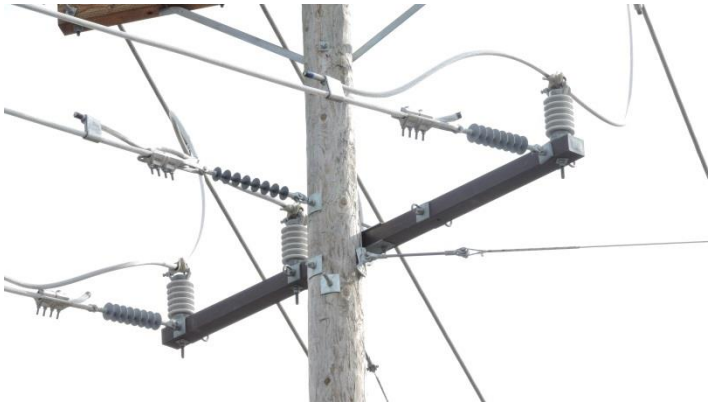
Deadend Assemblies, Fiberglass



1. Scope

This standard covers the requirements for 4-pin position fiberglass deadend crossarm assemblies.

This standard applies to Seattle City Light (SCL) Stock No. 013636.

2. Application

Fiberglass deadend assemblies are used to construct the overhead distribution system.

Deadend assemblies consist of a crossarm, a mounting bracket with a double-guy attachment, and two eye nuts on the front and back of the crossarm.

3. Industry Standards

Fiberglass deadend assembly components shall meet the applicable requirements of the latest revision of the following industry standards.

ASTM A36; Specification for Carbon Structural Steel

ASTM A123; Specification for Zinc (Hot-Dip Galvanized) Coating on Iron and Steel Products

ASTM A153; Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware

ASTM A871; Standard Specification for High-Strength Low-Alloy Structural Steel Plate with Atmospheric Corrosion Resistance

ASTM D635; Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position

ASTM D2344; Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates

ASTM D2584; Standard Test Method for Ignition Loss of Cured Reinforced Resins

ASTM D3917; Standard Specification for Dimensional Tolerance of Thermosetting Glass-Reinforced Plastic Pultruded Shapes

ASTM D4385; Standard Practice for Classifying Visual Defects in Thermosetting Reinforced Plastic Pultruded Products

ASTM E165; Practice for Liquid Penetrant Inspection Method

ASTM E709; Practice for Magnetic Particle Examination

ASTM G154; Standard Practice for Operating Fluorescent Ultraviolet (UV) Light Apparatus for Exposure of Nonmetallic Materials

ANSI O5.3; Solid Sawn-Wood Crossarms and Braces - Specifications and Dimensions

ASME B1.1; Unified Inch Screw Threads

AWS D1.1; Structural Welding Code–Steel

RUS 1724e-151; Mechanical Loading on Distribution Crossarms

RUS 1724e-200; Design Manual for High Voltage Transmission Lines

4. General Requirements

4.1 Crossarm Material

Crossarm material shall be self-extinguishing.

Crossarm material shall conform to the chemical and mechanical properties as specified in accordance with ASTM D2344, D2584, D3917, and G154 test methods.

Crossarm material shall be boron-free to prevent corrosive failures.

Crossarm exterior color shall be brown.

4.2 Protective Coating

Fiberglass crossarms shall be treated with UV-resistant coating to protect against UV degradation.

Crossarms shall be tested for accelerated weathering and ultraviolet aging for 2500 hours without any degradation of strength or modulus of elasticity (MOE) and without deterioration of color in accordance with ASTM G154.

UV coating shall have a minimum protective life expectancy of 40 years.

4.3 Hardware, Structural Steel and Accessories

All steel components shall be compliant with ASTM A36, A572, or A871 specifications. Only the grades of steel cited in the above ASTM specifications will be allowed unless approved by Seattle City Light Standards.

Mounting bracket shall be made of hot-rolled steel or welded structural steel.

All hardware, including mounting bracket, bolts, washers, and nuts shall be hot-dipped galvanized in accordance with ASTM A153 and shall have a finger-free fit.

Mounting bracket dimensions shall be as shown in Figure 5.2a.

5. Detailed Requirements

Fiberglass deadend assemblies shall be designed and fabricated to conform to the requirements of ASTM D3917 and ANSI O5.3.

5.1 Dimensions

Table 5.1. Dimensional Crossarm Tolerances

Length	±1/4 in
Height	±1/8 in
Width	±1/8 in
Hole spacing	1/16 in, minimum
Hole diameter	±1/16 in

5.2 Assembly Dimensions

Figure 5.2a. Mounting Bracket Dimensions

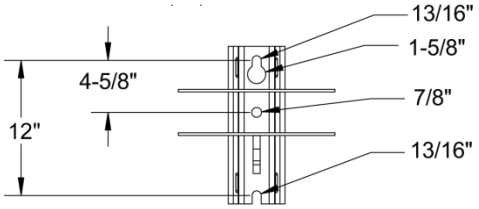


Figure 5.2b. Top View Dimensions

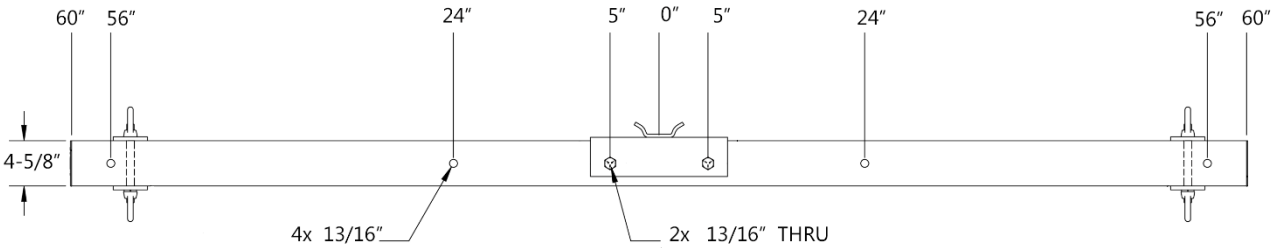


Figure 5.2c. Front View Dimensions

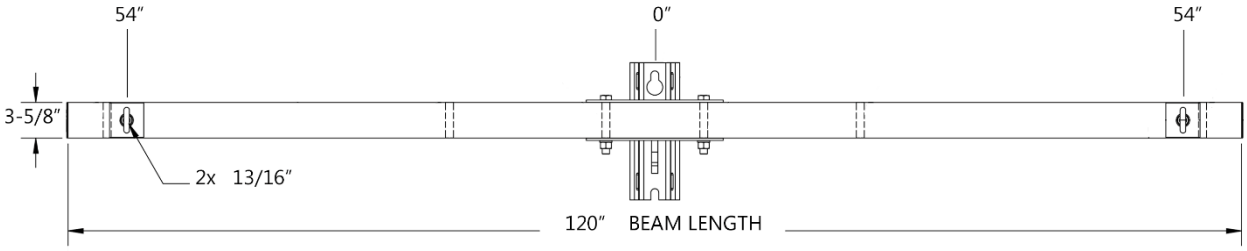
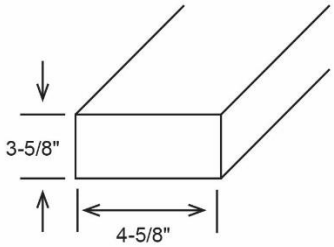


Figure 5.2d. End View Dimensions



5.3 Assembly Component List

Each assembly shall consist of the following.

Component	Quantity
Fiberglass crossarm beam with end caps	1
Deadend mount assembly	1
Bolt, 3/4-10 x 5-1/2 in	2
Lock washer, 3/4 in	4
Hex nut, 3/4-10	2
Square washer, 13/16 in, 3-1/2 in x 3/8 in	4
Eye nut, 3/4-10	4 (2 ea on front and back of crossarm)

Crossarm box structure shall not be compressed during hardware installation.

5.4 Assembly Strength Properties

Fiberglass deadend assemblies shall meet or exceed the strength properties cited in Table 5.4.

Table 5.4. Assembly Strength Properties

Ultimate Capacity	Requirement
Longitudinal (lb/wire)	10,000
Vertical (lb/wire)	2500
Transverse (lb_f)	1150

Note: Strength properties are based on a two-wire configuration, 6 inches from arm end.

Fiberglass crossarms shall meet or exceed ultimate moment capacity and deflection characteristics of equivalent wood arms for of each major axis (wood crossarm based on a Modulus of Rupture (MOR) of 7400 psi and Modulus of Elasticity (MOE) of 1.8x106 psi) in accordance with ANSI O5.3.

Attachment points for pin-type insulators must meet the following transverse pin test requirements in accordance with ANSI O5.3:

- Transverse load shall be applied to a 1-3/8-in thread pin with a 2-1/4-in washer mounted on the fiberglass crossarm.
- Fiberglass member shall withstand transverse load up to 750 lb without crushing.
- Transverse load to be gradually increased to 1650 lb or ultimate, whichever comes first, and results shall be reported.

Crossarms shall not exhibit more than 3.25-in of deflection in any direction when subjected to the maximum loading expected for 954.5 kcmil ACSR “Rail” conductor with a 125-ft ruling span and a 250-ft maximum span under NESC 250B Medium. Vertical, longitudinal and transverse loads are to be applied simultaneously.

6. Marking

Each assembly shall be permanently and legibly marked with the following:

- Name or trade mark of the manufacturer
- Year of manufacture
- Specified mechanical load
- Product serial number or identification number

Marking shall be placed in a location on the crossarm and of a size and font that is visible from the ground. Marking shall be non-metallic. Marking requirements shall also be detailed on the fabrication drawings.

7. Packaging

Assemblies shall be packaged in bundles of 25.

Each assembly bundle shall be marked legibly with the following information:

- Manufacturer identification number
- Gross weight
- Tare weight
- Net weight
- Date of manufacturer
- Seattle City Light purchase order number
- Seattle City Light stock number

8. Issuance

EA

9. Approved Manufacturers

Manufacturer:	**PUPI**
Catalog Number:	DA3000120E20403
where:	
D =	Deadend
A =	Deadend 12-in hole space, double guy attachment
30 =	Beam series = 3000
0 =	Number of beams in assembly = 1
0 =	TorqueGuard bushings included in all holes
120 =	Length (in inches)
E =	Eye nuts front and back side
2 =	2-wire position
040 =	Drill specs, SCL
3 =	Brown

Manufacturer:	**Aluma-Form**
Catalog Number:	FDA30B-2-120-EB-IP-FG-HND
where:	
FDA =	Fiberglass deadend arm
30 =	Extra heavy duty
B =	B = Brown
2 =	2-wire position
120 =	Length (in inches)
EB =	Double eye bolts
IP =	Pin holes with inserts
FG =	Fabricated gain with a double guy attachment
HND =	Drill specs, SCL

10. Sources

Maloney, Jim; SCL Asset Management Strategic Advisor and subject matter expert for 5055.10 (jim.maloney@seattle.gov)

National Electrical Safety Code (NESC), C2-2012 Edition; Institute of Electrical and Electronics Engineers (IEEE) Inc., New York, NY, 2011

SCL Material Standard 5417.05; Deadend Assembly, Fiberglass (canceled / renumbered to 5055.10)

PUPI; www.pupicrossarms.com

Wang, Quan; SCL Standards Engineer and originator of 5055.10 (quan.wang@seattle.gov)