
Three-Phase Overhead Jumpers, Unfused

1. Scope

This standard covers the information necessary to install unfused jumpers on the 26 kV primary distribution system. Requirements for jumper size and hardware, and installation instructions to connect the jumpers between conductors, are included.

2. Application

This standard provides direction to Seattle City Light (SCL) engineers, crews, and contractors for the installation of unfused jumpers on 26 kV distribution primary (#4 AWG copper, 397.5 kcmil ACSR, and 954 kcmil ACSR) conductors.

For installing fused jumpers, refer to SCL 0100.25.

3. Requirements

Jumpers connect two conductors on the same feeder that have been separated, typically at double deadends, large angles, corners, and laterals on different gains.

Jumper conductors at structures shall not limit the ampacity of the main line and will use a minimum conductor size of the smaller of the two conductors being jumped.

Long jumpers or jumpers with a large radius shall use insulators to maintain clearances. For the SCL 26 kV system, the jumpers shall maintain a minimum 24-inch clearance from the center of the pole. The jumper shall also maintain a minimum of 7.3 inches from another phase of the same circuit or 12.9 inches from another phase of a different circuit.

When connecting dissimilar metals, use the proper wedge connector or stirrup.

Jumper conductors shall run parallel to the line conductor for 18 inches to provide space for installing the wedge connector.

The jumpers may come in two phasing configurations. The normal configuration is 123-123 and the alternate configuration is 123-321.

Two-phase jumpers shall be constructed as three-phase jumpers without the center phase.

Use Table 3 to determine the proper jumper to use, and the jumper shall be constructed as shown in the referenced figure.



Table 3. Three-Phase Jumper Application

| Phase | Type | Gain | Angle | Figures |
|-------|--------------------|------|---------|-------------|
| 3 | Deadend to Deadend | 1 | 0-60 | 3a, b |
| 3 | Deadend to Deadend | 2 | 0-30 | 3c, d |
| 3 | Deadend to Deadend | 2 | 30-60 | 3e, f |
| 3 | Deadend to Deadend | 2 | 60-100 | 3g, h, i, j |
| 3 | Deadend to Deadend | 2 | 100-150 | 3k, l |
| 3 | Tangent to Deadend | 2 | 0-60 | 3m, n |
| 3 | Tangent to Deadend | 2 | 60-100 | 3o, p, q, r |
| 3 | Tangent to Deadend | 2 | 100-180 | 3s, t |
| 3 | Tangent to Tangent | 2 | All | 3u, v |
| 3 | Flying Tap | 2 | All | 3w |

Figure 3a. Three-Phase Single Gain Double Deadend 3 LPI Jumper, Top View

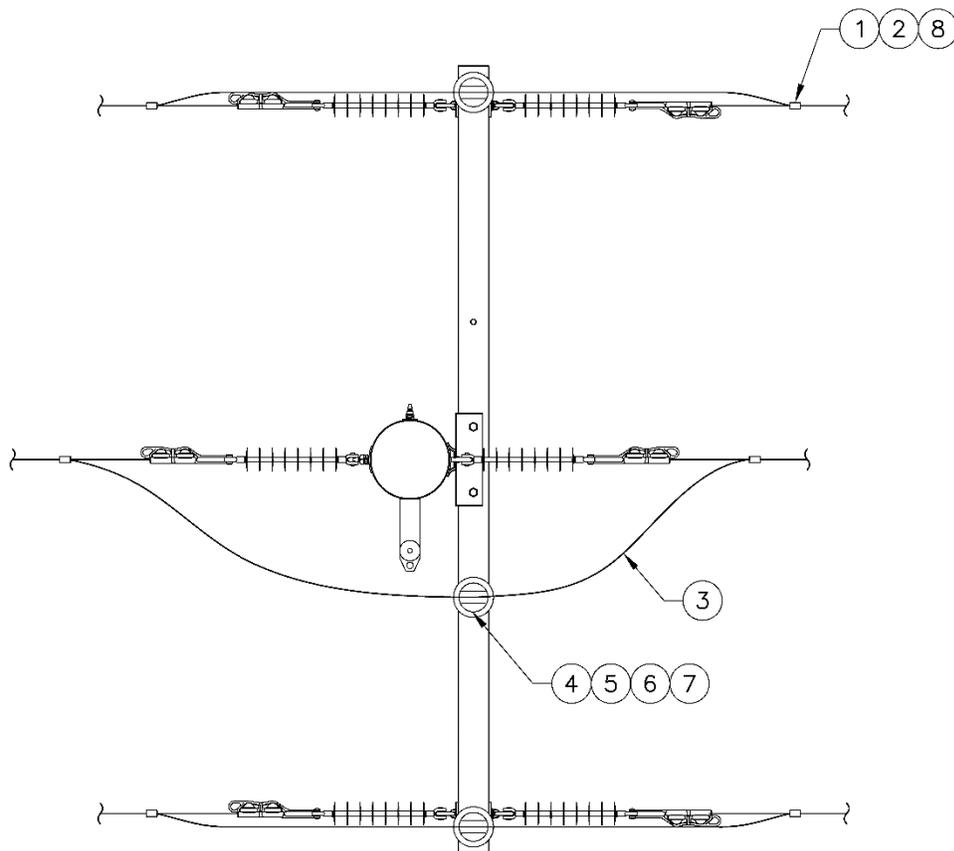


Figure 3b. Three-Phase Single Gain Double Deadend 3 LPI Jumper, Side View

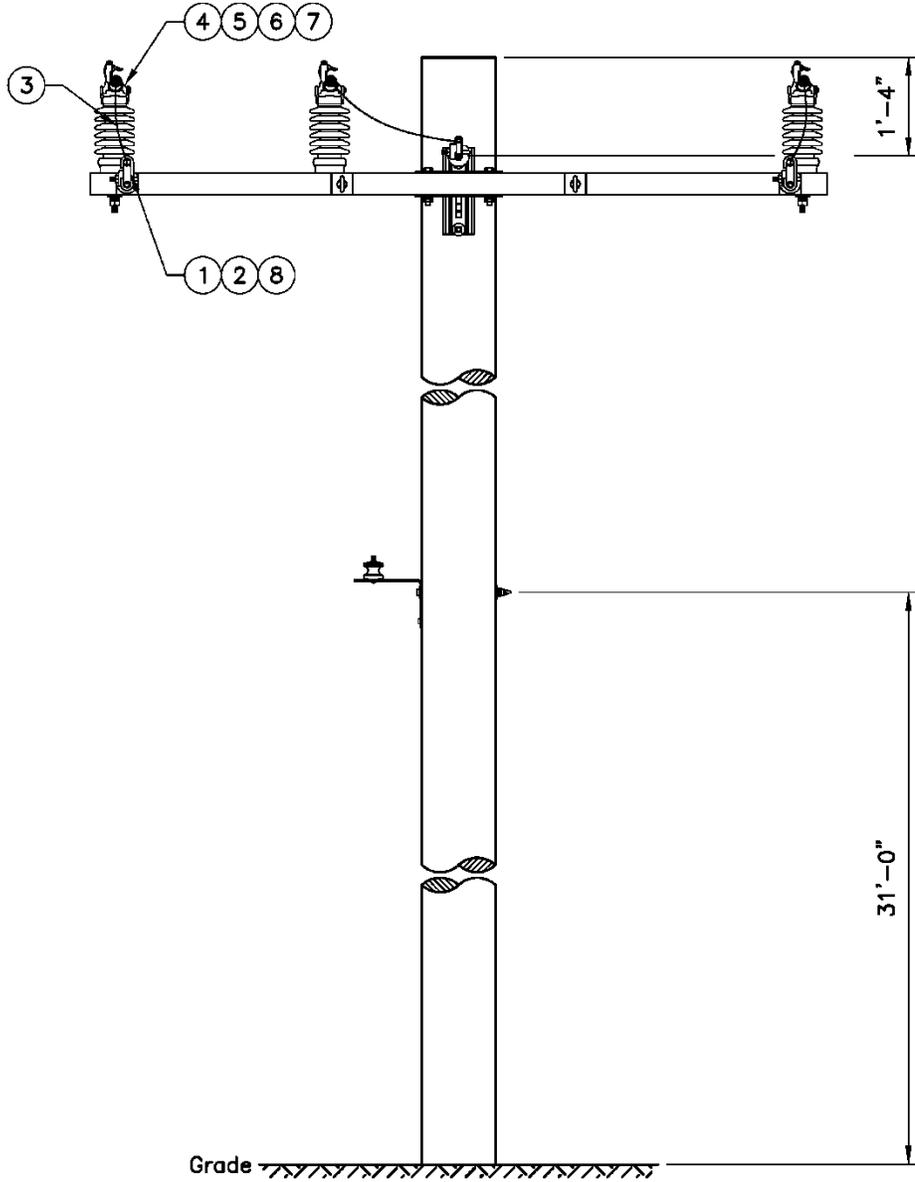


Figure 3c. Three-Phase Multi-Gain 0°-30° Deadend to Deadend 3 LPI Jumper, Top View

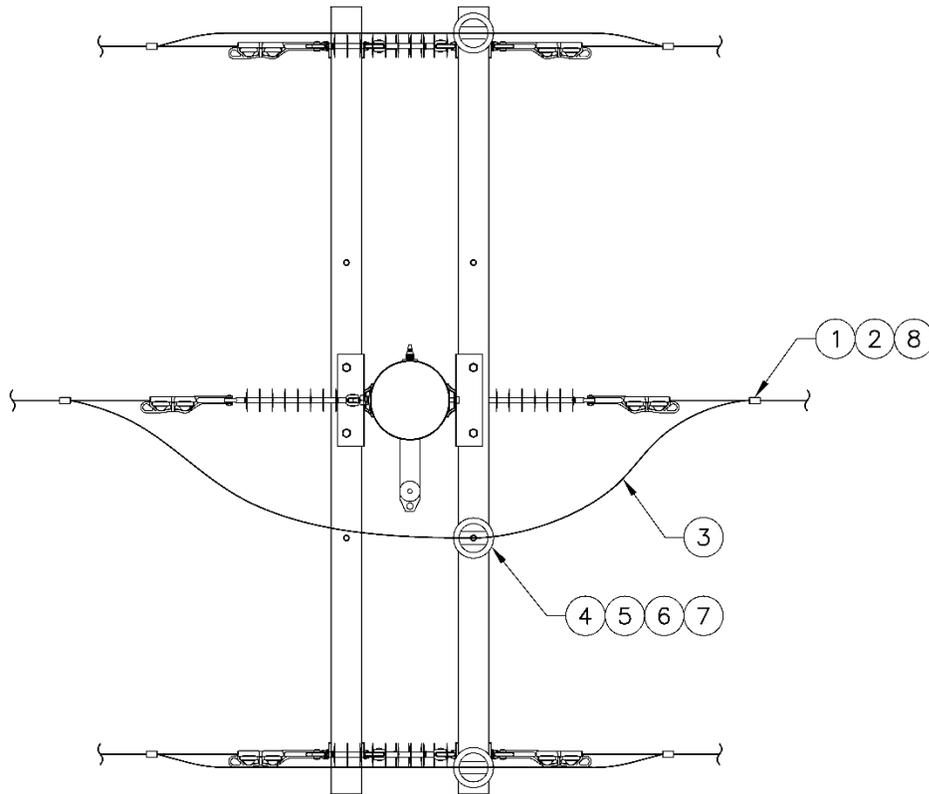


Figure 3d. Three-Phase Multi-Gain 0°-30° Deadend to Deadend 3 LPI Jumper, Side View

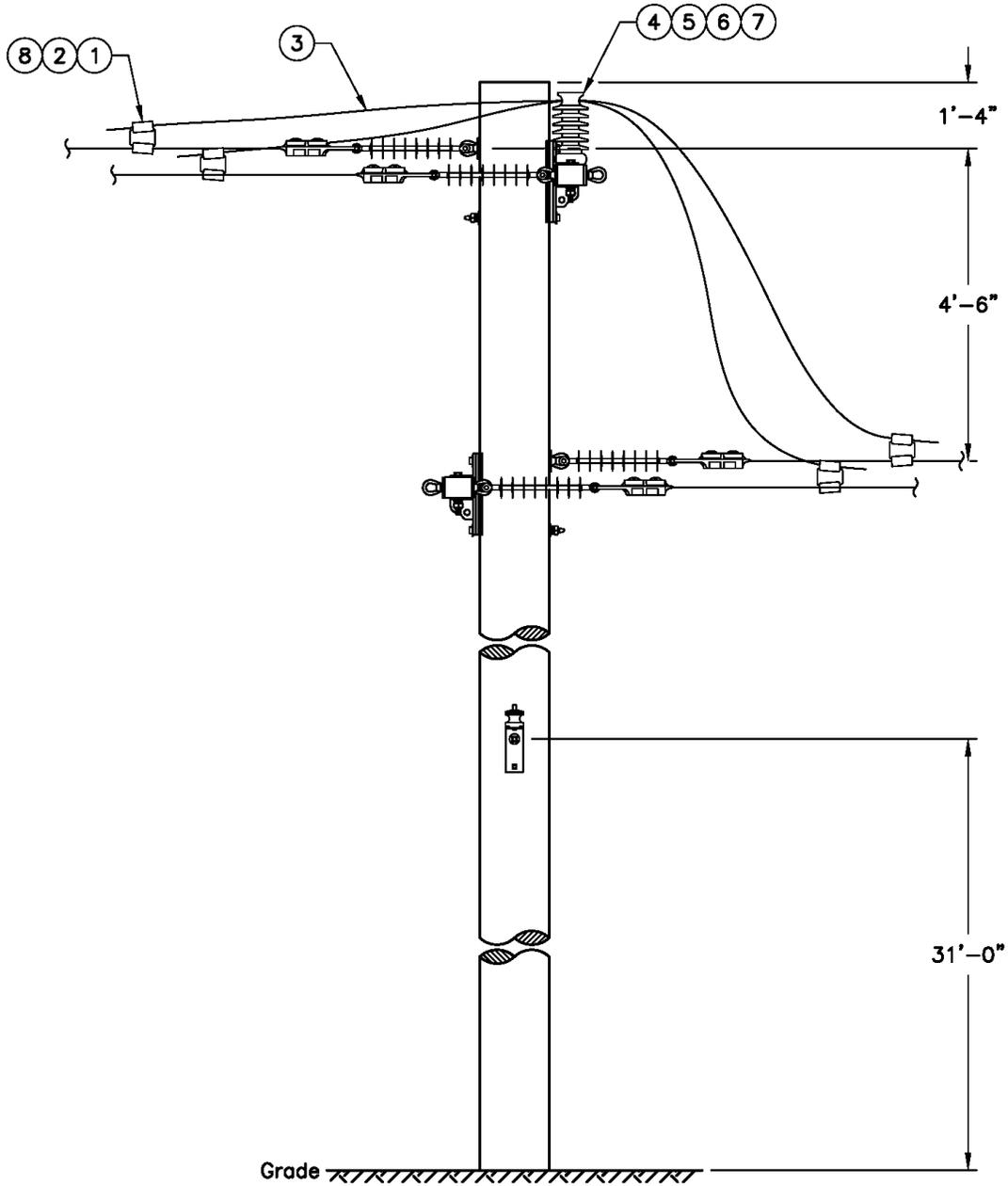


Figure 3f. Three-Phase Multi-Gain 30°-60° Deadend to Deadend 2 LPI Jumper, Side View

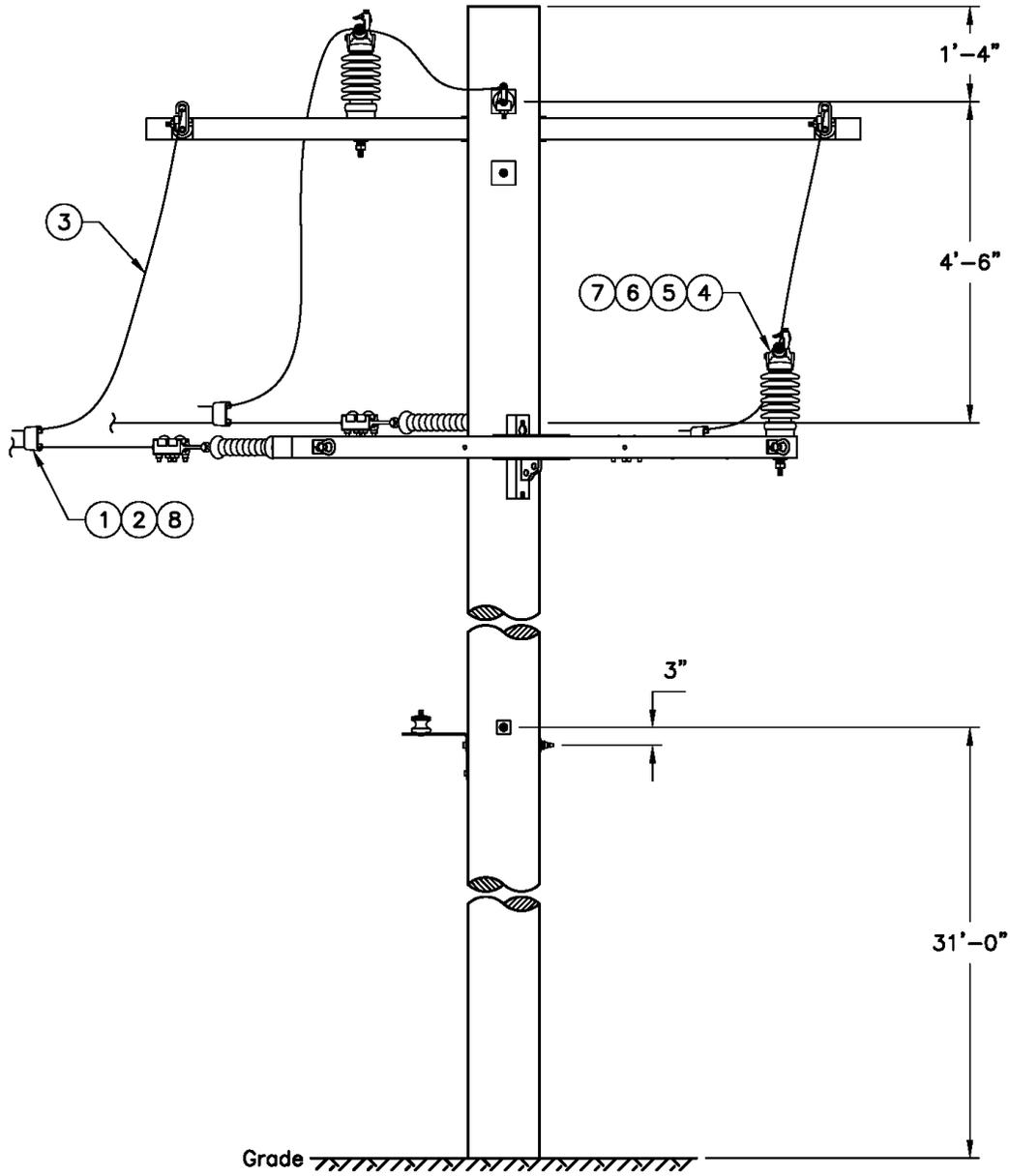


Figure 3g. Three-Phase Multi-Gain 60°-100° Deadend to Deadend 3 LPI Jumper, Normal, Top View

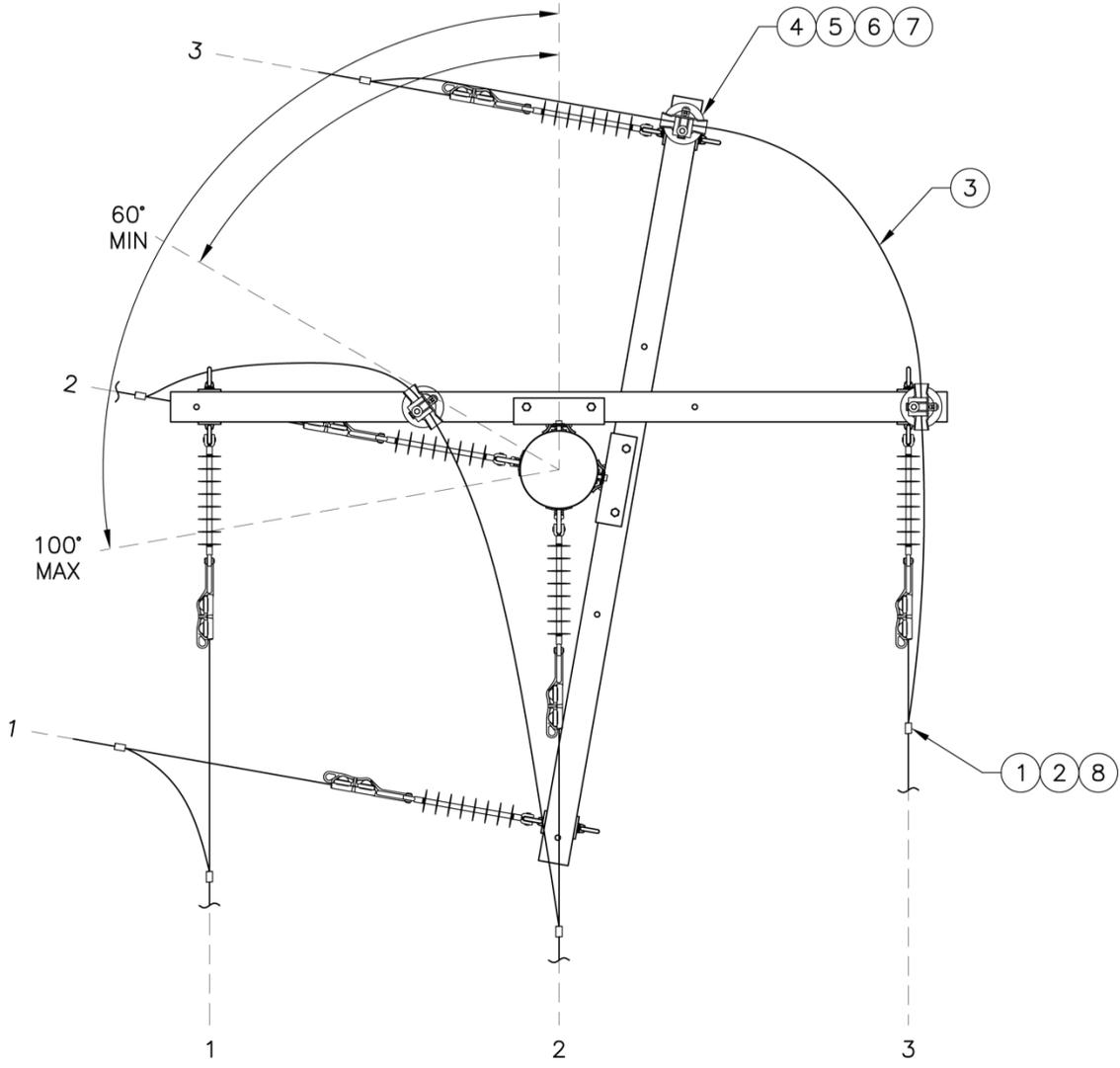


Figure 3h. Three-Phase Multi-Gain 60°-100° Deadend to Deadend 3 LPI Jumper, Normal, Side View

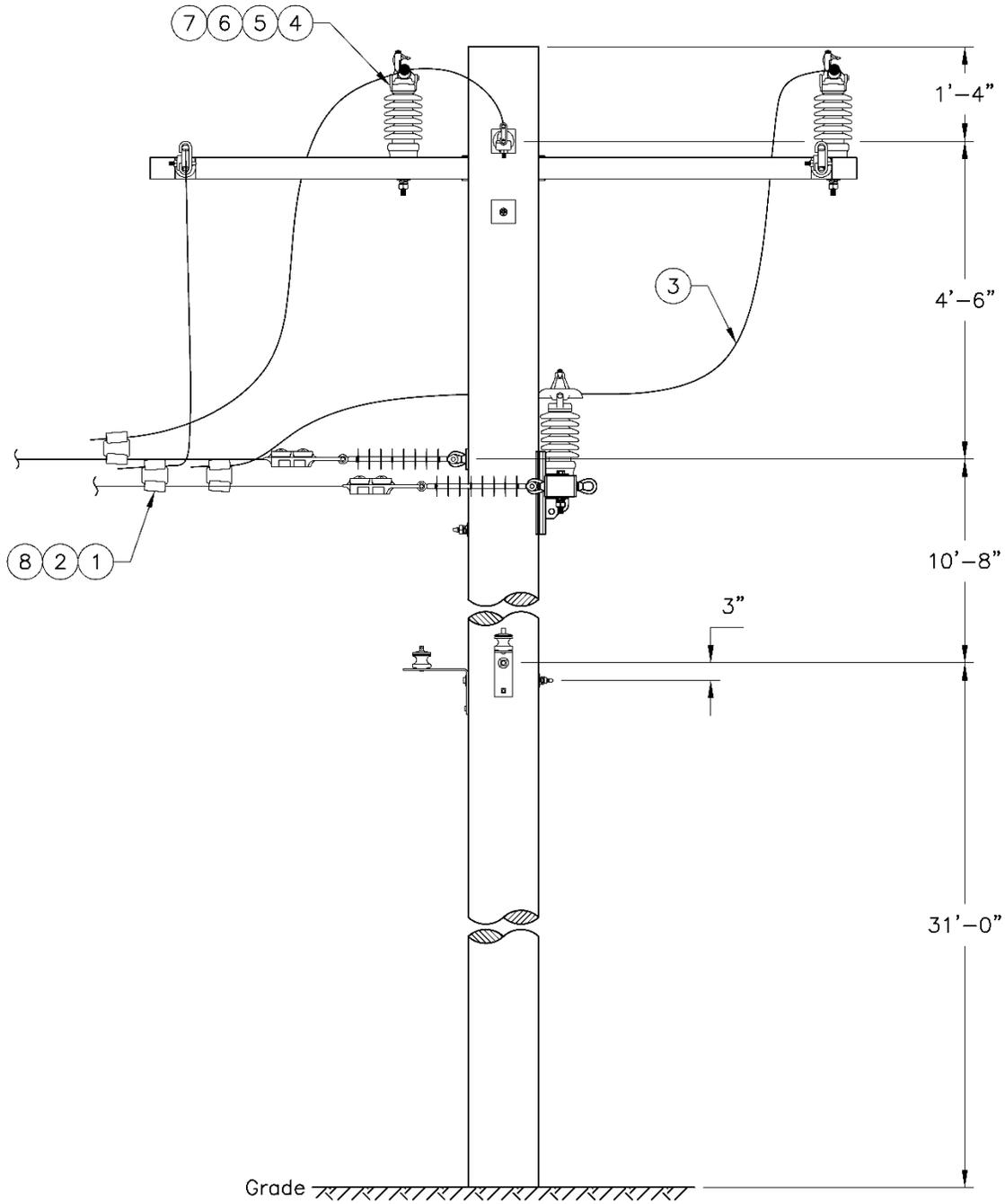


Figure 3i. Three-Phase Multi-Gain 60°-100° Deadend to Deadend 3 LPI Jumper, Alternate, Top View

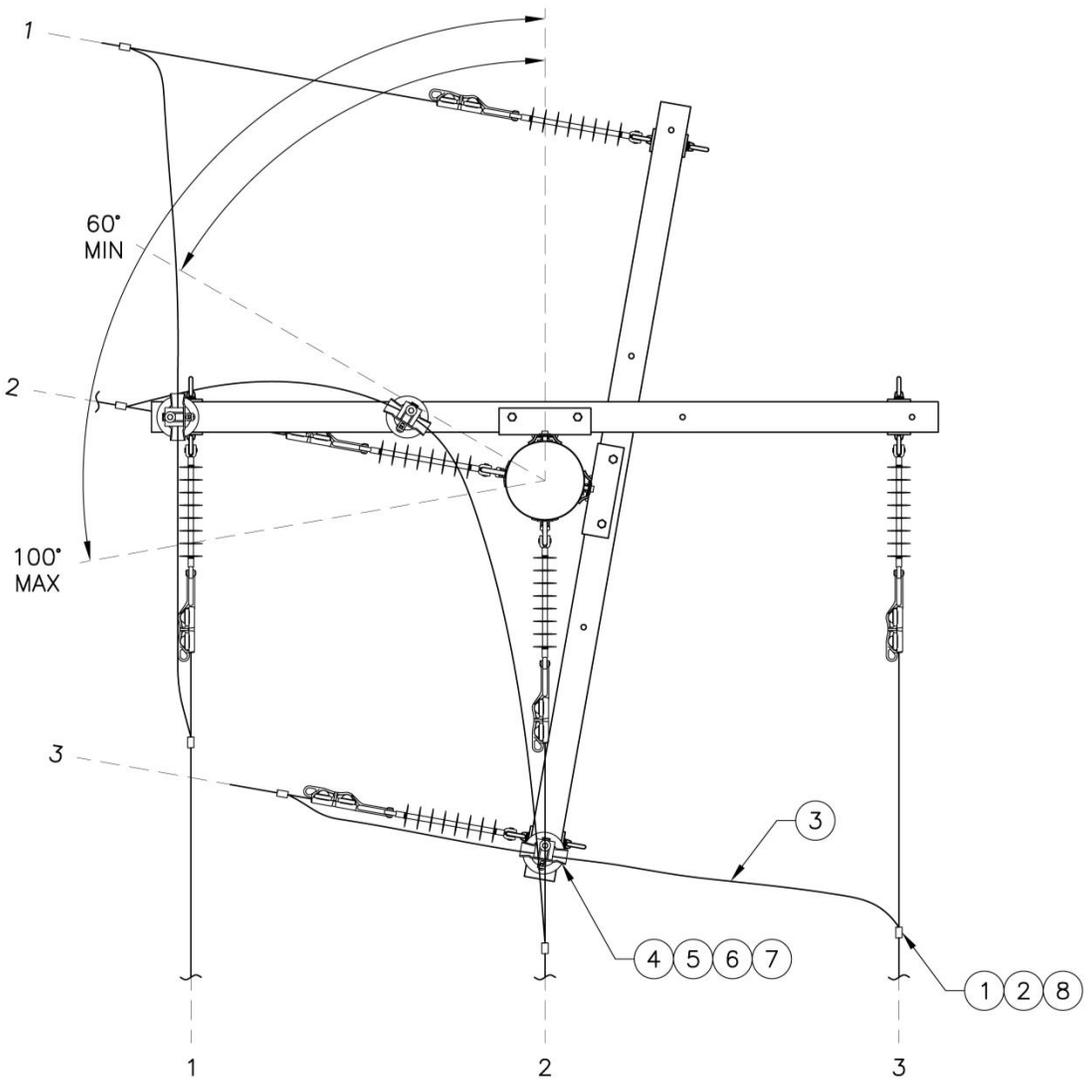


Figure 3j. Three-Phase Multi-Gain 60°-100° Deadend to Deadend 3 LPI Jumper, Alternate, Side View

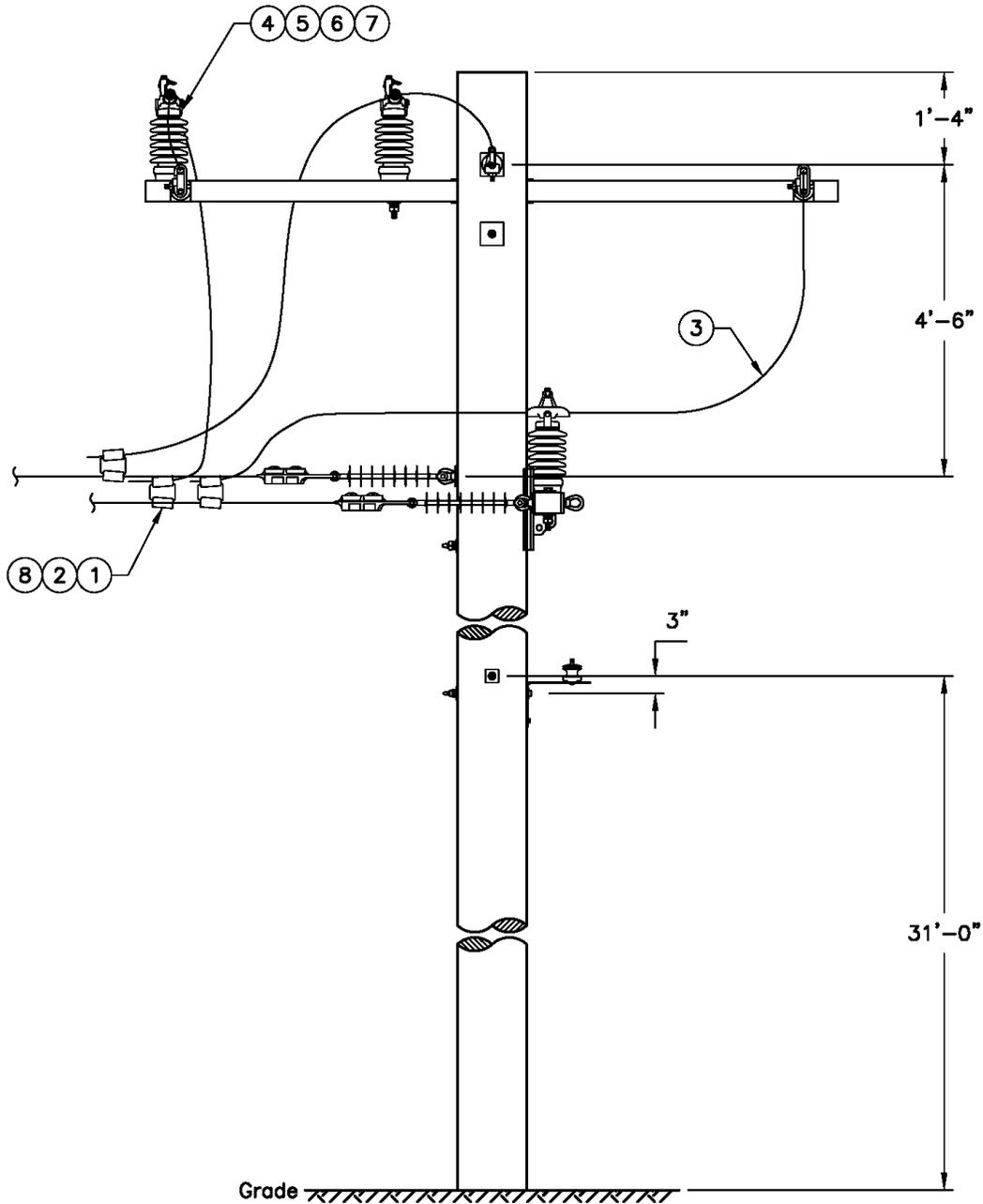


Figure 3k. Three-Phase Multi-Gain 100°-180° Deadend to Deadend No LPI Jumper, Top View

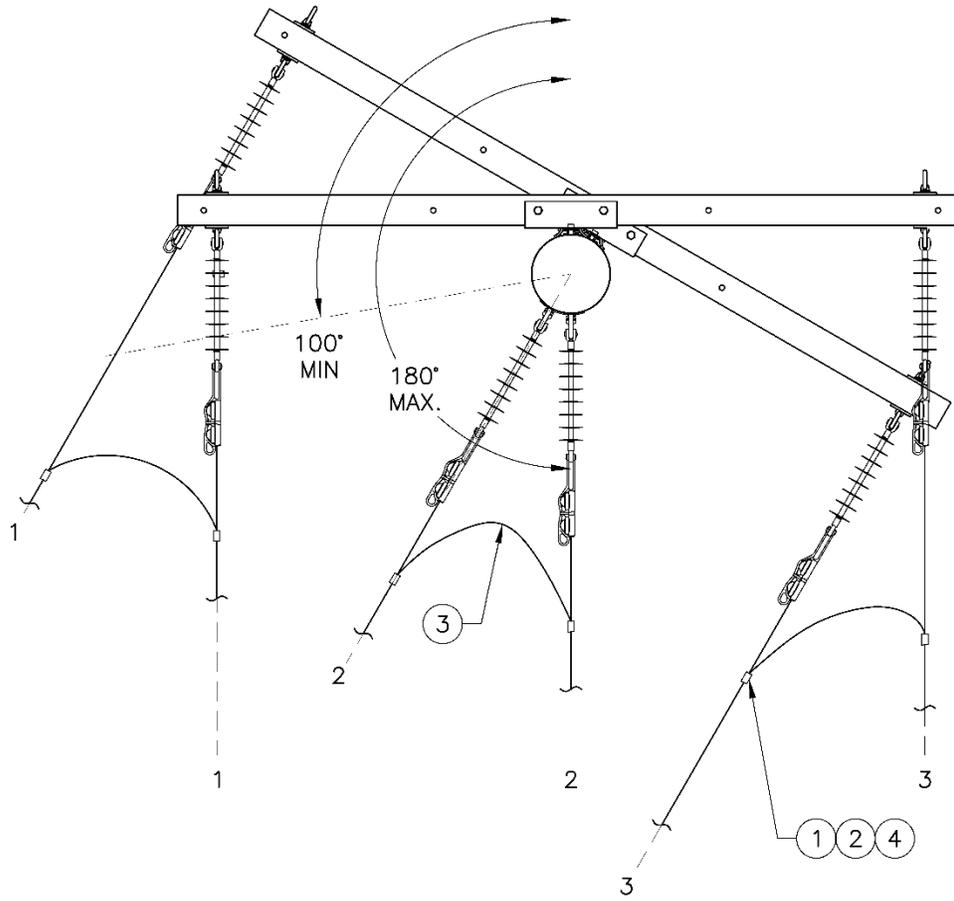


Figure 3I. Three-Phase Multi-Gain 100°-180° Deadend to Deadend No LPI Jumper, Side View

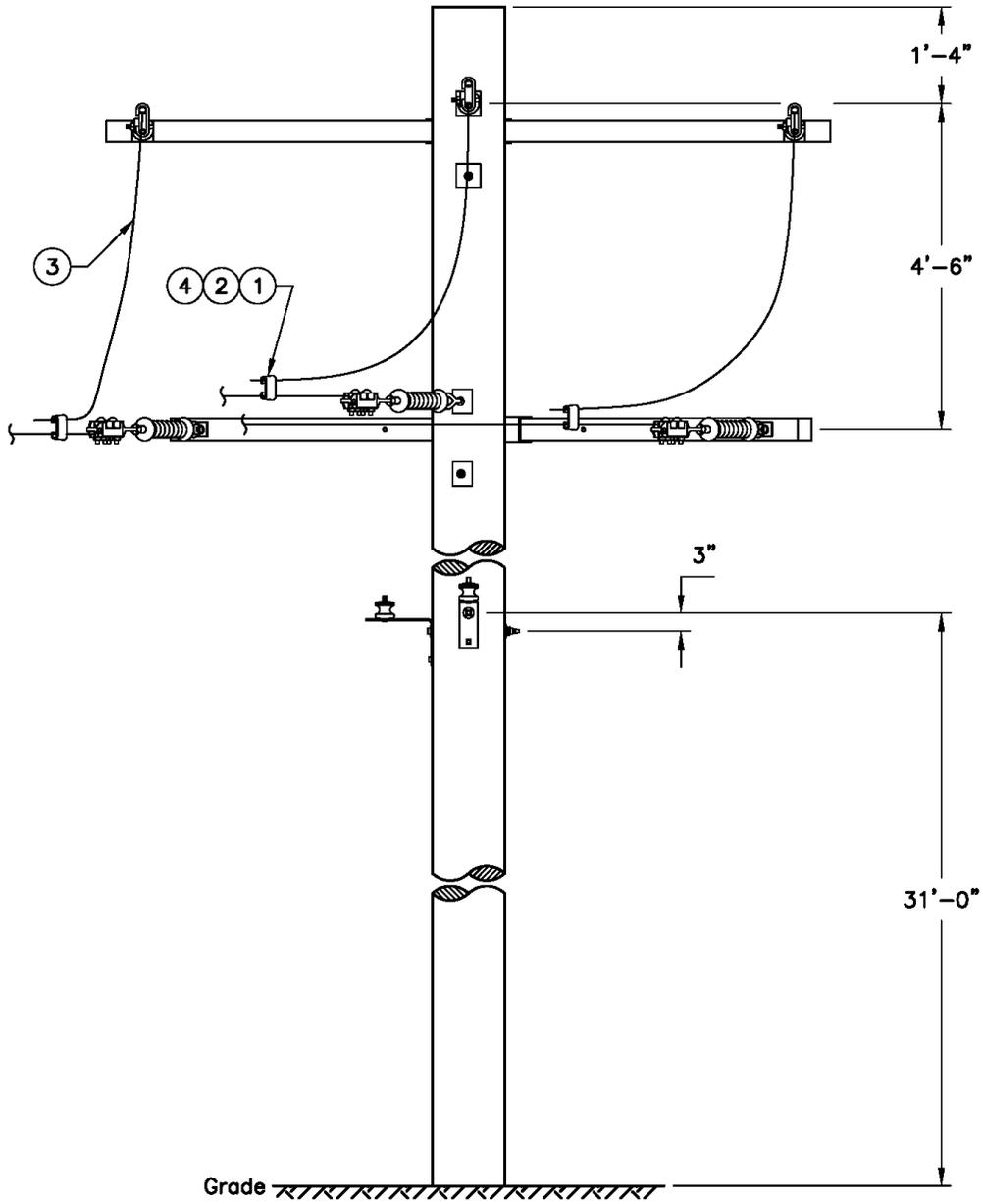


Figure 3m. Three-Phase Multi-Gain 0°-60° Tangent to Deadend 2 LPI Jumper, Top View

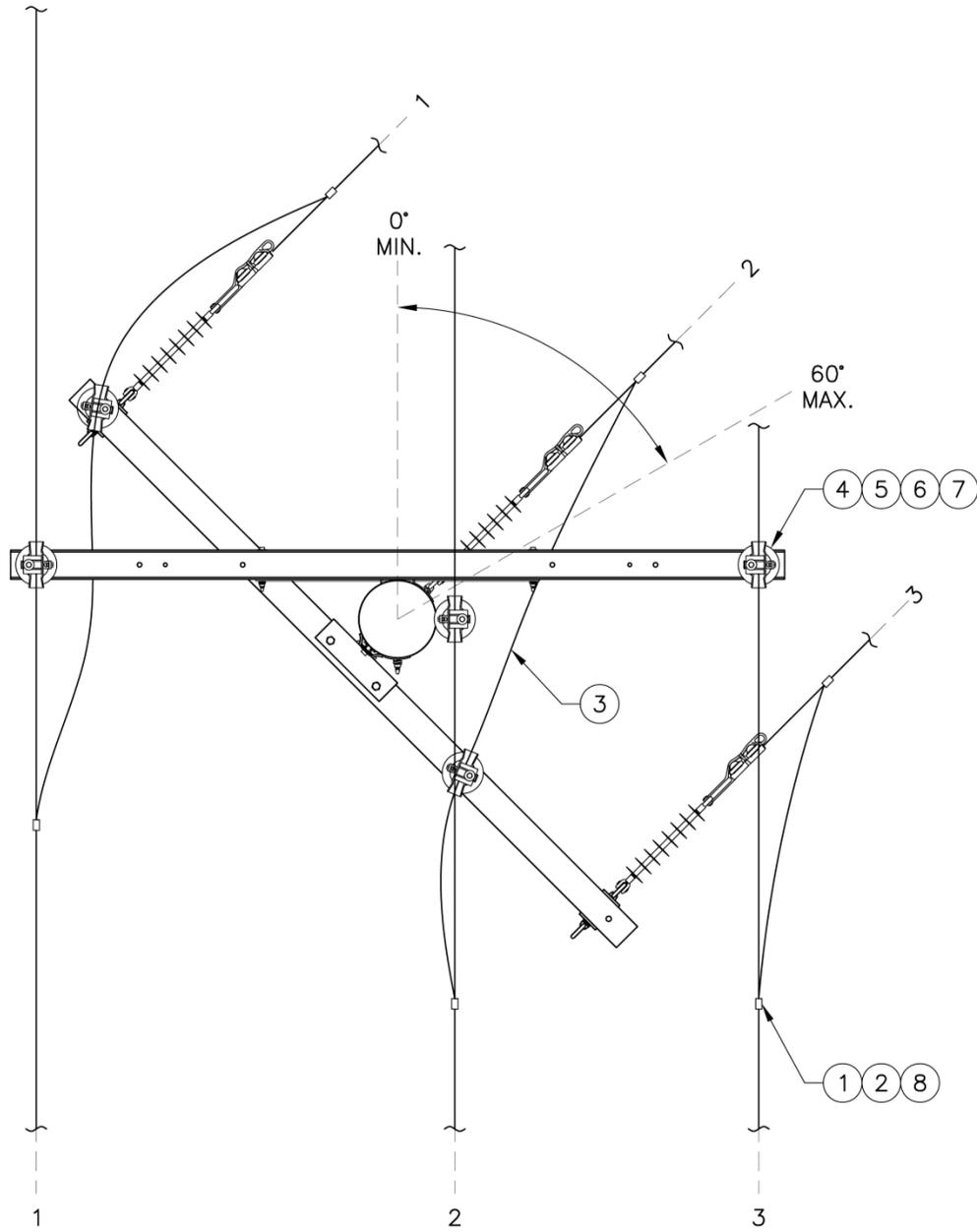


Figure 3n. Three-Phase Multi-Gain 0°-60° Tangent to Deadend 2 LPI Jumper, Side View

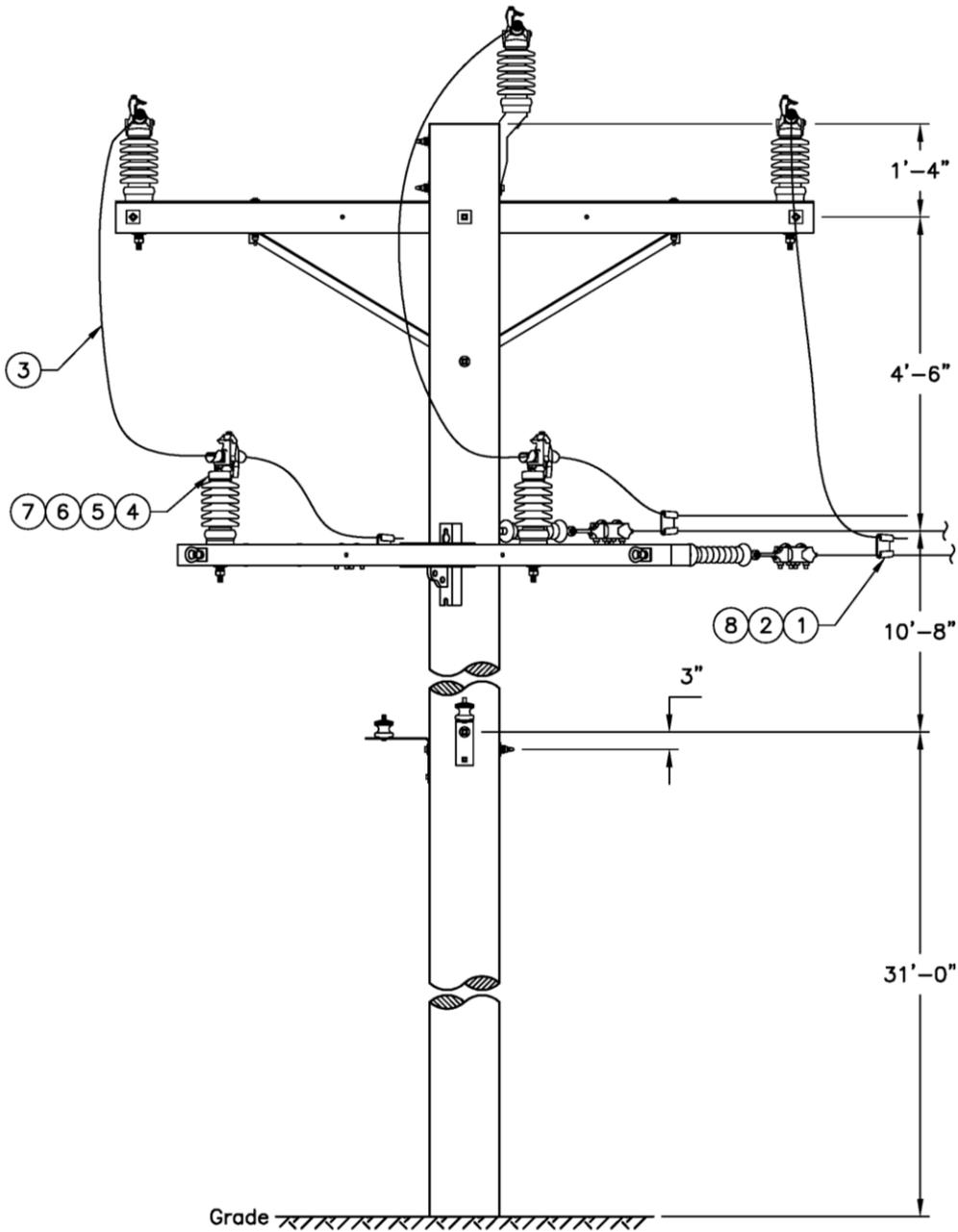


Figure 3o. Three-Phase Multi-Gain 60°-100° Tangent to Deadend 1 LPI Jumper, Normal, Top View

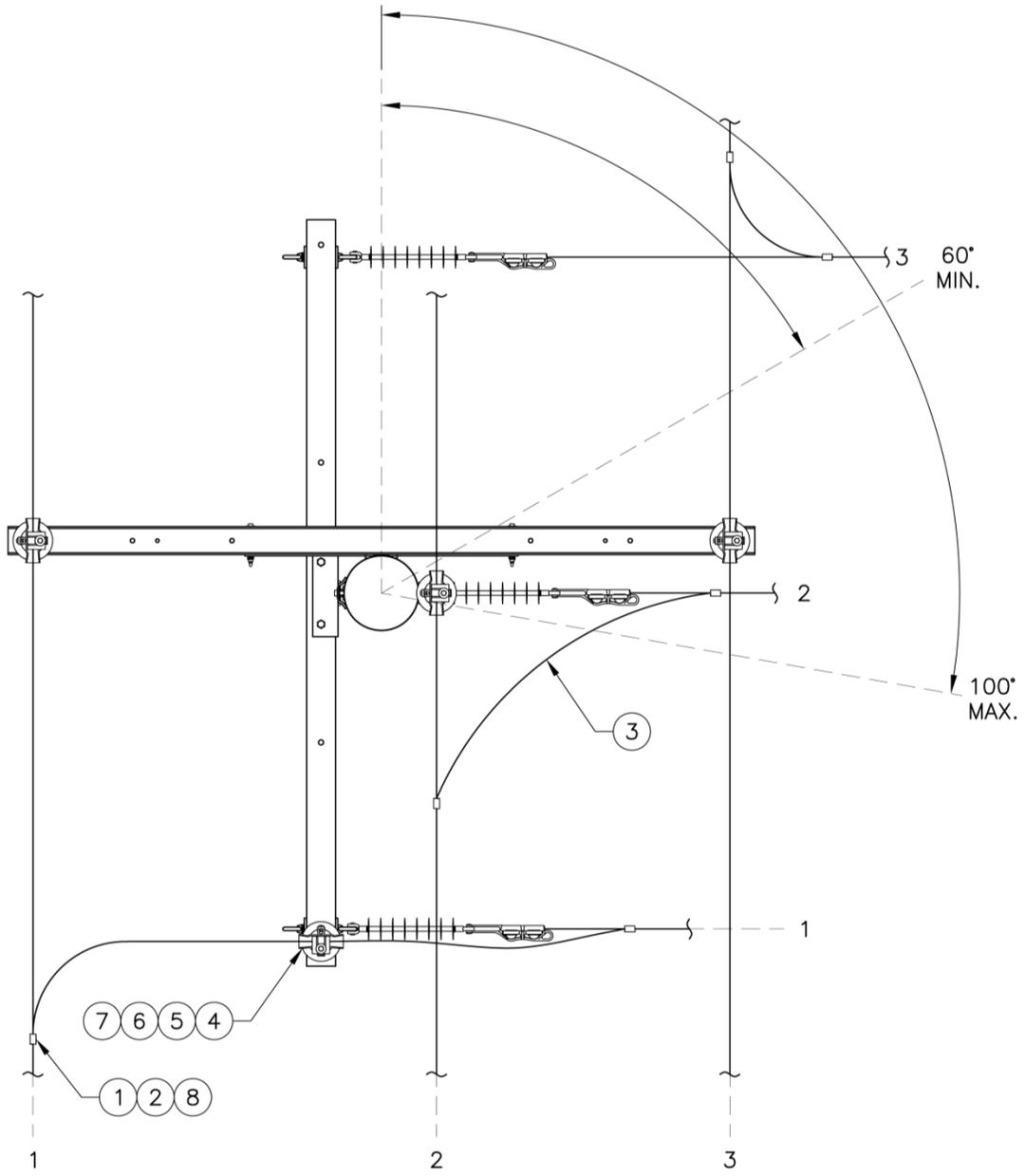


Figure 3p. Three-Phase Multi-Gain 60°-100° Tangent to Deadend 1 LPI Jumper, Normal, Side View

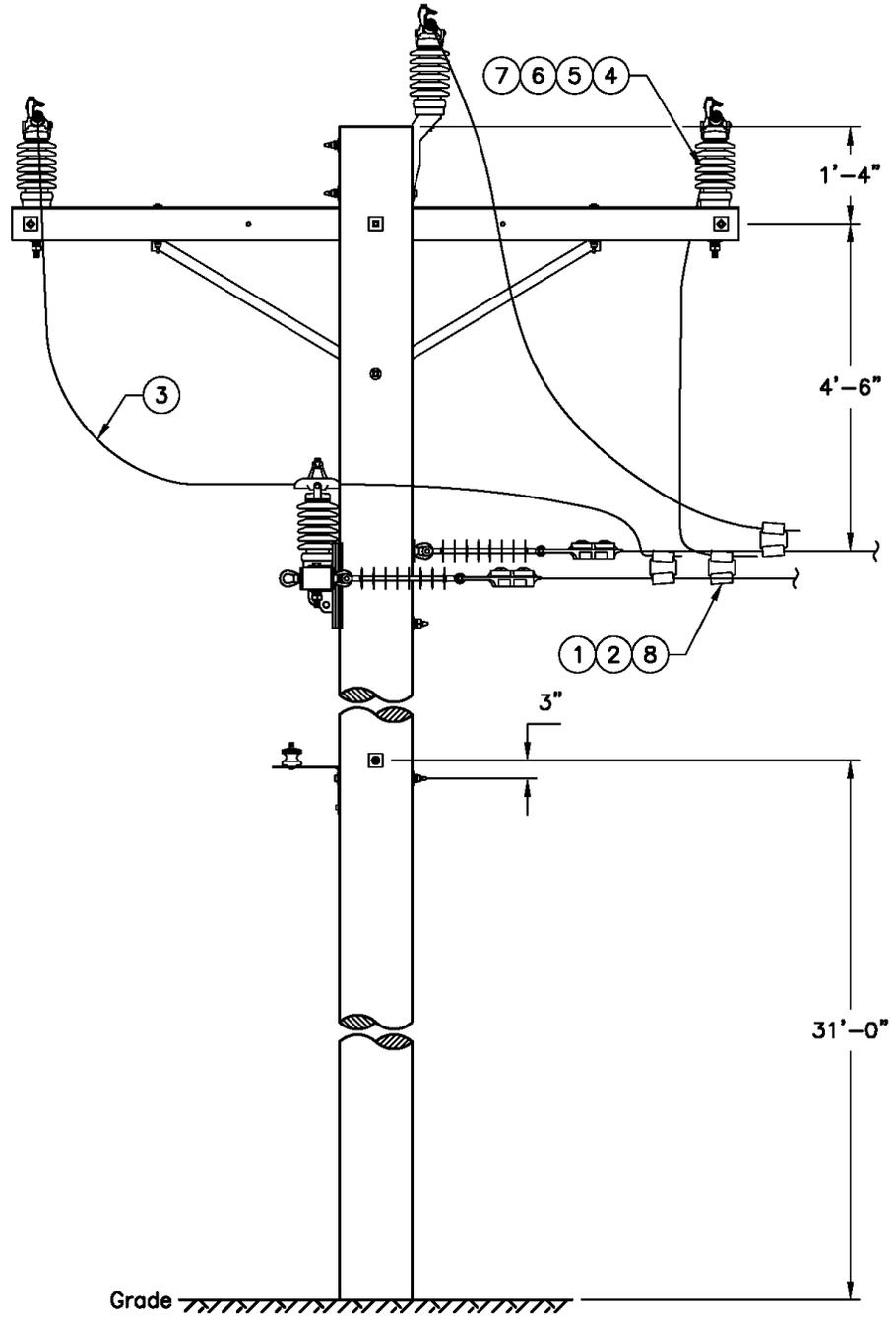


Figure 3q. Three-Phase Multi-Gain 60°-100° Tangent to Deadend 1 LPI Jumper, Alternate, Top View

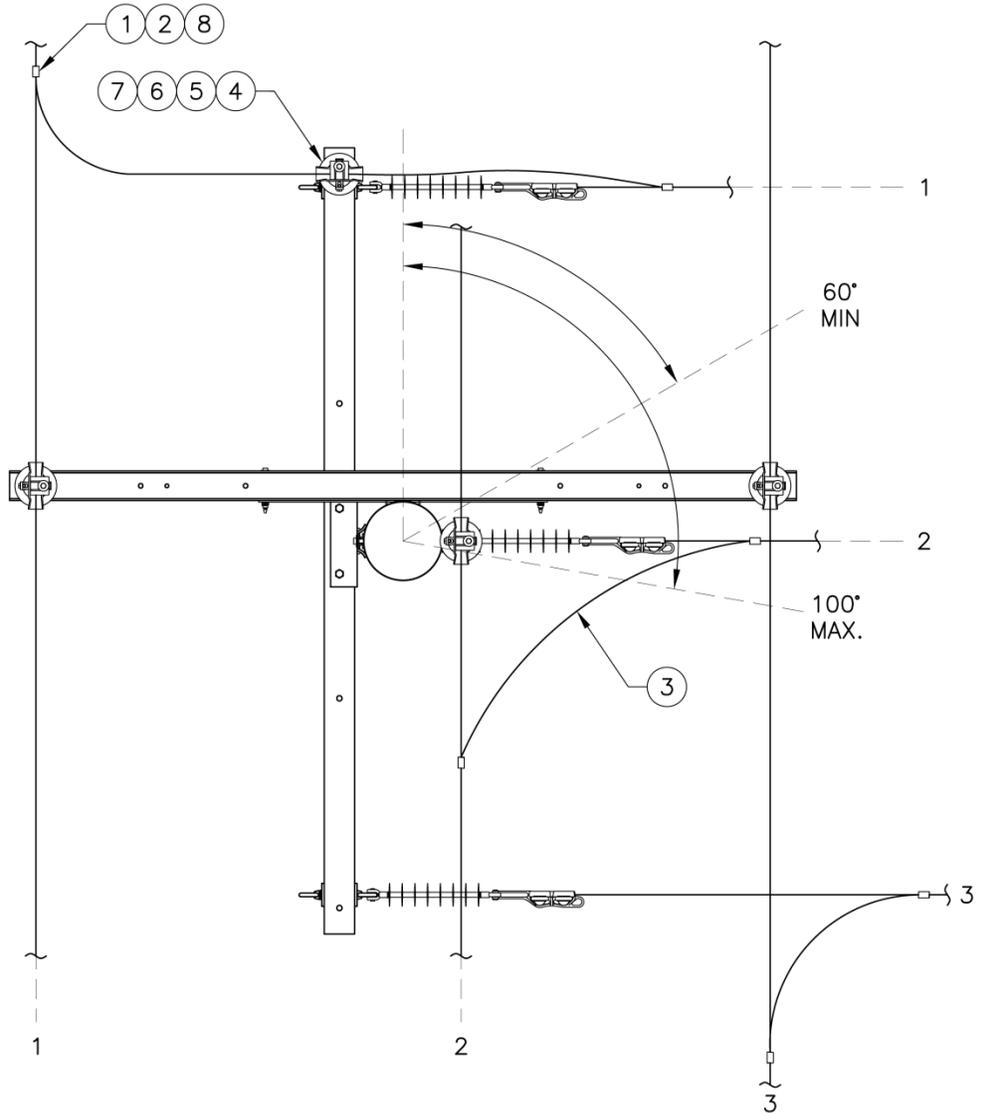


Figure 3r. Three-Phase Multi-Gain 60°-100° Tangent to Deadend 1 LPI Jumper, Alternate, Side View

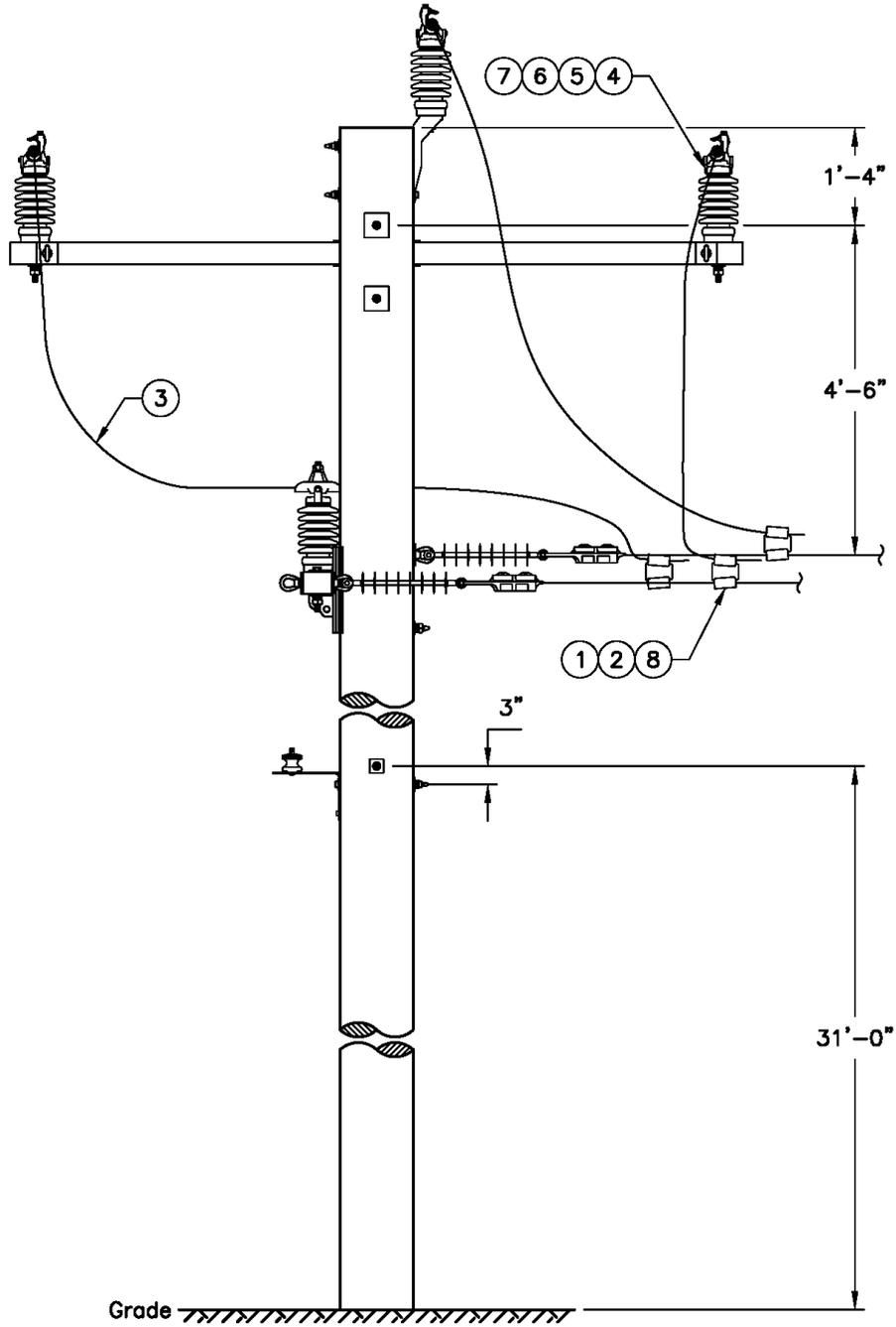


Figure 3s. Three Phase Multi-Gain 100°-180° Tangent to Deadend 2 LPI Jumper, Top View

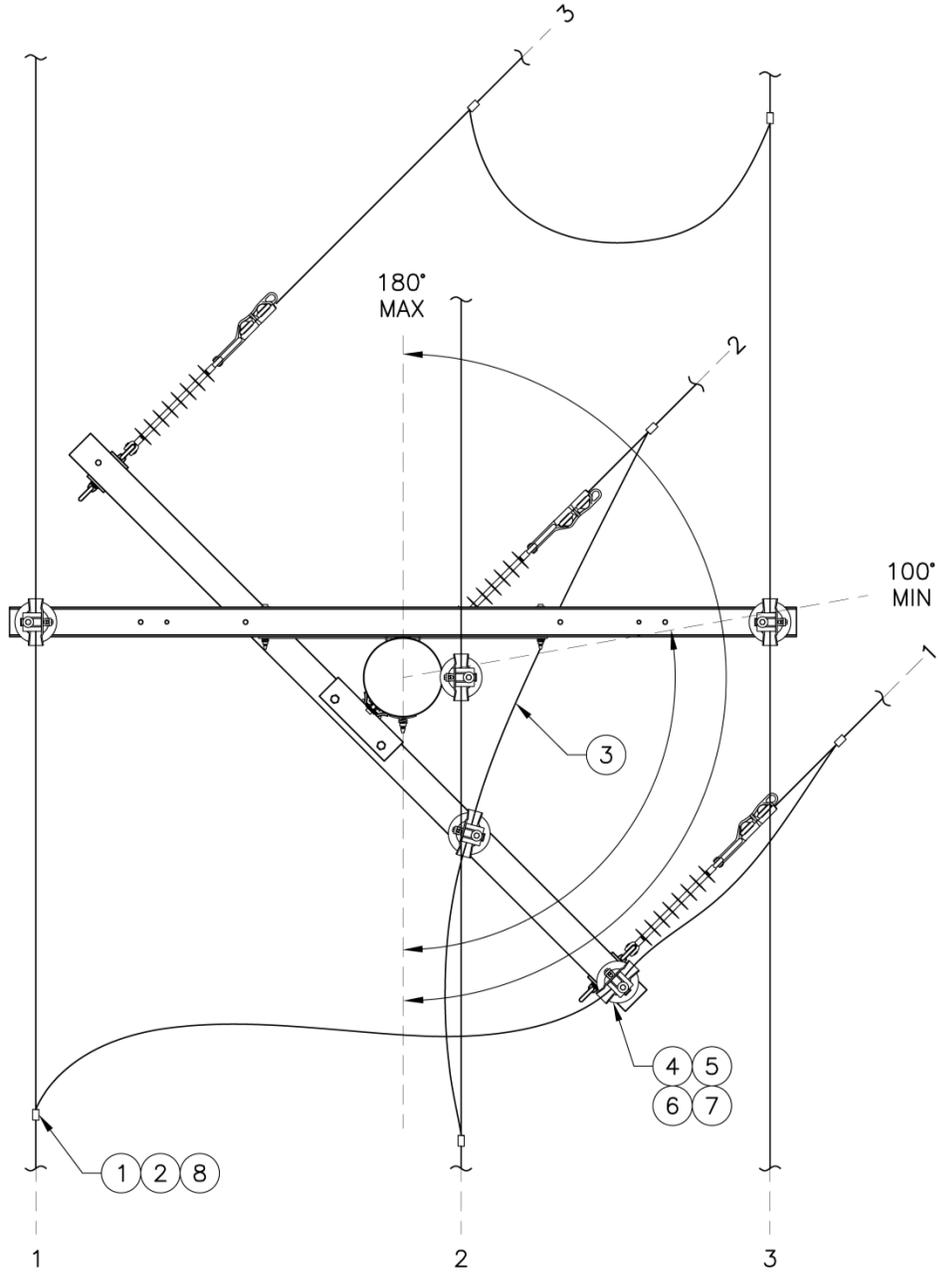


Figure 3t. Three-Phase Multi-Gain 100°-180° Tangent to Deadend 2 LPI Jumper, Side View

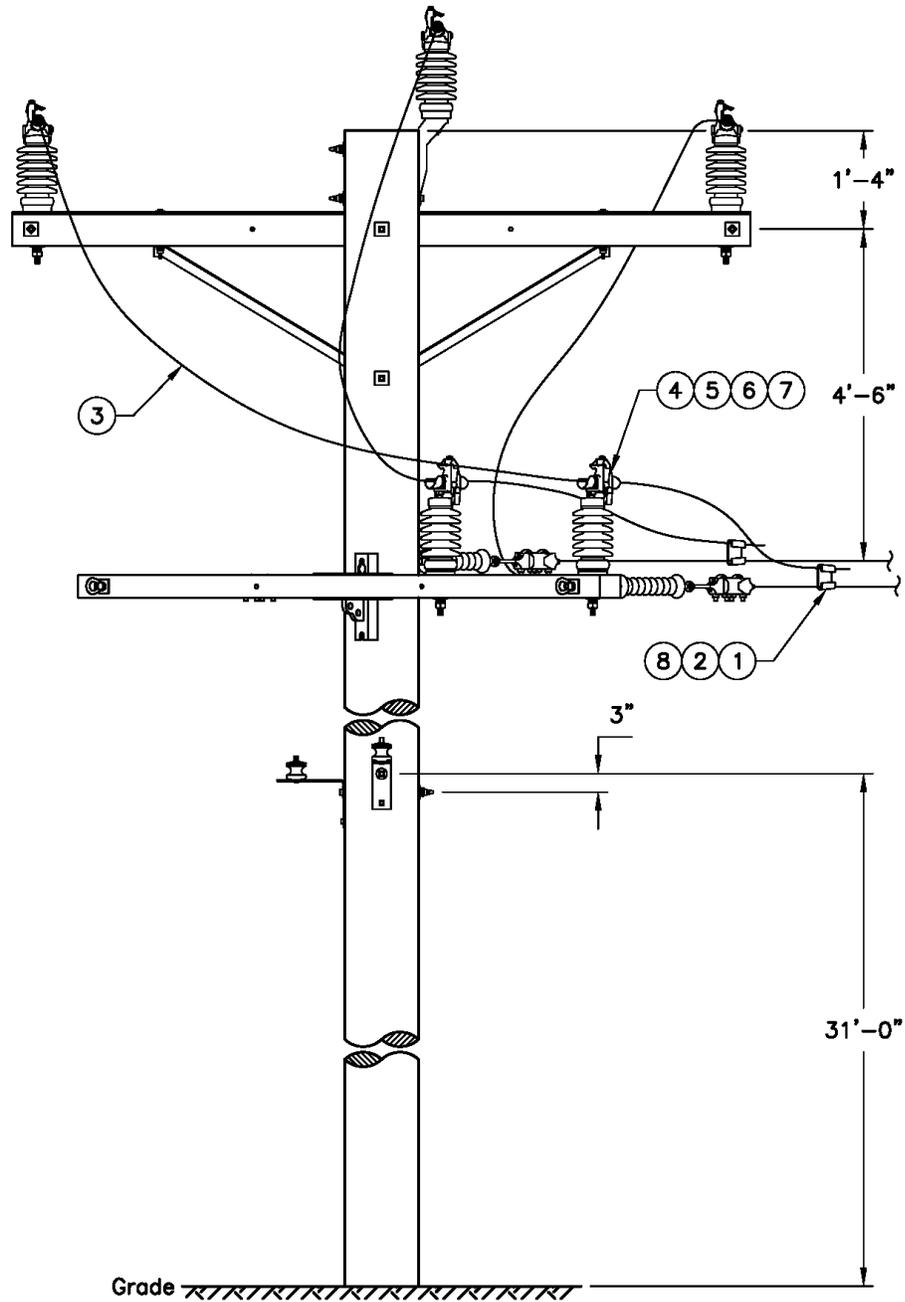


Figure 3u. Three-Phase Multi-Gain Tangent to Tangent No LPI Jumper, Normal, Top View

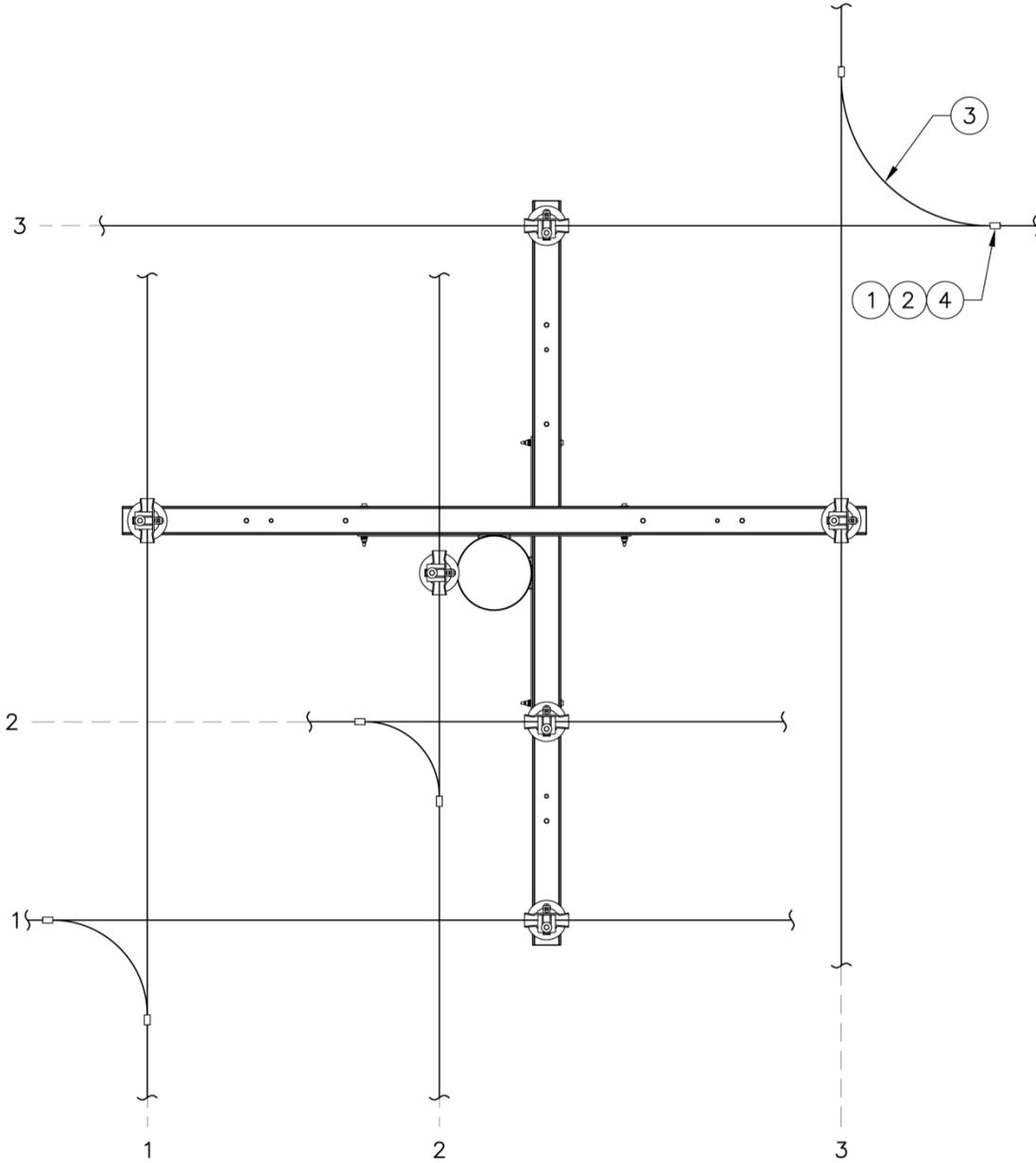


Figure 3v. Three-Phase Multi-Gain Tangent to Tangent No LPI Jumper, Alternate, Top View

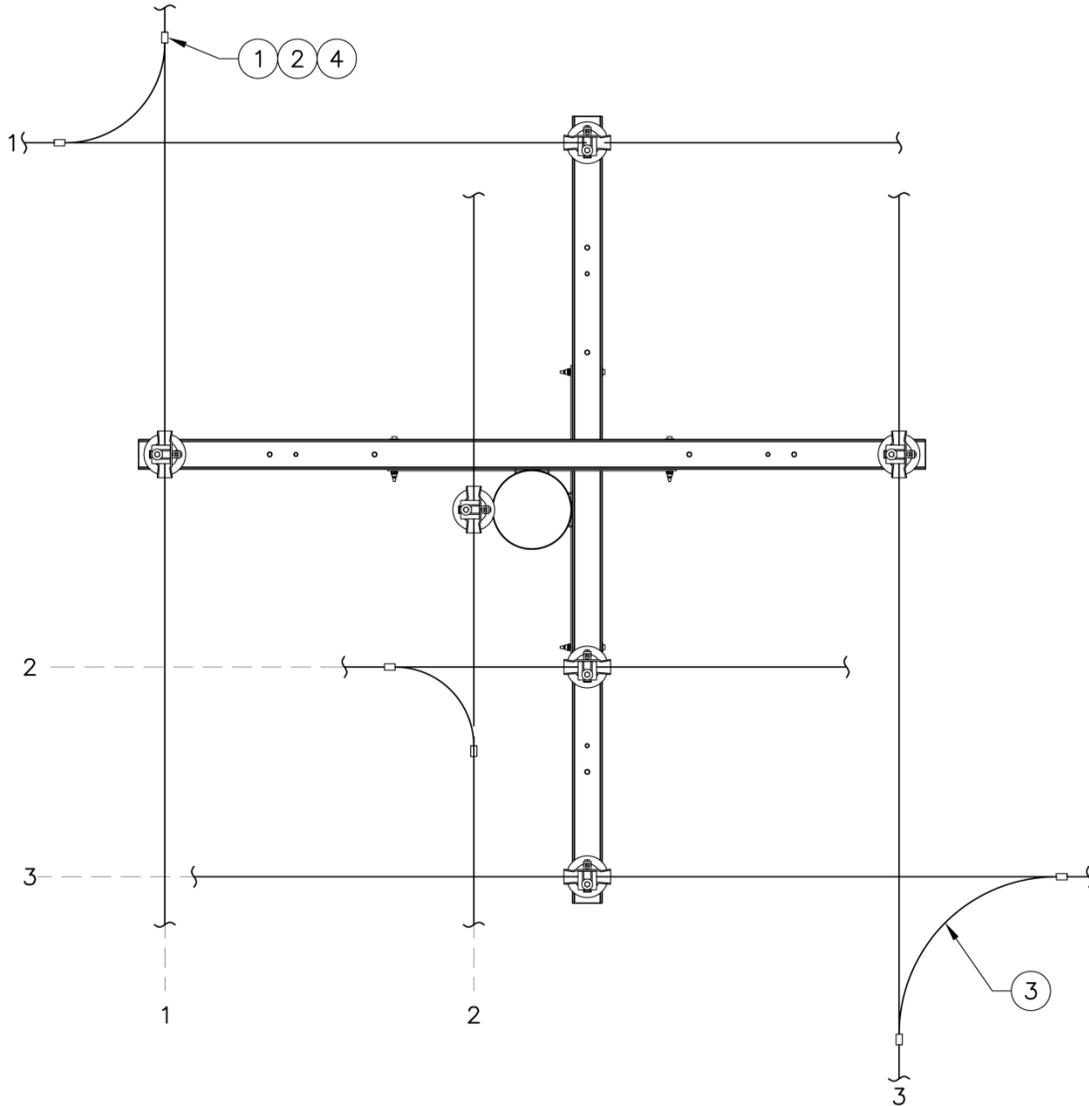
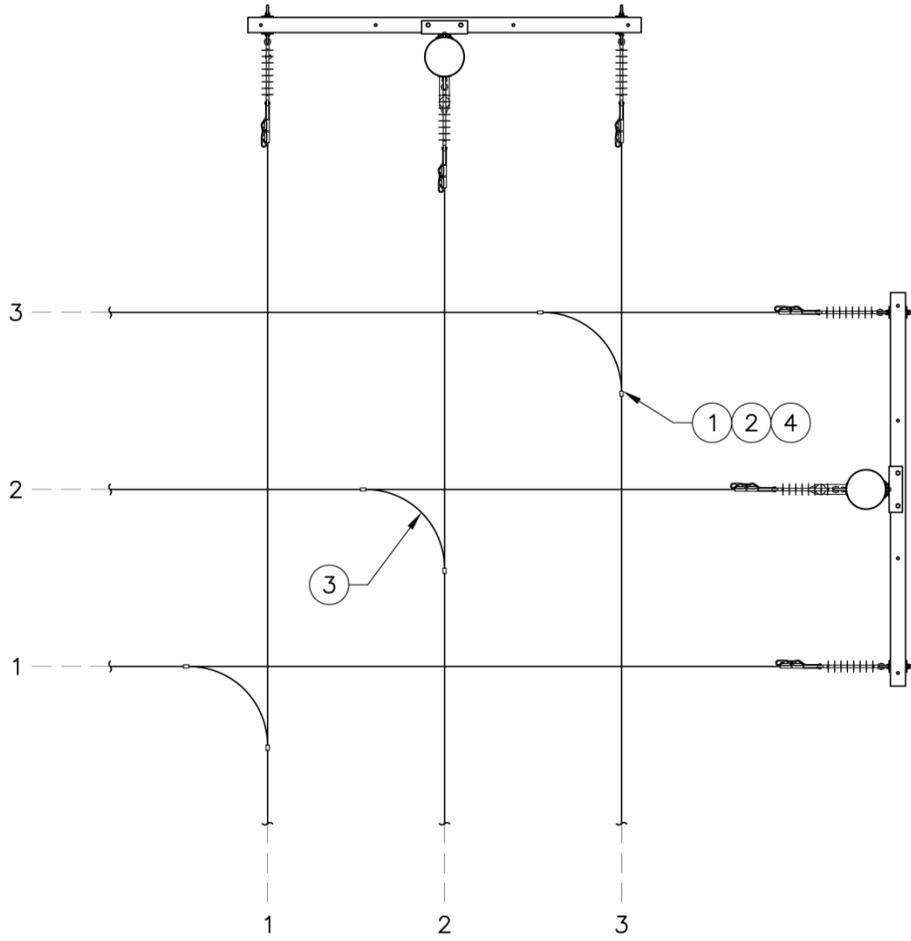


Figure 3w. Three-Phase Flying Tap No LPI Jumper, Top View



4. Construction Notes

Return any unused materials to the warehouse.

5. Material Lists

Table 5a. Materials for Three-Phase Jumpers with No LPIs

| Fig | Compatible Unit | ID | Quantity | | | | | | |
|----------------|---|-------------|----------|----|----|----|----|----|--|
| 3k, u, v, w | Unfused DE-DE 100°-150°, T-T, & flying tap 397-#4 | JMPR397-3#4 | | | | | | | |
| 3k, u, v, w | Unfused DE-DE 100°-150°, T-T, & flying tap 954-#4 | JMPR954-3#4 | | | | | | | |
| 3k, u, v, w | Unfused DE-DE 100°-150°, T-T, & flying tap #4-#4 | JMPR3#4-3#4 | | | | | | | |
| 3k, u, v, w | Unfused DE-DE 100°-150°, T-T, & flying tap 397-397 | JMPR397-397 | | | | | | | |
| 3k, u, v, w | Unfused DE-DE 100°-150°, T-T, & flying tap 954-397 | JMPR954-397 | | | | | | | |
| 3k, u, v, w | Unfused DE-DE 100°-150°, T-T, & flying tap 954-954 | JMPR954-954 | | | | | | | |
| # | Material Description | ID | | | | | | | |
| 1 | Clamp, hot line tap, #8 - 2/0 | 580725 | - | - | - | 6 | 6 | 6 | |
| 2 | Wedge connector, 397-397 | 013620 | - | 3 | 6 | - | - | - | |
| 2 | Wedge connector, 954-397 | 013619 | - | 3 | - | - | - | - | |
| 2 | Wedge connector, 954-954 | 013624 | 6 | - | - | - | - | - | |
| 3 | Wire, solid bare Cu, soft, #4 AWG (ft) | 610208 | - | - | - | 60 | 60 | 60 | |
| 3 | Wire, bare, AAC, 397.5 (ft) | 600113 | - | 60 | 60 | - | - | - | |
| 3 | Wire, bare, AAC, 954 (ft) | 600126 | 60 | - | - | - | - | - | |
| 4 | Stirrup, bolted 397.5-954 kcmil ACSR | 580678 | - | - | - | - | 3 | 3 | |
| 5 | Cartridge, Burndy, yellow shell | 013631 | 6 | 6 | 6 | - | - | - | |

Table 5b. Materials for Jumpers with 3 LPIs

| Fig | Compatible Unit | ID | Quantity | | | | | |
|-------------------------------|--|----------------|----------|----|----|----|----|----|
| 3a, c, e, m, g, i, o, q, s | Unfused DE-DE 0°-100° 397-#4 | JMPR397-3#4LPI | ----- | | | | | |
| 3a, c, e, m, g, i, o, q, s | Unfused DE-DE 0°-100° 954-#4 | JMPR954-3#4LPI | ----- | | | | | |
| 3a, c, e, m, g, i, o, q, s | Unfused DE-DE 0°-100° #4-#4 | JMPR3#4-3#4LPI | ----- | | | | | |
| 3a, c, e, m, g, i, o, q, s | Unfused DE-DE 0°-100° 397-397 | JMPR397-397LPI | ----- | | | | | |
| 3a, c, e, m, g, i, o, q, s | Unfused DE-DE 0°-100° 954-397 | JMPR954-397LPI | ----- | | | | | |
| 3a, c, e, m, g, i, o, q, s | Unfused DE-DE 0°-100° 954-954 | JMPR954-954LPI | ----- | | | | | |
| | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| # | Material Description | ID | | | | | | |
| 1 | Clamp, hot line tap - #8 - 2/0 | 580725 | - | - | - | 6 | 6 | 6 |
| 2 | Connector, Ampact - 397-397 | 013620 | - | 3 | 6 | - | - | - |
| 2 | Connector, Ampact - 954-397 | 013619 | - | 3 | - | - | - | - |
| 2 | Connector, Ampact - 954-954 | 013624 | 6 | - | - | - | - | - |
| 3 | Wire, solid bare Cu, soft, #4 AWG (ft) | 610208 | - | - | - | 60 | 60 | 60 |
| 3 | Wire, bare, AAC, 397.5 (ft) | 600113 | - | 60 | 60 | - | - | - |
| 3 | Wire, bare, AAC, 954 (ft) | 600126 | 60 | - | - | - | - | - |
| 4 | Insulator, post top, 34.5 kV (tie-top) | 014304 | - | - | - | 3 | 3 | 3 |
| 4 | Insulator, post top, 34.5 kV (clamp-top) | 690159 | 3 | 3 | 3 | - | - | - |
| 5 | Stud, long - 3/4" x 7-1/2" | 696828 | 3 | 3 | 3 | 3 | 3 | 3 |
| 6 | Wire, #6 Cu solid, bare, SD, (ft) | 610210 | - | - | - | 3 | 3 | 3 |
| 7 | Clamp, trunnion, line post, 0.5"-1.06" | 695193 | - | 3 | 3 | - | - | - |
| 7 | Clamp, trunnion, line post, .99"-1.5" | 695196 | 3 | - | - | - | - | - |
| 8 | Stirrup, bolted 397.5-954 kcmil ACSR | 580678 | - | - | - | - | 3 | 3 |
| 9 | Cartridge, Burndy, yellow shell | 013631 | 6 | 6 | 6 | - | - | - |

6. References

SCL Construction Standard 0100.25; “Fused Overhead Jumpers”

7. Sources

Hall, Alan; SCL Senior Electrical Engineer and subject matter expert for 0100.23
(alan.hall@seattle.gov)

Lu, Curtis; SCL Standards Engineer and originator of 0100.23 (curtis.lu@seattle.gov)

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

SCL Construction Standard D9-67.1 (canceled); “15/26 kV Distribution Corner Pole Details 3 Phase Both Ways”