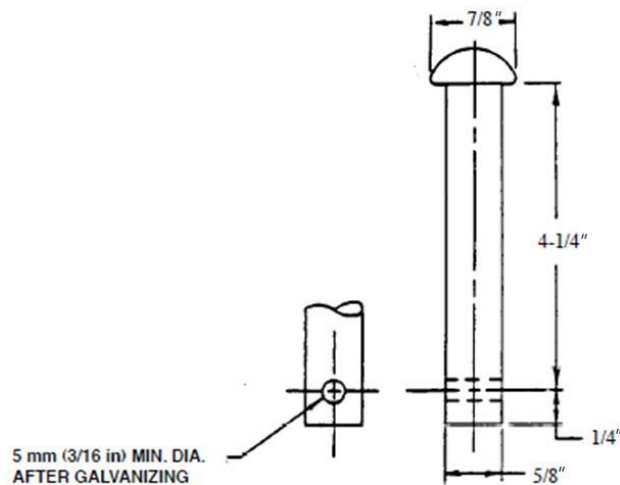


Figure 4.2c. Angle Bracket, Small

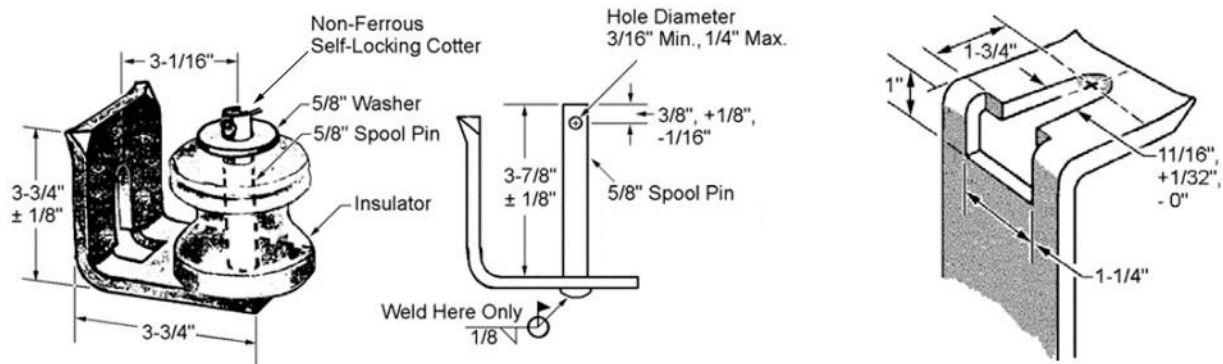
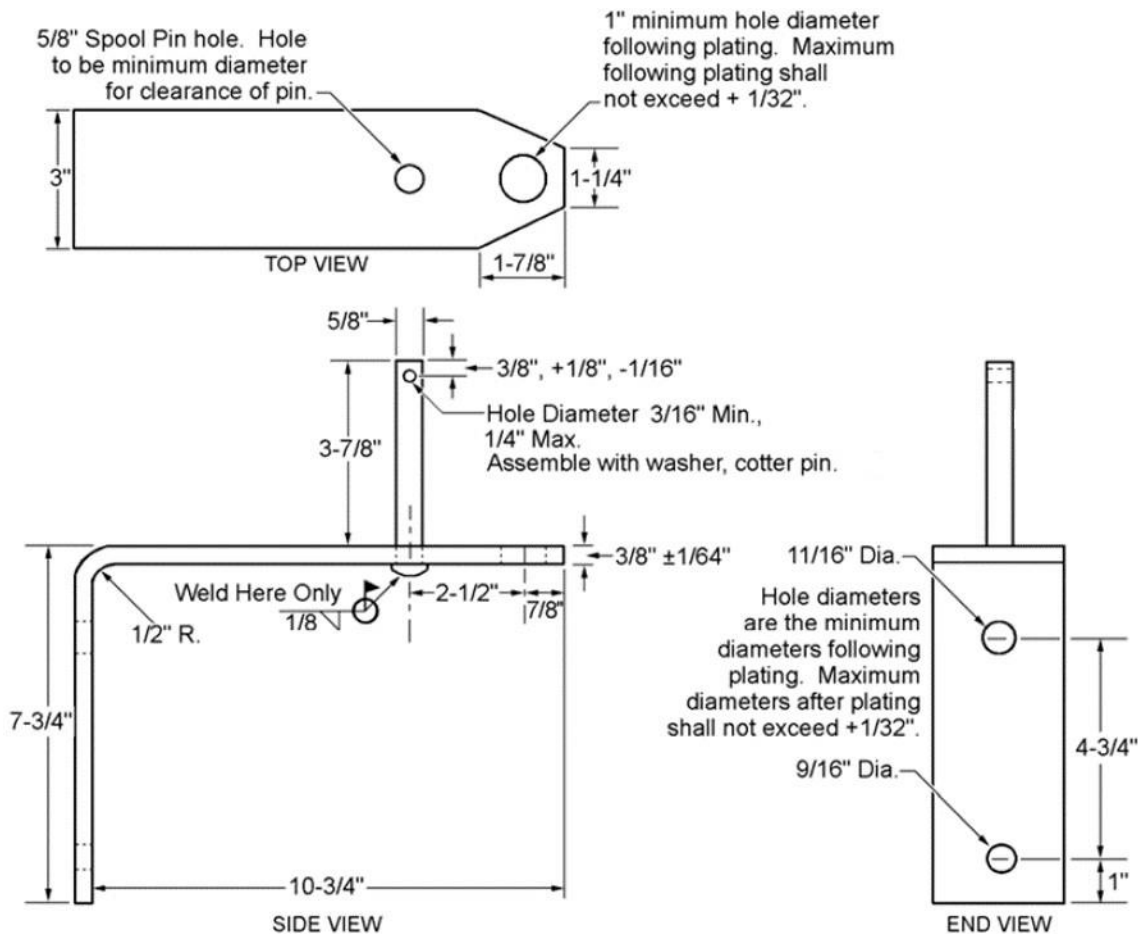


Figure 4.2d. Angle Bracket, Large



5. Marking

Marking shall be legible and durable over the expected life of the product.

Each spool insulator shall be marked with:

- Manufacturer name or symbol
- ANSI C29.3 class number or catalog number

Each clevis and angle bracket shall bear the manufacturer symbol or identification marking per ANSI C135.20, Section 9.

6. Packaging

Spool insulators, clevis, and angle bracket assemblies shall be packaged in a way that prevents damage during shipping, handling, and long-term outside storage.

Clevis and angle bracket assemblies shall be shipped assembled.

Individual packages shall be legibly marked with:

- Manufacturer name
- Manufacturer catalog number
- Seattle City Light stock number

Each shipping container shall be legibly marked with:

- Manufacturer identification
- Seattle City Light purchase order number

7. Issuance

Stock Unit: EA

8. Approved Manufacturers

Stock No.	Description	Approved Manufacturers			
		Hendrix Molded Products	Hubbell Power Systems	Preformed Line Products	Wilcor Grounding Systems
014327	Spool Insulator only	HPI-53-2	C9091032PG	IP-53-2	–
014328	Spool Insulator with Clevis and Pin	–	0340 with C9091032PG	–	–
690402	Spool Insulator with Angle Bracket, Small	–	–	–	WAPRS
690404	Spool Insulator with Angle Bracket, Large	–	–	–	WAPRS-X

9. References

SCL Material Standard 6904.10 (canceled); “Insulator, Porcelain, Spool and Clevises”

SCL Material Standard 6904.20 (canceled); “Bracket with Secondary Spool Insulator, Assembled”

10. Sources

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Shipek, John; SCL Standards Supervisor and subject matter expert for 6904.15 (john.shipek@seattle.gov)