

## Overhead Primary Switch Installation

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### 1. Scope

This standard covers the information necessary to install manual overhead primary switches on wood poles in the Seattle City Light (SCL) 26 kV primary distribution system. Requirements for vertical spacing and hardware, and installation instructions to connect the termination assembly to the pole are included.

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

Refer to SCL 0125.07 for the installation of Scada-Mate primary switches.

Refer to SCL 0126.01 for the installation of primary pole terminations.

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### 2. Application

This standard provides direction to SCL engineers, crews, and contractors for the installation of manual overhead primary switches on 26 kV distribution poles.

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### 3. Requirements

Overhead primary switches that SCL installs come in 600 A and 1200 A ratings and in both horizontal and vertical orientations. Horizontal switches are used for sectionalizing feeders. Vertical switches are used on terminal poles. Poles with switches shall be a minimum length of 55 feet. Refer to SCL 4501.50 for switch specifications.

The horizontal 600 A and 1200 A manually operated overhead primary switch shall be constructed as shown in figures 3a, 3b and 3c.

The vertical 600 A and 1200 A manually operated overhead primary switch shall be constructed as shown in figures 3d and 3e.

All overhead switches shall be installed with the top bolt hole of the switch bracket located 6 ft below the top of the pole.

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Standard Coordinator  
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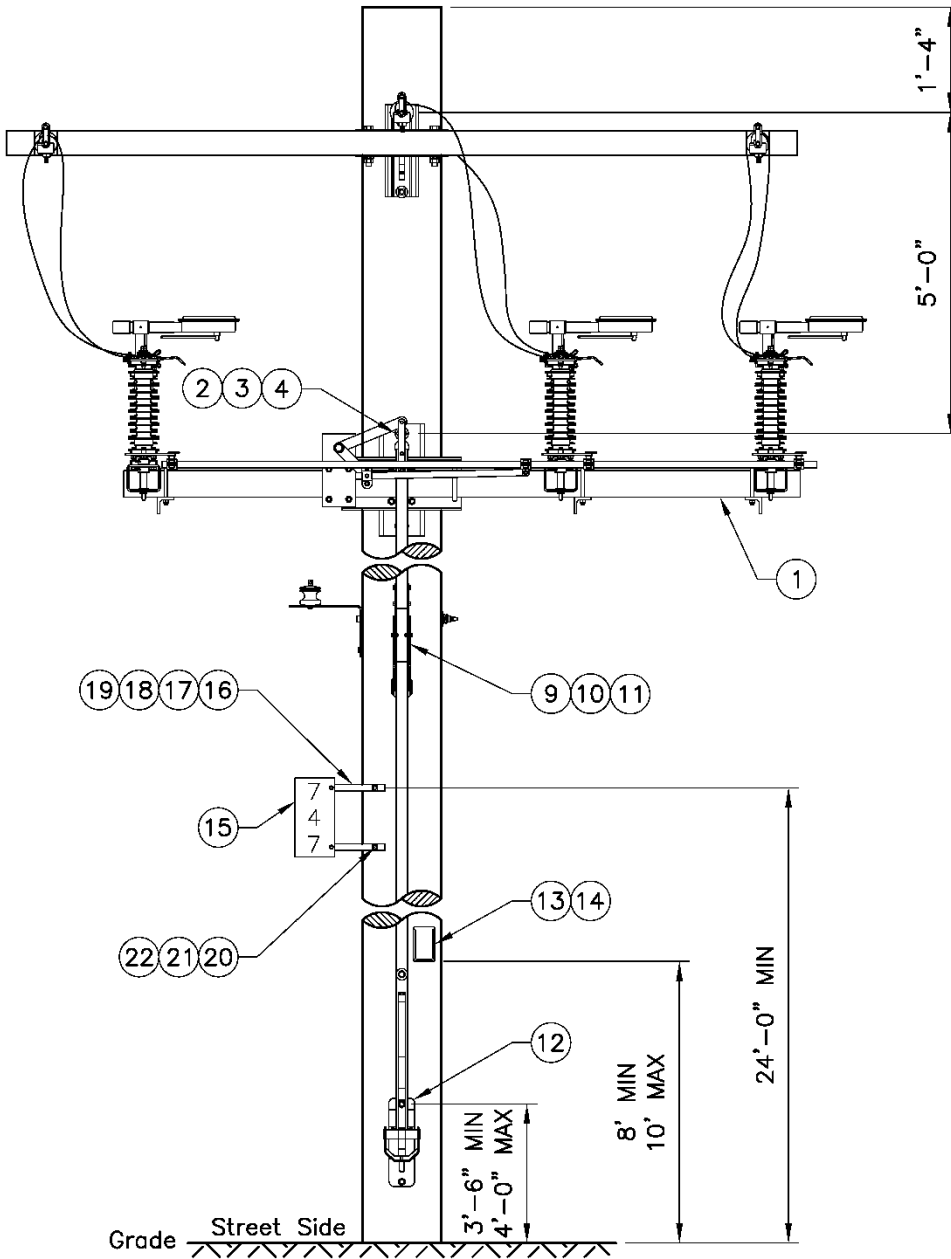
Standards Engineering Supervisor  
Brett Hanson



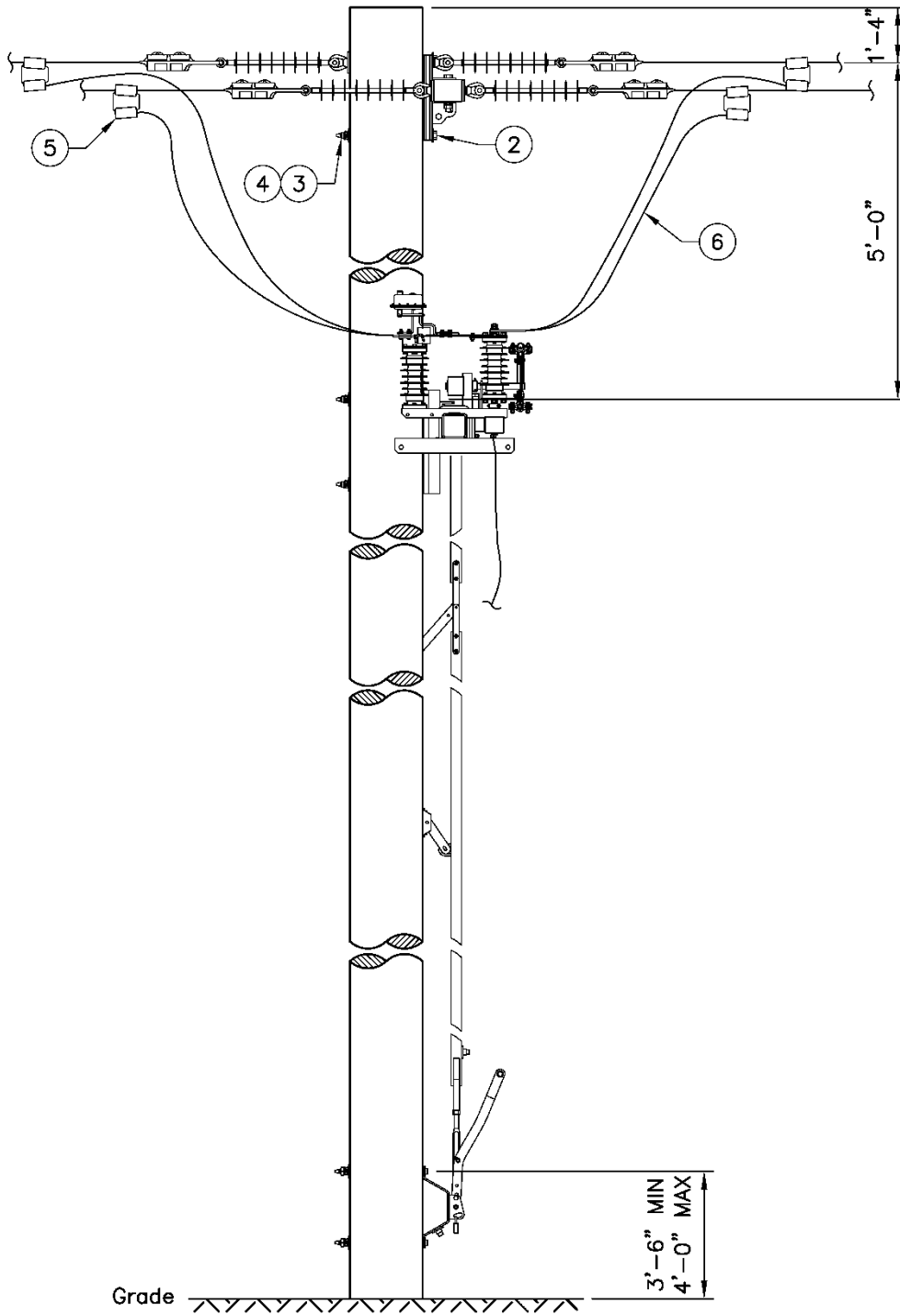
Division Director  
Bob Risch



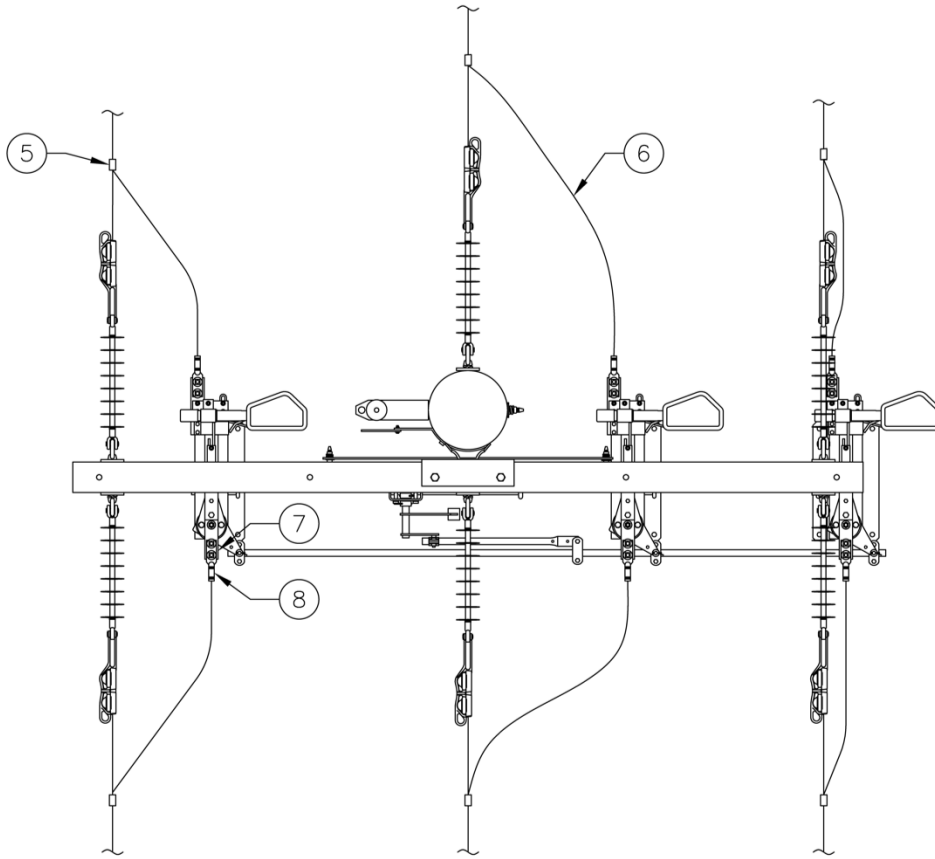
**Figure 3a. Three-Phase Horizontal Switch Assembly (Front View)**



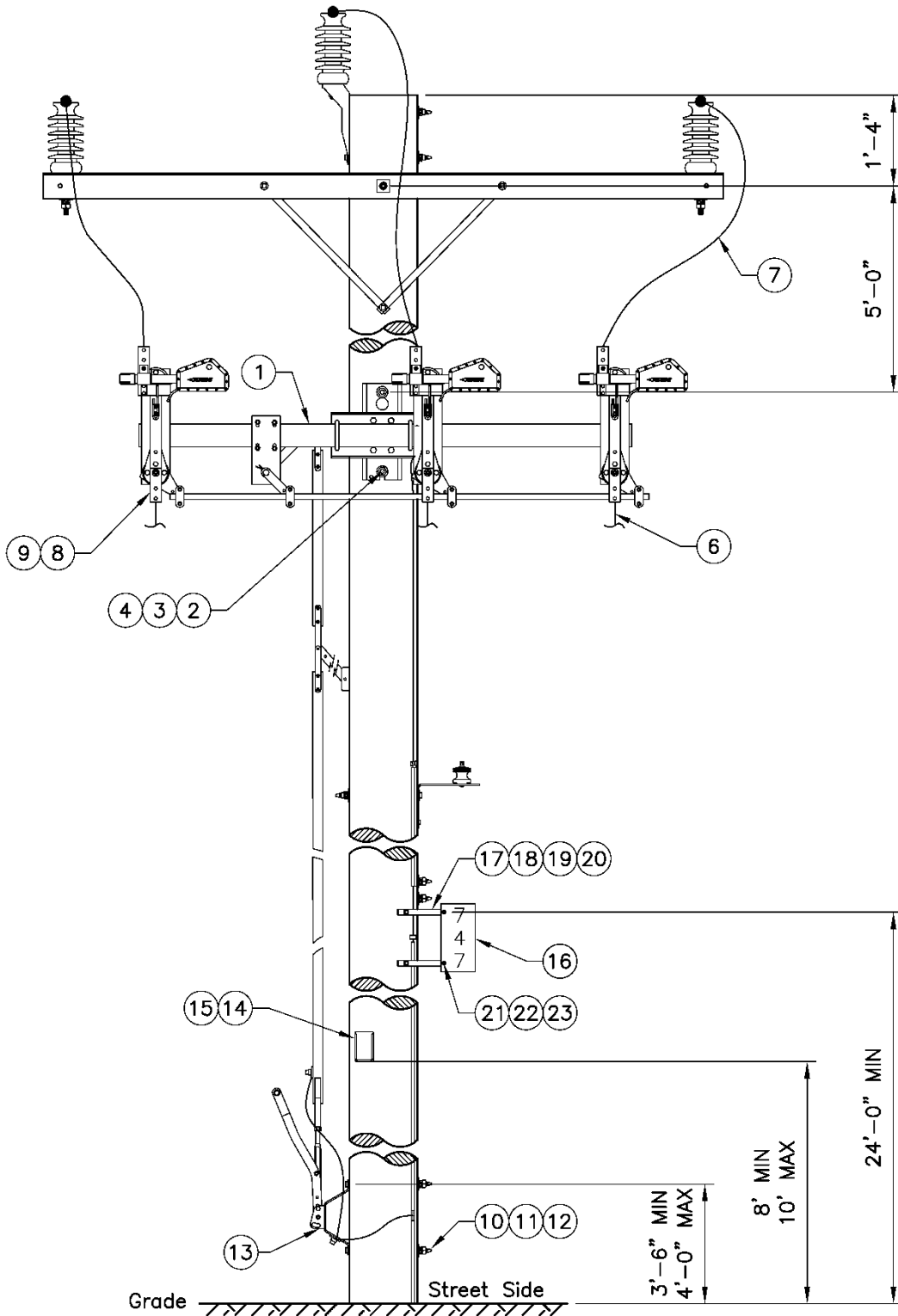
**Figure 3b. Three-Phase Horizontal Switch Assembly (Side View)**



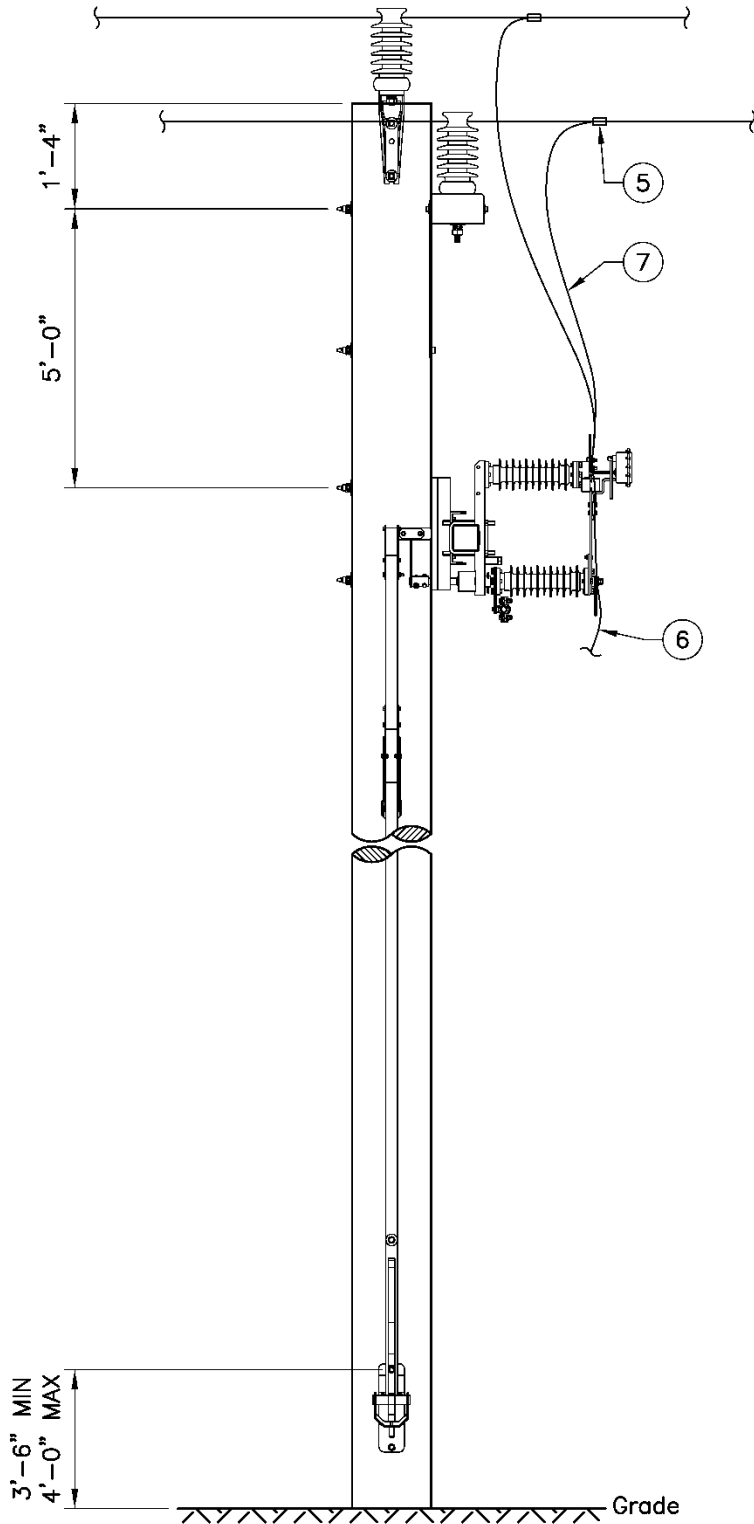
**Figure 3c. Three-Phase Horizontal Switch Assembly (Top View)**



**Figure 3d. Three-Phase Vertical Switch Assembly (Front View)**



**Figure 3e. Three-Phase Vertical Switch Assembly (Side View)**



### 3.1 Switch Handle

For a horizontal switch, the handle shall be installed with the top bolt hole located between 42–48 inches above ground level on the face side of the pole.

For a vertical switch, the handle shall be installed with the top bolt hole located between 42–48 inches above ground level on the sidewalk side of the pole.

### 3.2 Operator Tag Holder

The operator tag holder shall be installed on the pole face at a minimum height of 8 ft and a maximum height of 10 ft.

### 3.3 Switch Number Board

The switch number board shall be installed on the street side at a minimum of 24 ft above street level.

### 3.4 Grounding

The switch handle shall be bonded to the pole ground and switch riser as shown in Figure 3.4.

**Figure 3.4 Switch Handle Grounding**



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## 4. Construction Notes

### 4.1 Poles

If a pole on which a switch is to be installed is located in poor soil, a taller pole must be used.

Switches should not be installed on poles located in areas with no truck access.

## 4.2 Switch Handle

If the handle cannot be installed on the required side of the pole, it can be installed in the following locations:

- **On the street side of the pole, less than 3 ft from the street:** The switch handle, when in the down position, shall be installed at a minimum of 15 ft above the ground line.
- **On the street side of the pole, 3 ft or more from the street:** The switch handle shall be installed at 3 ft-6 in above the ground line.
- **On the sidewalk side of the pole, 2 ft or less from the sidewalk:** The switch handle, when in the down position, shall be installed at a minimum of 10 ft above the ground line
- **On the sidewalk side of the pole, more than 2 ft from sidewalk:** The switch handle shall be installed at 3 ft-6 in above the ground line.

## 4.3 Wedge Taps

Two sets of wedge taps are provided with 1/0, 350, and 500 kcmil, underground conductor, 600 A terminal poles to accommodate either 397.5 kcmil or 954 kcmil conductors. Use the appropriate taps and return the others to the warehouse.



**5. Material Lists**

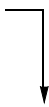
**Table 5a. Materials for Three-Phase 600 A Horizontal Switch**

| Fig      | Compatible Unit                                    | ID            | Quantity |    |
|----------|--|---------------|----------|----|
| 3a, b, c | 600 A three-phase horizontal switch, 397-397 kcmil | SWOH-H600-397 |          |    |
| 3a, b, c | 600 A three-phase horizontal switch, 954-397 kcmil | SWOH-H600-954 |          |    |
| #        | Material Description                               | ID            |          |    |
| 1        | Switch, 600 A, horizontal                          | 250150        | 1        | 1  |
| 2        | Bolt, 3/4" x 16"                                   | 780877        | 2        | 2  |
| 3        | Washer, curved, 4" x 4"                            | 584775        | 2        | 2  |
| 4        | Washer, double coil lock, 3/4"                     | 584267        | 2        | 2  |
| 5        | Wedge taps, 954 kcmil:954 kcmil                    | 013624        | 3        | –  |
| 5        | Wedge taps, 397.5 kcmil :397.5 kcmil               | 013620        | 3        | 6  |
| 6        | Jumper wire, 397.5 kcmil AAC                       | 600113        | 30       | 60 |
| 6        | Jumper wire, 954 kcmil AAC                         | 600126        | 30       | –  |
| 7        | Washer bolt assembly, 2-1/2"                       | 782041        | 12       | 12 |
| 8        | Connector, compression terminal, 500 kcmil Al      | 651270        | 3        | 6  |
| 8        | Connector, compression terminal, 1000 kcmil Al     | 651295        | 3        | –  |
| 9        | Bolt, 5/8" x 16"                                   | 780847        | 2        | 2  |
| 10       | Washer, curved, 2-1/2" x 2-1/2"                    | 585135        | 2        | 2  |
| 11       | Washer, double coil lock, 5/8"                     | 584261        | 2        | 2  |
| 12       | Padlock, SNM-1                                     | N/A           | 1        | 1  |
| 13       | Tag holder   | 581799        | 1        | 1  |
| 14       | Nail, large head                                   | 782416        | 2        | 2  |
| 15       | Number board                                       | N/A           | 1        | 1  |
| 16       | Flat washer, 1/4" bronze                           | 788022        | 2        | 2  |
| 17       | Hex nut, 1/4" bronze                               | 783321        | 2        | 2  |
| 18       | Cap screw, 1/4" x 1", bronze                       | 784505        | 2        | 2  |
| 19       | Lock washer, 1/4" bronze                           | 788121        | 2        | 2  |
| 20       | Lag screw, 1/4" x 4"                               | 785261        | 2        | 2  |
| 21       | Flat washer, 3/8" x 1" galvanized                  | 585020        | 2        | 2  |
| 22       | Bracket, number board mounting                     | 563225        | 2        | 2  |
| 23       | Cartridge, Burndy, yellow shell                    | 013631        | 6        | 6  |

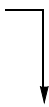
**Table 5b. Materials for Three-Phase 600 A Vertical Switch**

| Fig   | Compatible Unit                                | ID             | Quantity |    |    |    |    |
|-------|--|----------------|----------|----|----|----|----|
| 3d, e | 600 A three-phase vertical switch, 1000 kcmil  | SWOH-V600-1000 |          |    |    |    |    |
| 3d, e | 600 A three-phase vertical switch, 750 kcmil   | SWOH-V600-750  |          |    |    |    |    |
| 3d, e | 600 A three-phase vertical switch, 500 kcmil   | SWOH-V600-500  |          |    |    |    |    |
| 3d, e | 600 A three-phase vertical switch, 350 kcmil   | SWOH-V600-350  |          |    |    |    |    |
| 3d, e | 600 A three-phase vertical switch, 1/0 AWG     | SWOH-V600-1/0  |          |    |    |    |    |
| #     | Material Description                           | ID             |          |    |    |    |    |
| 1     | Switch, 600 A riser                            | 250151         | 1        | 1  | 1  | 1  | 1  |
| 2     | Bolt, 3/4" x 16"                               | 780877         | 2        | 2  | 2  | 2  | 2  |
| 3     | Washer, curved, 4" x 4"                        | 584775         | 2        | 2  | 2  | 2  | 2  |
| 4     | Washer, double coil lock, 3/4"                 | 584267         | 2        | 2  | 2  | 2  | 2  |
| 5     | Wedge taps, 954:954                            | 013624         | -        | -  | -  | 3  | 3  |
| 5     | Wedge taps, 954:397.5                          | 013619         | 3        | 3  | 3  | -  | -  |
| 5     | Wedge taps, 397.5:397.5                        | 013620         | 3        | 3  | 3  | -  | -  |
| 6     | Wire, #4 AWG, bare, Cu, solid, HD              | 610008         | 30       | -  | -  | -  | -  |
| 6     | Wire, 500 kcmil, bare, Cu                      | 610397         | -        | 30 | 30 | 30 | 30 |
| 7     | Jumper wire, 397.5 AAC                         | 600113         | 30       | 30 | 30 | -  | -  |
| 7     | Jumper Wire, 954 AAC                           | 600126         | -        | -  | -  | 30 | 30 |
| 8     | Washer bolt assembly, 2-1/2"                   | 782041         | 12       | 12 | 12 | 12 | 12 |
| 9     | Connector, compression terminal, 250 kcmil Cu  | 677083         | 3        | -  | -  | -  | -  |
| 9     | Connector, compression terminal, 500 kcmil Cu  | 677091         | -        | 3  | 3  | 3  | 3  |
| 9     | Connector compression terminal, 500 kcmil Al   | 651270         | 3        | 3  | 3  | -  | -  |
| 9     | Connector, compression terminal, 1000 kcmil Al | 651295         | -        | -  | -  | 3  | 3  |
| 10    | Bolt, 5/8" x 16"                               | 780847         | 2        | 2  | 2  | 2  | 2  |
| 11    | Washer, curved, 2-1/2" x 2-1/2"                | 585135         | 2        | 2  | 2  | 2  | 2  |
| 12    | Washer, double coil lock, 5/8"                 | 584261         | 2        | 2  | 2  | 2  | 2  |
| 13    | Padlock, SNM-1                                 | N/A            | 1        | 1  | 1  | 1  | 1  |
| 14    | Tag holder                                     | 581799         | 1        | 1  | 1  | 1  | 1  |
| 15    | Nail, large head                               | 782416         | 2        | 2  | 2  | 2  | 2  |
| 16    | Number board                                   | N/A            | 1        | 1  | 1  | 1  | 1  |
| 17    | Flat washer, 1/4" bronze                       | 788022         | 2        | 2  | 2  | 2  | 2  |
| 18    | Hex nut, 1/4" bronze                           | 783321         | 2        | 2  | 2  | 2  | 2  |
| 19    | Cap screw, 1/4" x 1", bronze                   | 784505         | 2        | 2  | 2  | 2  | 2  |
| 20    | Lock washer, 1/4" bronze                       | 788121         | 2        | 2  | 2  | 2  | 2  |
| 21    | Lag screw, 1/4" x 4"                           | 785261         | 2        | 2  | 2  | 2  | 2  |
| 22    | Flat washer, 3/8" x 1", galvanized             | 585020         | 2        | 2  | 2  | 2  | 2  |
| 23    | Bracket, number board mounting                 | 563225         | 2        | 2  | 2  | 2  | 2  |
| 24    | Cartridge, Burndy, yellow shell                | 013631         | 6        | 6  | 6  | 3  | 3  |

**Table 5c. Materials for Three-Phase 1200 A Horizontal Switch**

| Fig      | Compatible Unit                             | ID             | Qty  |
|----------|---|----------------|--|
| 3a, b, c | 1200A three-phase horizontal switch         | SWOH-H1200-954 |  |
| #        | Material Description                        | ID             |  |
| 1        | Switch, 1200 A, horizontal                  | 250152         | 1  |
| 2        | Bolt, 3/4" x 16"                            | 780877         | 2  |
| 3        | Washer, curved, 4" x 4"                     | 584775         | 2  |
| 4        | Washer, double coil lock, 3/4"              | 584267         | 2  |
| 5        | Wedge taps, 954 kcmil:954 kcmil             | 013624         | 6  |
| 6        | Jumper wire, 954 AAC                        | 600126         | 60   |
| 7        | Washer bolt assembly, 2-1/2"                | 782041         | 12   |
| 8        | Connector, compression terminal, 1000 kcmil | 651296         | 6  |
| 9        | Bolt, 5/8" x 16"                            | 780847         | 2  |
| 10       | Washer, curved, 2-1/2" x 2-1/2"             | 585135         | 2  |
| 11       | Washer, double coil lock, 5/8"              | 584261         | 2  |
| 12       | Padlock, SNM-1                              | N/A            | 1  |
| 13       | Tag holder                                  | 581799         | 1  |
| 14       | Nail, large head                            | 782416         | 2  |
| 15       | Number board                                | N/A            | 1  |
| 16       | Flat washer, 1/4" bronze                    | 788022         | 2  |
| 17       | Hex nut, 1/4" bronze                        | 783321         | 2  |
| 18       | Cap screw, 1/4" x 1", bronze                | 784505         | 2  |
| 19       | Lock washer, 1/4" bronze                    | 788121         | 2  |
| 20       | Lag screw, 1/4" x 4"                        | 785261         | 2  |
| 21       | Flat washer, 3/8" x 1" galvanized           | 585020         | 2  |
| 22       | Bracket, number board mounting              | 563225         | 2  |
| 23       | Cartridge, Burndy, yellow shell             | 013631         | 6  |

**Table 5d. Materials for Three-Phase 1200 A Vertical Switch**

| Fig   | Compatible Unit                                | ID              | Qty  |
|-------|--|-----------------|--|
| 3d, e | 1200 A three-phase vertical switch             | SWOH-V1200-1000 |  |
| #     | Material Description                           | ID              |  |
| 1     | Switch, 1200 A riser                           | 250153          | 1  |
| 2     | Bolt, 3/4" x 16"                               | 780877          | 2  |
| 3     | Washer, curved, 4" x 4"                        | 584775          | 2  |
| 4     | Washer, double coil lock, 3/4"                 | 584267          | 2  |
| 5     | Wedge taps, 954 kcmil:954 kcmil                | 013624          | 3  |
| 6     | Wire, 500 kcmil, bare, Cu                      | 610397          | 60   |
| 7     | Jumper wire, 954 AAC                           | 600126          | 30   |
| 8     | Washer bolt assembly, 2-1/2"                   | 782041          | 12   |
| 9     | Connector, compression terminal, 500 kcmil Cu  | 677091          | 6  |
| 9     | Connector, compression terminal, 1000 kcmil Al | 651295          | 3  |
| 10    | Bolt, 5/8" x 16"                               | 780847          | 2  |
| 11    | Washer, curved, 2-1/2" x 2-1/2"                | 585135          | 2  |
| 12    | Washer, double coil lock, 5/8"                 | 584261          | 2  |
| 13    | Padlock, SNM-1                                 | N/A             | 1  |
| 14    | Tag holder                                     | 581799          | 1  |
| 15    | Nail, large head                               | 782416          | 2  |
| 16    | Number board                                   | N/A             | 1  |
| 17    | Flat washer, 1/4", bronze                      | 788022          | 2  |
| 18    | Hex nut, 1/4" bronze                           | 783321          | 2  |
| 19    | Cap screw, 1/4"x1", bronze                     | 784505          | 2  |
| 20    | Lock washer, 1/4", bronze                      | 788121          | 2  |
| 21    | Lag screw, 1/4"x4"                             | 785261          | 2  |
| 22    | Flat washer, 3/8"x1", galvanized               | 585020          | 2  |
| 23    | Bracket, number board mounting                 | 563225          | 2  |
| 24    | Cartridge, Burndy, yellow shell                | 013631          | 3  |

**6. References**

- SCL Construction Standard 0125.07;** "Scada-Mate Primary Switch, 600 A"
- SCL Construction Standard 0126.01;** "Primary Pole Termination Installation"
- SCL Construction Standard 0451.01;** "Grounding Electrodes for Distribution Poles"
- SCL Construction Standard 4501.50;** "Overhead Distribution Switch, 27 kV, Gang-Operated"
- SCL Material Standard 4501.50;** "Overhead Distribution Switch, 27 kV, Gang Operated"

## 7. Sources

**Hall, Alan**; SCL Electrical Engineer and subject matter expert for 0125.05

**Lu, Curtis**; SCL Standards Engineer and originator of 0125.05

**SCL Construction Standard D8-17** (canceled); “Switch, 600 A, 3-Pole, Gang-Operated, for Wood Pole Mounting, Upright”

**SCL Construction Standard D8-19** (canceled); “26/34.5 kV Upright Switch, 1200 A, 3-Pole, Gang-Operated, for Wood Pole Mounting”