
Three-Phase Armless Tangent Pole Top Assemblies

1. Scope

This standard covers the information necessary to construct the pole top assemblies for two- and three-phase armless tangent poles supporting #4 AWG copper, 397.5 kcmil ACSR, or 954 kcmil ACSR primary conductors on the 26 kV primary distribution system. Installation instructions for connecting the primary conductor to the pole are included, along with requirements for vertical spacing and hardware.

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

Grade of construction	B and C
Pole class	1 or stronger
Pole length	50 ft
Soil condition	Average
Allowable line angle	0°–3°

For line angles greater than the allowable line angles described above, refer to SCL 0104.03.

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

2. Application

This standard provides direction to SCL engineers, crews, and contractors for the installation of two- and three-phase armless tangent pole top assemblies on 26 kV distribution poles with #4 AWG copper, 397.5 kcmil ACSR, or 954 kcmil ACSR conductors.

3. General Requirements

Armless poles shall be used only when absolutely required or upon request of SCL management. The typical use for an armless pole is for locations where a crossarm construction cannot be used because of clearance issues.

Three-phase armless tangent pole tops can be constructed in the A-frame or vertical configuration.

Three-phase armless poles shall be constructed as shown in Table 3.



Table 3. Three-Phase Armless Tangent Pole Tops

Conductor Size	Armless Type	Allowable Line Angle	Figure
#4 AWG	A-frame	0°	3a, 3b
#4 AWG	vertical	0°	3e, 3f
397.5 kcmil	A-frame	0°	3a, 3b
397.5 kcmil	vertical	0°	3e, 3f
954 kcmil	A-frame	0°–3°	3c, 3d
954 kcmil	vertical	0°–3°	3g, 3h

Two-phase armless poles shall be constructed as three-phase armless poles without the center phase for an A-frame or without the bottom phase for the vertical configuration.

The #4 AWG copper and 397.5 kcmil ACSR armless A-frame and vertical poles shall not have an angle because of side-tie limitations.

The highest communication attachment shall be located at a minimum of 40 in below the secondary and neutral and a minimum of 10 ft below the top of the transformer.

Figure 3a. Three-Phase #4 AWG Copper and 397.5 kcmil ACSR Armless A-frame Tangent Pole, Top View

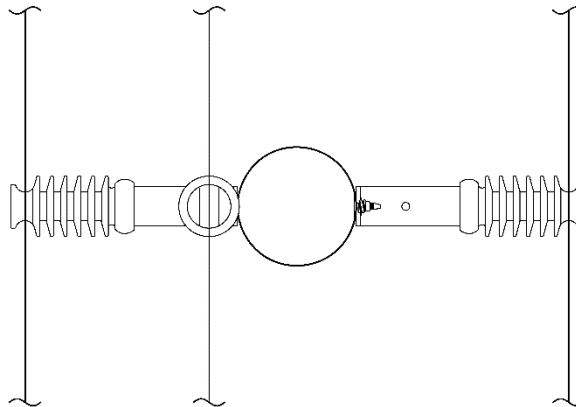


Figure 3b. Three-Phase #4 AWG Copper and 397.5 kcmil ACSR Armless A-frame Tangent Pole, Side View

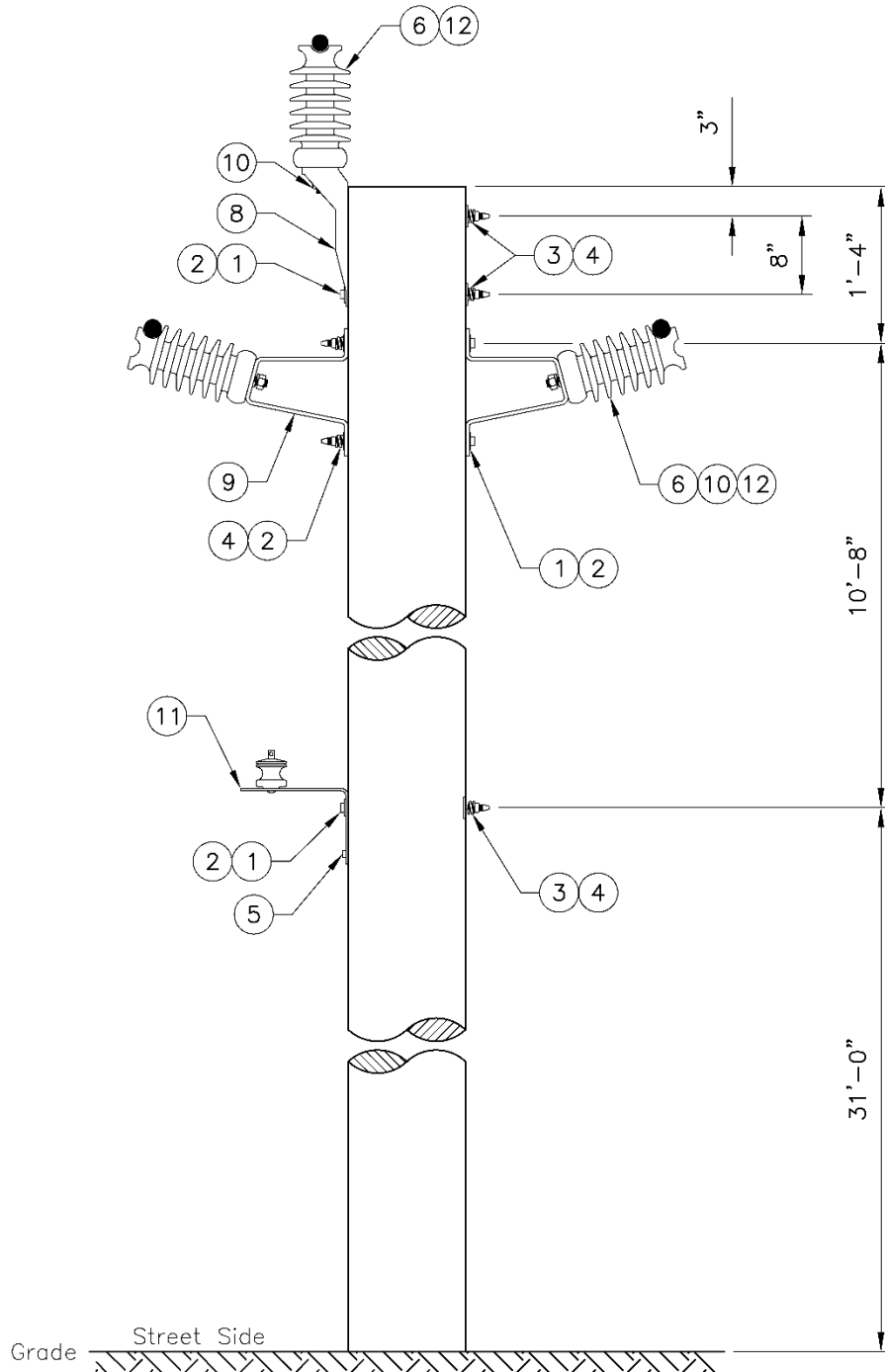


Figure 3c. Allowable Line Angle Range 0°–3° for a 954 kcmil ACSR Armless A-frame Tangent Pole

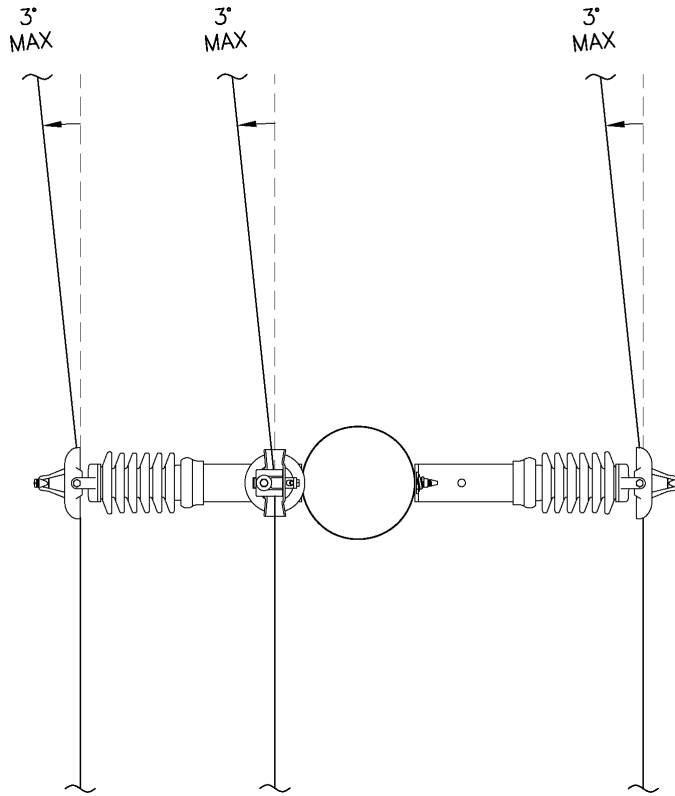


Figure 3d. Three-Phase 954 kcmil ACSR Armless A-frame Tangent Pole Top Assembly

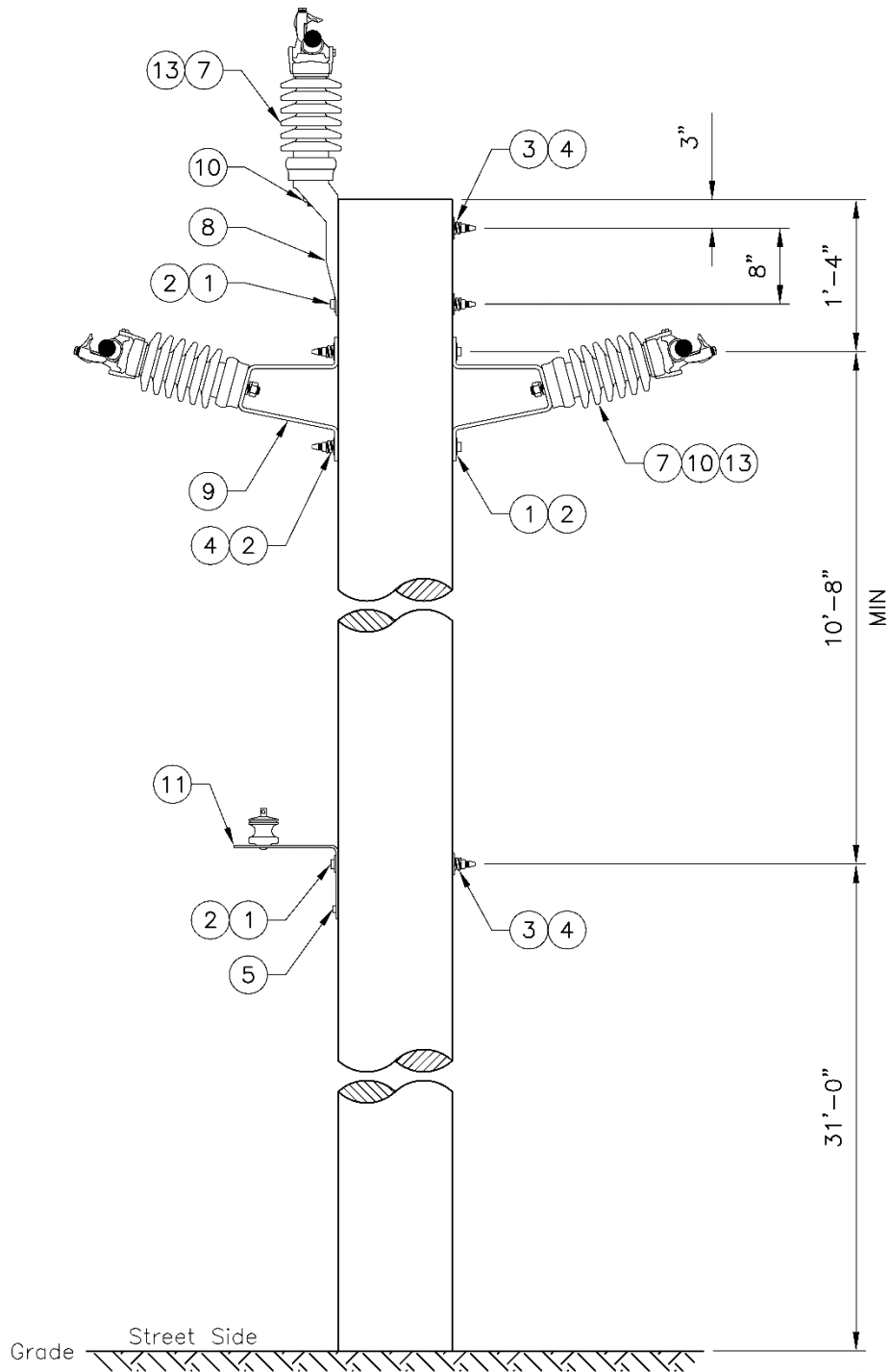


Figure 3e. Three-Phase #4 AWG Copper and 397.5 kcmil ACSR Armless Vertical Tangent Pole, Top View

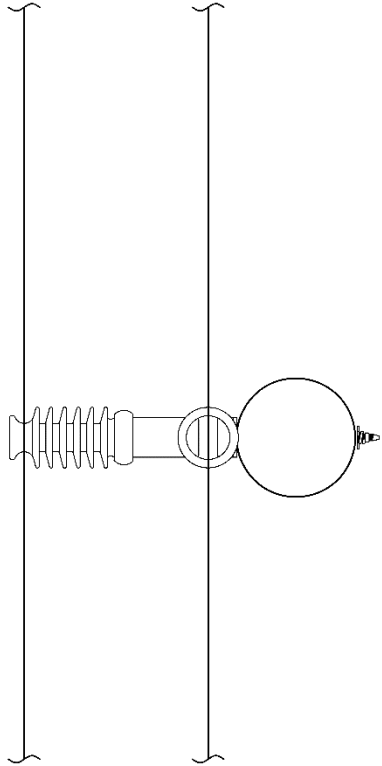


Figure 3f. Three-Phase #4 AWG Copper and 397.5 kcmil ACSR Armless Vertical Tangent Pole, Side View

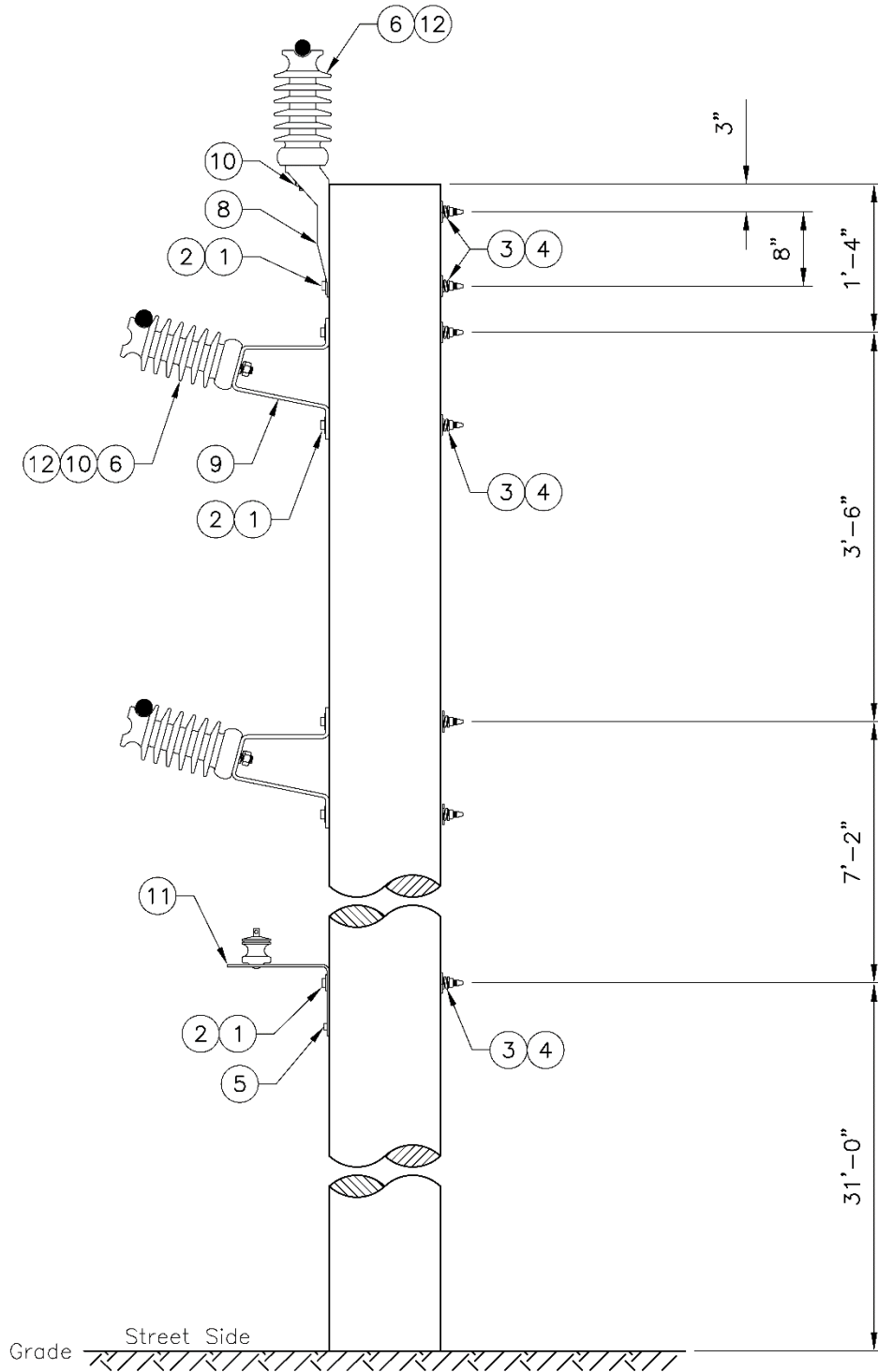


Figure 3g. Allowable Line Angle Range 0°–3° for a 954 kcmil ACSR Armless Vertical Tangent Pole

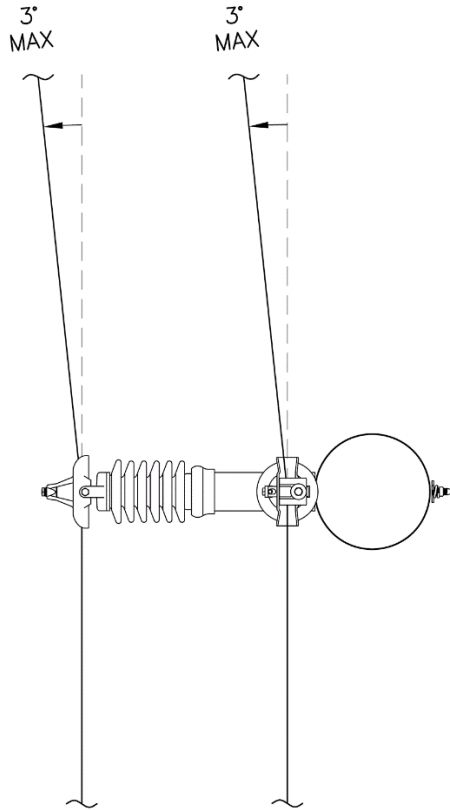
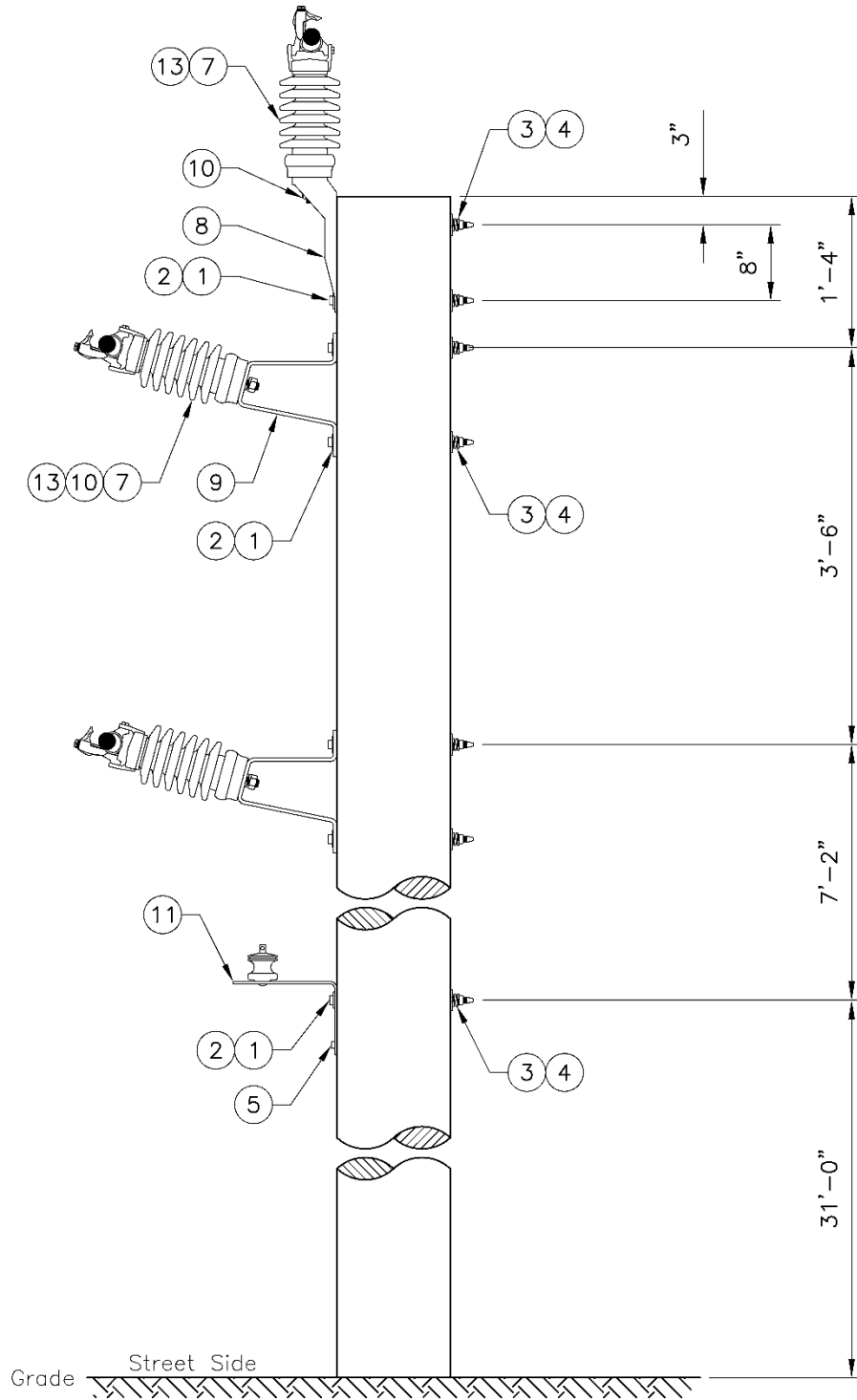


Figure 3h. Three-Phase 954 kcmil ACSR Armless Vertical Tangent Pole



4. Construction Notes

If two neutrals are required, mount the second neutral on the street side 1 ft below the top bolt hole of the original neutral (typically at 30 ft).

If poor soil is found in the field, contact the SCL Design Engineer.

If there are avian and wildlife concerns, contact the SCL Design Engineer.

If there are salt spray concerns, contact the SCL Design Engineer.

5. Material List

Table 5a. Materials for Three-Phase Armless Tangent Pole Top Assemblies

Fig	Compatible Unit	ID	Quantity					
3b	Three-phase #4 AWG copper armless A-frame tangent	PLT#4-3A-FRAME						
3b	Three-phase 397.5 ACSR armless A-frame tangent	PLT397-A-FRAME						
3d	Three-phase 954 ACSR armless A-frame tangent	PLT954-A-FRAME						
3f	Three-phase #4 AWG copper armless vertical tangent	PLT#4-3VERT						
3f	Three-phase 397.5 ACSR armless vertical tangent	PLT397-VERT						
3h	Three-phase 954 ACSR armless vertical tangent	PLT954-VERT						
#	Material Description	ID	▼	▼	▼	▼	▼	▼
1	Bolt, machine, galvanized, 5/8" x 14"	780846	7	7	7	5	5	5
2	Washer, round, flat, 5/8"	585030	7	7	7	7	7	7
3	Washer, square, flat, 2-1/4" x 2-1/4"	585135	7	7	7	3	3	3
4	Washer, spring, 5/8"	584261	7	7	7	5	5	5
5	Screw, lag, 1/2" x 4"	785259	1	1	1	1	1	1
6	Insulator, post top 34.5 kV tie-top	690157	–	3	3	–	3	3
7	Insulator, post top 34.5 kV clamp-top	690159	3	–	–	3	–	–
8	Bracket, pole top	563253	1	1	1	1	1	1
9	Bracket, insulator pin	580510	2	2	2	2	2	2
10	Stud, short 3/4" x 1-3/4"	696826	3	3	3	3	3	3
11	LR bracket	690404	1	1	1	1	1	1
12	Wire, tie, insulator, #6 soft drawn, CU (Feet)	610210	–	–	9	–	–	9
12	Tie, insulator, 0.756"–0.855" top-tie	658979	–	1	–	–	1	–
12	Tie, insulator, 0.668"–0.755" side-tie	658991	–	2	–	–	2	–
13	Clamp, trunnion, line post, for ACSR and AAC	695196	3	–	–	3	–	–

Table 5b. Materials for Two-Phase Armless Tangent Pole Top Assemblies

Fig	Compatible Unit	ID	Quantity	
3b	Two-phase #4 AWG copper armless A-frame tangent	PLT#4-2A-FRAME		
3f	Two-phase #4 AWG copper armless vertical tangent	PLT#4-2VERT		
#	Material Description	ID		
1	Bolt, machine, galvanized, 5/8" x 14"	780846	5	3
2	Washer, round, flat, 5/8"	585030	5	5
3	Washer, square, flat, 2-1/4" x 2-1/4"	585135	5	1
4	Washer, spring, 5/8"	584261	5	3
5	Screw, lag, 1/2" x 4"	785259	1	1
6	Insulator, post top 34.5 kV tie-top	690157	2	2
7	Bracket, pole top	563253	1	–
8	Bracket, insulator pin	580510	2	2
9	Stud, short 3/4" x 1-3/4"	696826	2	2
10	LR bracket	690404	1	1
11	Wire, tie, insulator, #6 soft drawn, CU (Feet)	610210	6	6

6. References

SCL Construction Standard 0104.03, "Three-Phase Armless Angle Pole Top Assembly"

7. Sources

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

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