
115 kV Vertical Deadend Pole Top Assemblies

1. Scope

This standard provides the information necessary to construct the pole top assemblies for 115 kV single-circuit vertical deadend poles supporting 795 and 954 kcmil ASCR conductors on the 115 kV transmission system.

Criteria for pole top assemblies covered under this standard include the following:

Grade of construction	B
Design criteria	NESC Medium
Pole class	H1 or stronger
Soil condition	Average
Allowable corner angle	0°–120°

If a deadend is not required, refer to SCL 1621.10 for tangent (0°–5°) pole top assemblies, and to SCL 1621.20 for running angle (5°–60°) pole top assemblies.

Composite, steel, laminated, and other non-wood poles are outside the scope of this standard.

2. Application

This standard provides direction to Seattle City Light (SCL) engineers, crews, and contractors for the installation of single-circuit, vertical deadend pole top assemblies on 115 kV transmission poles with 745 kcmil ACSR and 954 kcmil ACSR conductors.

3. Requirements

115 kV vertical deadend pole top assemblies shall be used for inline or corner angle construction where there is a change in conductor type, conductor tension, and critical crossings.

The minimum allowable phase conductor jumper-to-pole surface shall be 28 inches. Where the phase jumper clearance cannot be maintained, a horizontal line post insulator shall be installed. See figures 3c, 3d, and 3e.

115 kV vertical deadend pole top assemblies shall be constructed as shown in Table 3.



Table 3. 115 kV Vertical Deadend Pole Top Assemblies

Allowable Line Angle	Figure(s)
In-line, without static wire	3a
In-line, with static wire	3b, 3i
15°–60°, without static wire	3c, 3d
15°–60°, with static wire	3d, 3e, 3i
60°–120°, without static wire	3f, 3g
60°–120°, with static wire	3g, 3h, 3i

Aluminum quadrant strain clamps shall be used on wood pole deadend structures for low tension applications (maximum design tension of 5000 pounds or less).

For grounding of static wire, see SCL 0462.10.

Figure 3a. 115 KV Vertical Deadend Pole Top Assembly, In-Line

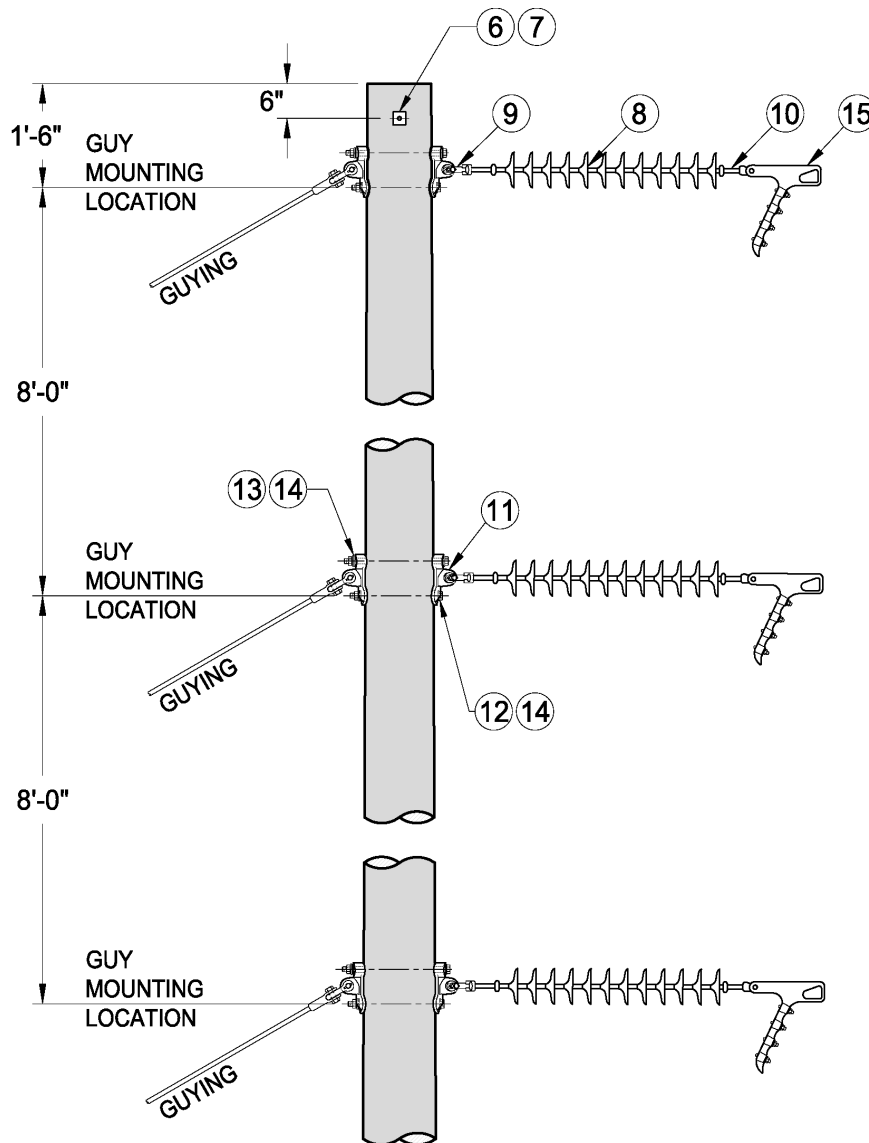


Figure 3b. 115 KV Vertical Deadend Pole Top Assembly, In-Line, with Static Wire

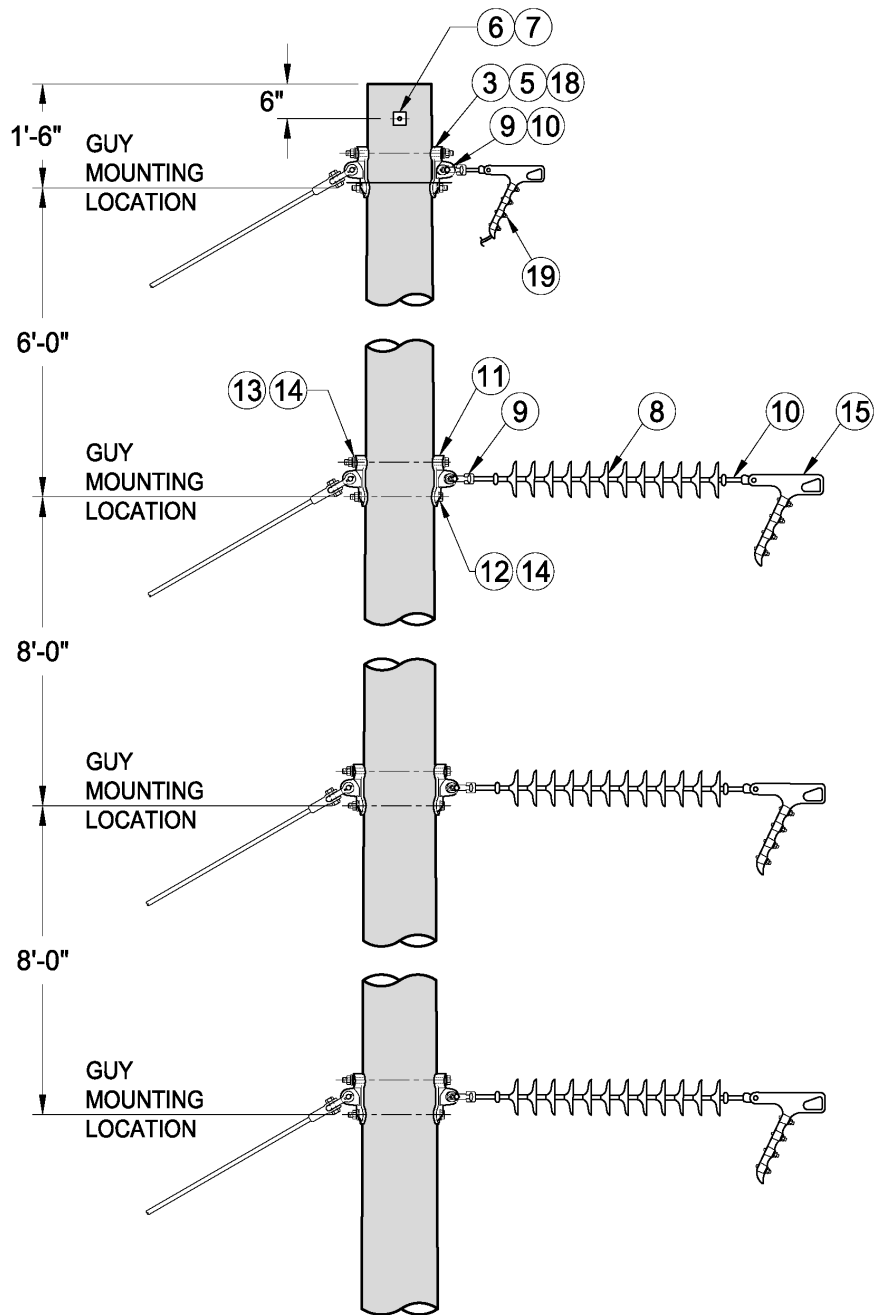


Figure 3c. 115 KV Vertical Double Deadend Pole Top Assembly (15°– 60°)

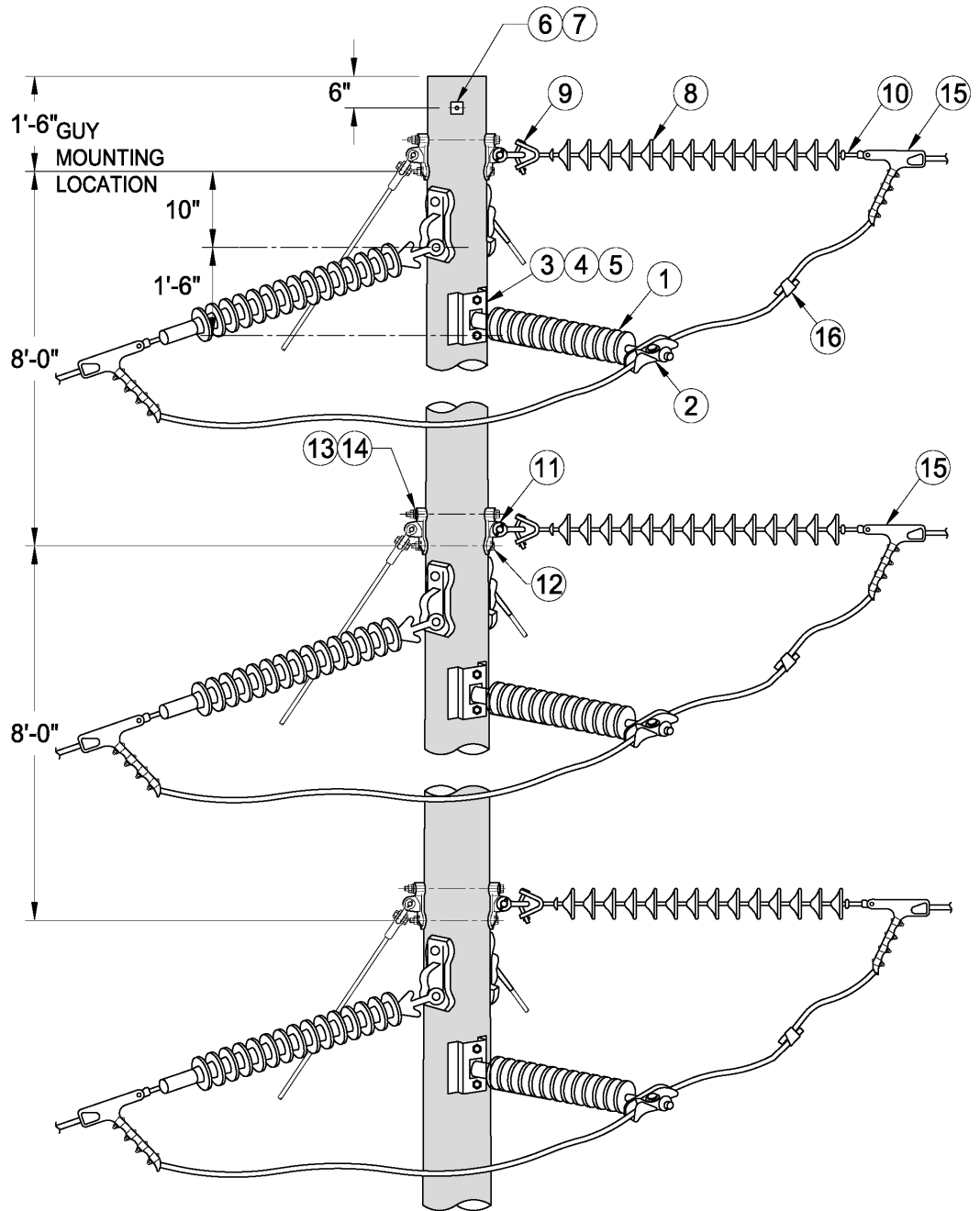


Figure 3d. 115 KV Vertical Double Deadend Pole Top Assembly (15°– 60°), Plan View

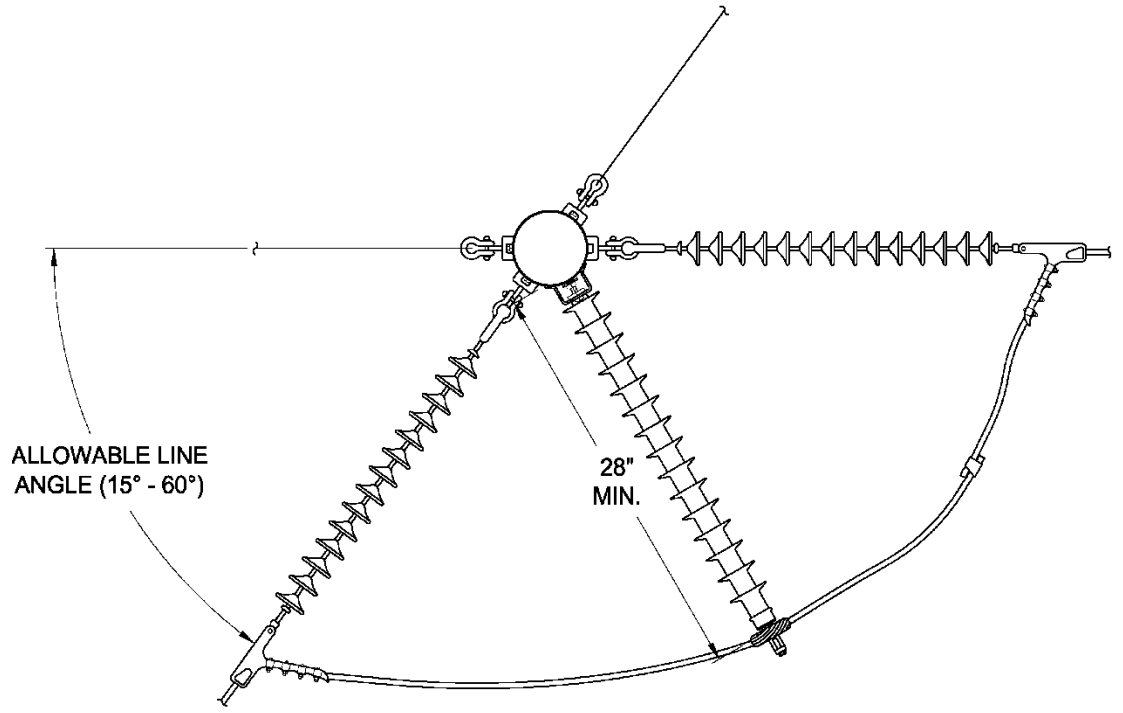


Figure 3e. 115 KV Vertical Double Deadend Pole Top Assembly (15°– 60°) with Static Wire

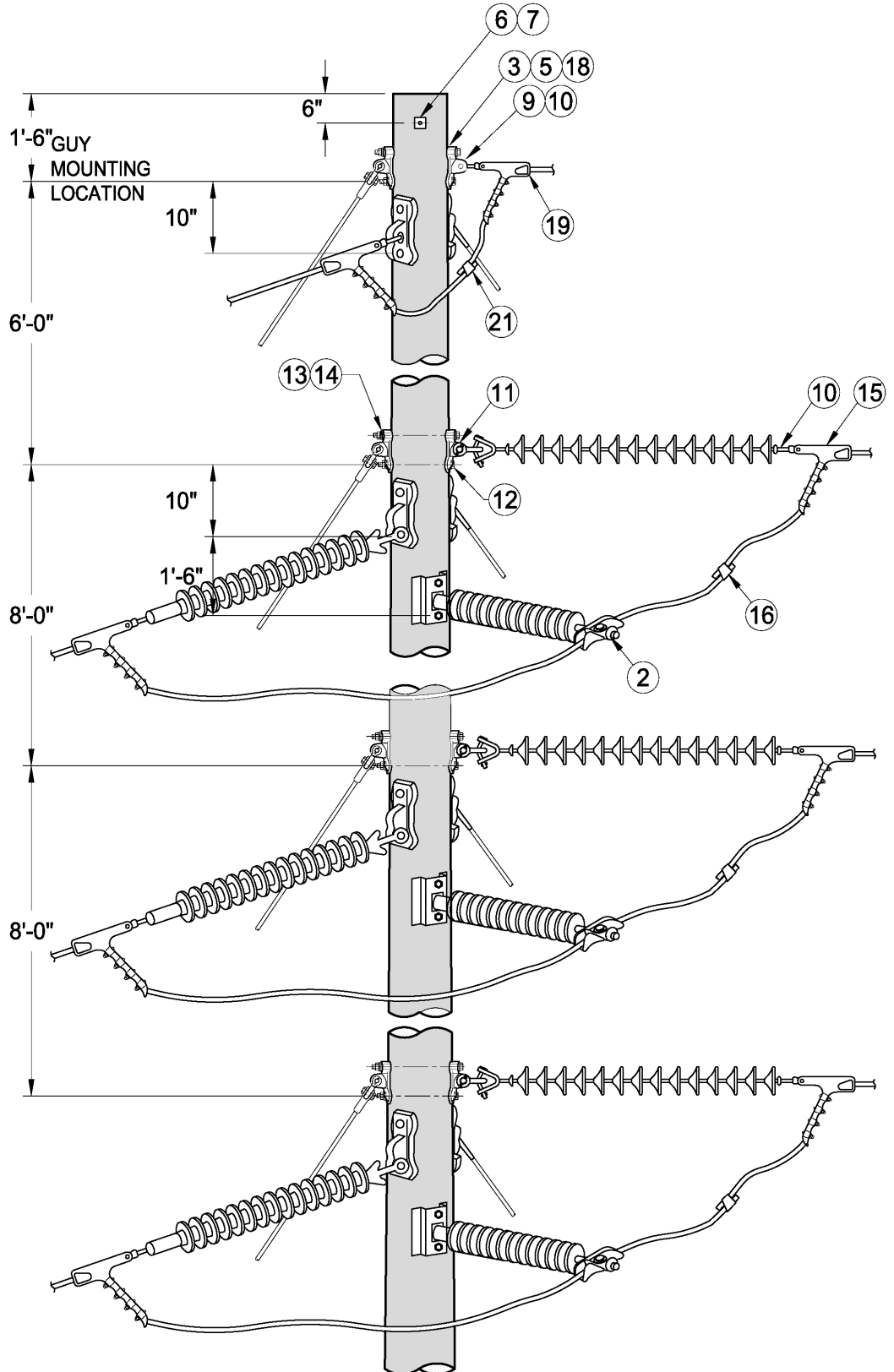


Figure 3f. 115 KV Vertical Double Deadend Pole Top Assembly (60°– 120)

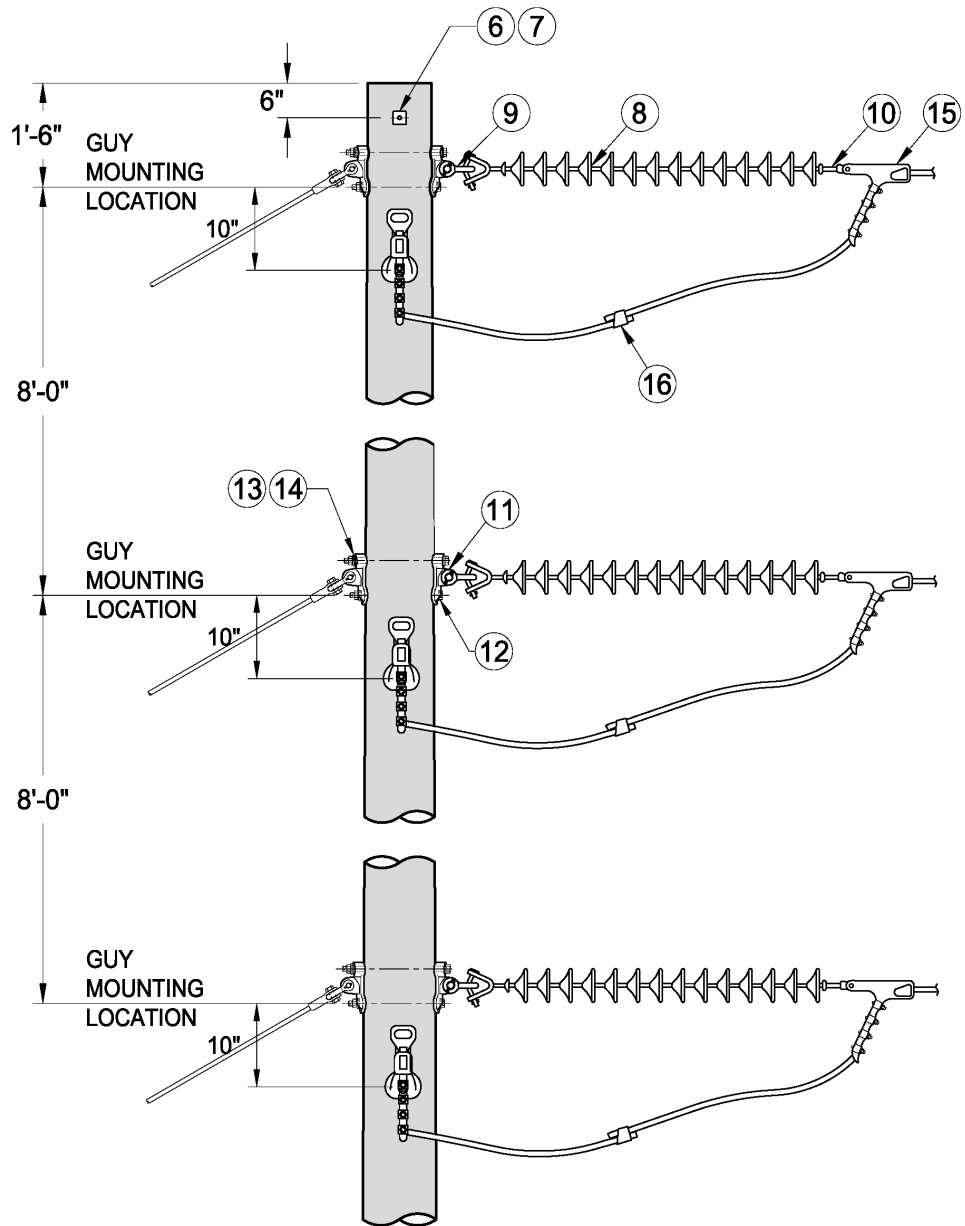


Figure 3g. 115 KV Vertical Double Deadend Pole Top Assembly (60°– 120), Plan View

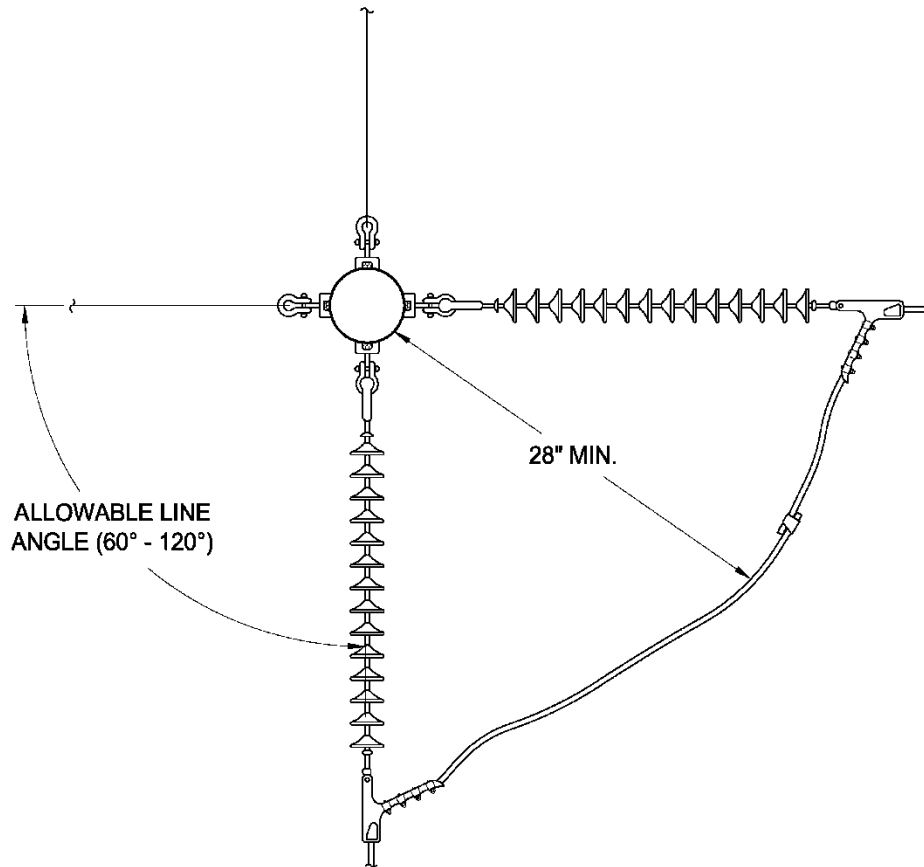


Figure 3h. 115 KV Vertical Double Deadend Pole Top Assembly (60°– 120°) with Static Wire

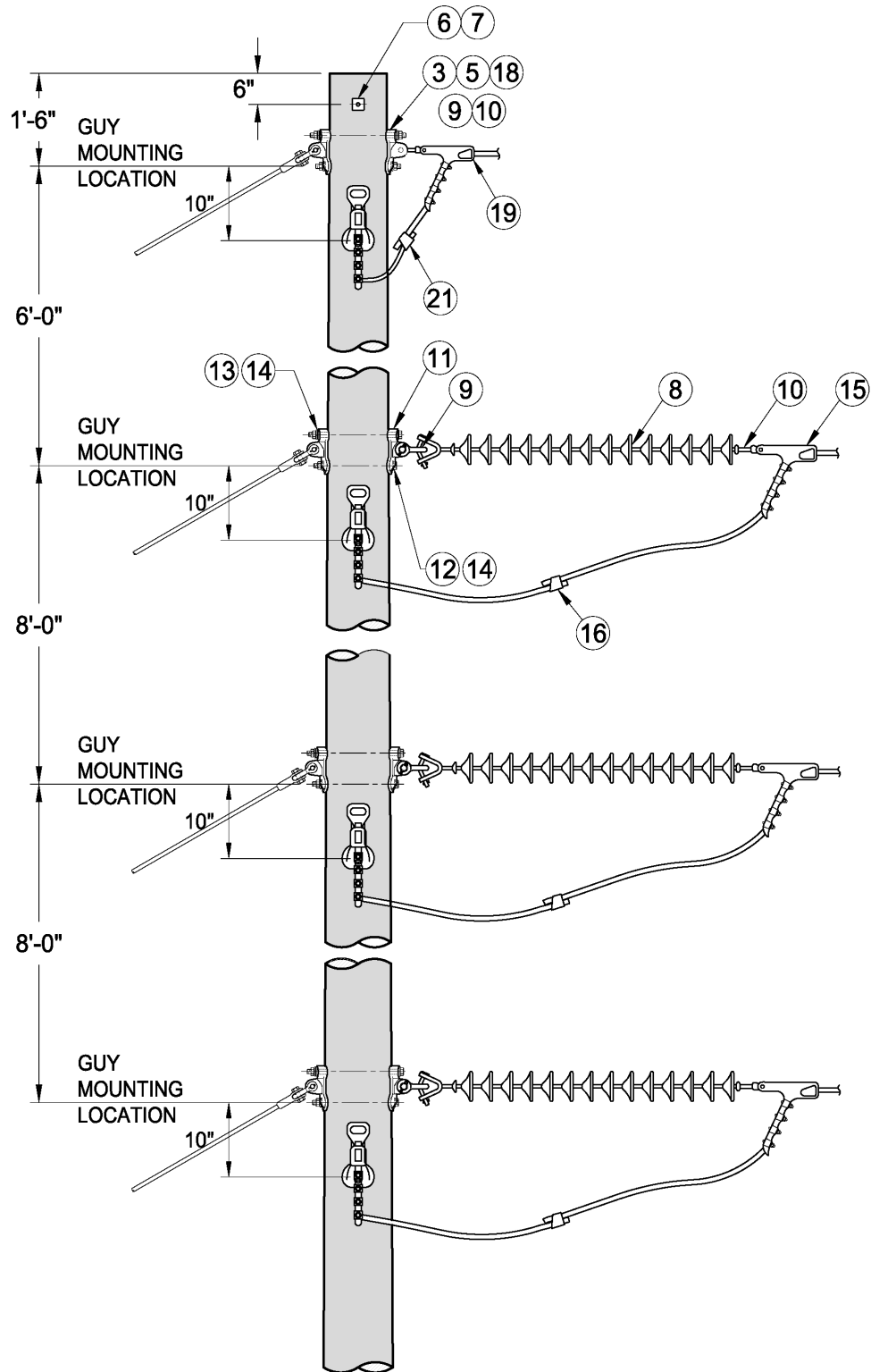
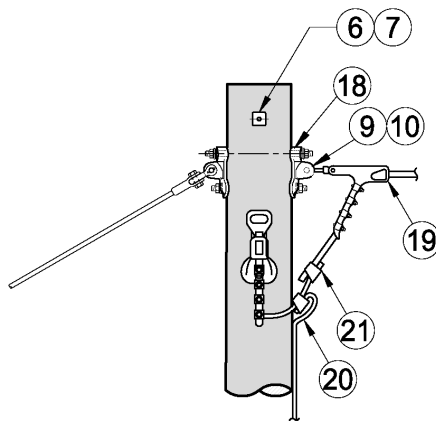


Figure 3i. Static Wire Deadend Framing Details



4. Construction Notes

Guy mounting locations are shown in figures 3a–3i. Guying calculations are required to determine guying requirements. The SCL Design Engineer will specify the sizes and number of down guys based on conductor design tension, line angle, and down guy lead length. See SCL 0199.01 for guying installation fundamentals.

Anchor selection is specified by the SCL Design Engineer based on line loading, soil class, and holding strength requirements.

Install machine bolts with heads on the insulator side and nuts, washers, and threads on the pole side.

Bolt lengths will vary depending on the installation height and thickness of the pole line hardware. Bolts should be of the required length to fit the pole diameter at each point of installation. Bolts specified in the material list (Section 5) are sized appropriately for most installation points. No more than two inches of bolt thread should be exposed after installation. Crews are encouraged to have a small supply of shorter lengths on hand for instances in which bolt length is excessive.

Install double coil spring washers on the threaded end of machine bolts.

Two set of wedge taps are provided in the material list for 795 and 954 kcmil AAC to accommodate the size of either conductor. Use appropriate taps and return the others to the the warehouse.

Contact the SCL Design Engineer for concerns regarding the following:

- Poor soil conditions
- Avian and wildlife
- Salt spray
- Clearances
- Guying

The static wire framing assembly is intended for Alumoweld 7-#6 AWG or 7/16-in Aluminum-covered 20M wire.

5. Material List

Table 5a. Materials for 115 kV Vertical Deadend Pole Top Assemblies, Without Static Wire

Fig	Compatible Unit	ID	Quantity		
3a	115 kV Vertical Deadend (In-Line)	TBD			
3c	115 kV Vertical Double Deadend (15°–60°)	TBD			
3f	115 kV Vertical Double Deadend (60°–120°)	TBD			
#	Material Description	ID			
1	Insulator, 115 kV, horizontal line post, polymer,	690189	–	3	–
2	Clamp, trunnion, line post (1.0"–1.5")	695194	–	3	–
3	Bolt, machine, galvanized, sq. head, 3/4" x 22"	780880	–	6	–
4	Washer, square curved, 4" x 4"	584775	–	6	–
5	Washer, double coil lock, helical, 3/4"	584267	–	6	–
6	Bolt, machine, galvanized, 5/8" x 18"	780848	1	1	1
7	Washer, square flat, galvanized, 5/8", 2-1/4"	585135	1	1	1
8	Insulator, suspension, polymer, 115 kV	690237	6	6	3
9	Fitting, Y-clevis ball	695525	6	6	3
10	Fitting, socket eye	696020	–	–	–
11	Plate, pole eye, 7/8"	565199	12	12	6
12	Bolt, machine, galvanized, square head, 7/8",	012643	12	12	6
13	Washer, double coil lock, helical, 7/8"	012651	12	12	6
14	Washer, round flat, 7/8", 2-1/4"	585040	24	24	12
15	Clamp, quadrant strain, Al (477–954 ACSR)	693825	6	6	–
16	Connector, wedge taps, 954:954	013624	3	3	–
16	Connector, wedge taps, 795:795	013626	3	3	–
17	Washer, round flat, galvanized, 3/4", 2"	585035	–	6	–

Table 5b. Materials for 115 kV Vertical Deadend Pole Top Assemblies, With Static Wire

Fig	Compatible Unit	ID	Quantity		
3b, 3i	115 kV Vertical Deadend (In-Line)	TBD			
3d, 3e, 3i	115 kV Vertical Double Deadend (15°–60°)	TBD			
3g, 3h, 3i	115 kV Vertical Double Deadend (60°–120°)	TBD			
#	Material Description	ID			
1	Insulator, 115 kV, horizontal line post,	690189	–	3	–
2	Clamp, trunnion, line post (1.0"–1.5")	695194	–	3	–
3	Bolt, machine, galvanized, sq. head, 3/4" x	780880	4	10	2
4	Washer, square curved, 4" x 4"	584775	–	6	–
5	Washer, double coil lock, helical, 3/4"	584267	4	10	2
6	Bolt, machine, galvanized, 5/8" x 18"	780848	1	1	1
7	Washer, square flat, galvanized, 5/8", 2-1/4"	585135	1	1	1
8	Insulator, suspension, polymer, 115 kV	690237	6	6	3
9	Fitting, Y-clevis ball	695525	8	8	4
10	Fitting, socket eye	696020	–	–	–
11	Plate, pole eye, 7/8"	565199	12	12	6
12	Bolt, machine, galvanized, square head, 7/8",	012643	12	12	6
13	Washer, double coil lock, helical, 7/8"	012651	12	12	6
14	Washer, round flat, 7/8", 2-1/4"	585040	24	24	12
15	Clamp, quadrant strain, Al (477–954 ACSR)	693825	6	6	–
16	Connector, wedge taps, 954:954	013624	3	3	–
16	Connector, wedge taps, 795:795	013626	3	3	–
17	Washer, round flat, galvanized, 3/4", 2"	585035	–	6	–
18	Plate, pole eye, 3/4"	565198	4	4	2
19	Clamp, Quadrant Strain, Deadend (1/0–300	693370	2	2	1
20	Connector, 2-bolt taps, static wire jumper	669379	1	1	1
21	Connector, Wedge Taps, Static Wire 2/0:2/0	013610	1	1	–

6. References

- SCL Construction Standard 0462.10;** Grounding Electrodes for Overhead Ground Wire (OHGW)
- SCL Construction Standard 0199.01;** “Requirements for Guying and Anchoring”
- SCL Construction Standard 1621.10;** “115 kV Angle Pole Top Assemblies”
- SCL Construction Standard 1621.30;** “115 kV Deadend Pole Top Assemblies”

7. Sources

Allen, Skip; SCL Field Operations Supervisor and subject matter expert for 1621.30 (skip.allen@seattle.gov)

Caddy, Tom; SCL Field Operations Supervisor and subject matter expert for 1621.30 (tom.caddy@seattle.gov)

Lin, Jimmy; SCL Engineer and subject matter expert for 1621.30 (jimmy.lin@seattle.gov)

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

Neuansourinh, Ponet; SCL Standards Engineer, subject matter expert, and originator of 1621.30 (ponet.neuansourinh@seattle.gov)