Scada-Mate Primary Switch, 600 A

1. Scope

This standard covers the information necessary to install 600 A S& C Electric Co. Scada-Mate overhead primary switches on wood poles in the Seattle City Light (SCL) 26 kV primary distribution system. Requirements for vertical spacing, hardware, and installation instructions to connect the ground-level disconnect handle and control unit are included.

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

Refer to SCL 0125.05 for the installation of manual overhead primary switches.

2. Application

This standard provides direction to SCL engineers, crews, and contractors for the installation of a Scada-Mate primary switch on 26 kV wood distribution poles.

3. Requirements

Scada-Mate switches that SCL installs are specified to have a 600 A rating and be mounted in an upright position. These switches are used for sectionalizing feeders. Refer to SCL 4501.55 for switch purchasing specifications.

Key S&C documents should be provided with each switch. If not, they can be obtained from the manufacturer website or Standards contact.

Switches shall be installed in a horizontal orientation.

Switches shall be constructed as shown in figures 3a through 3d.

Figure 3a. Scada-Mate Switch Complete Assembly

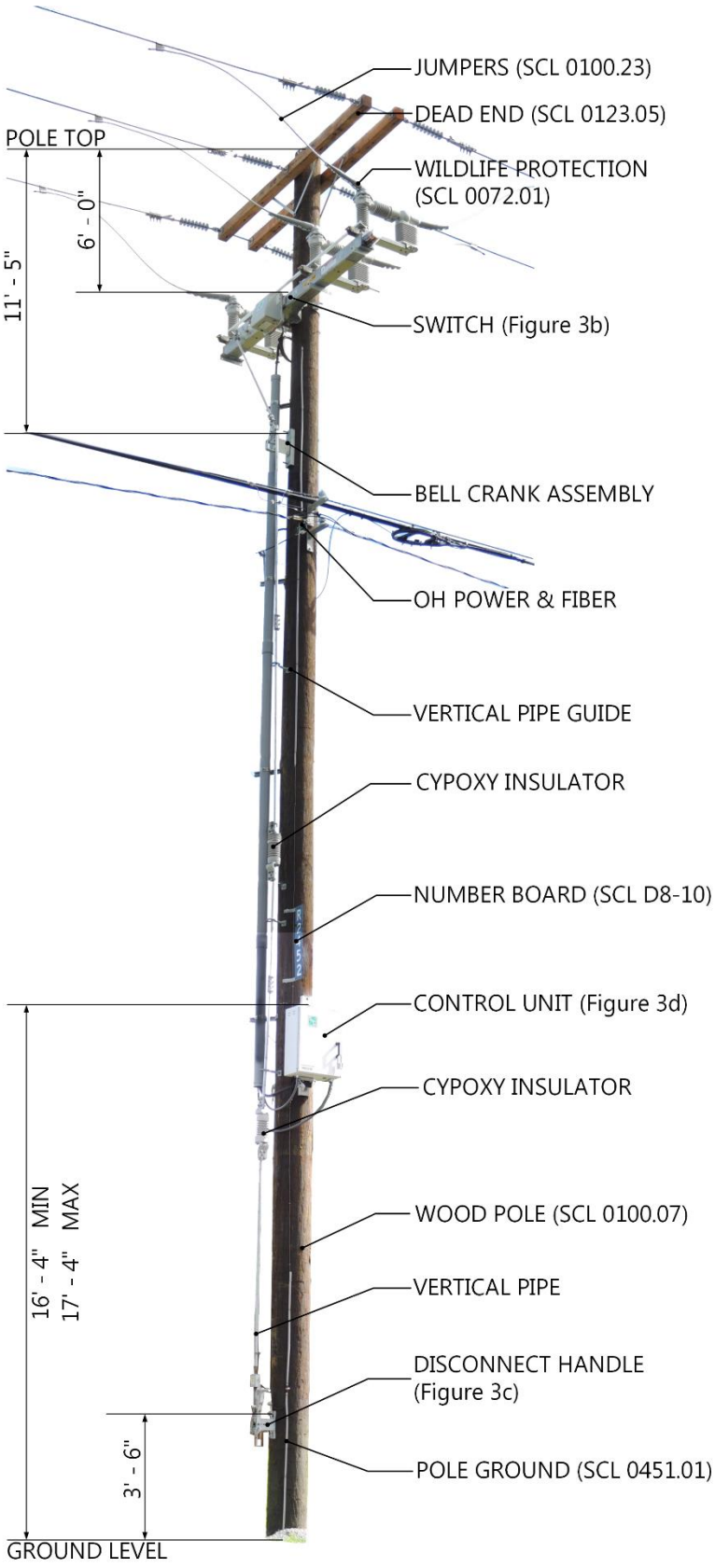


Figure 3b. Switch Mounting, Horizontal Orientation

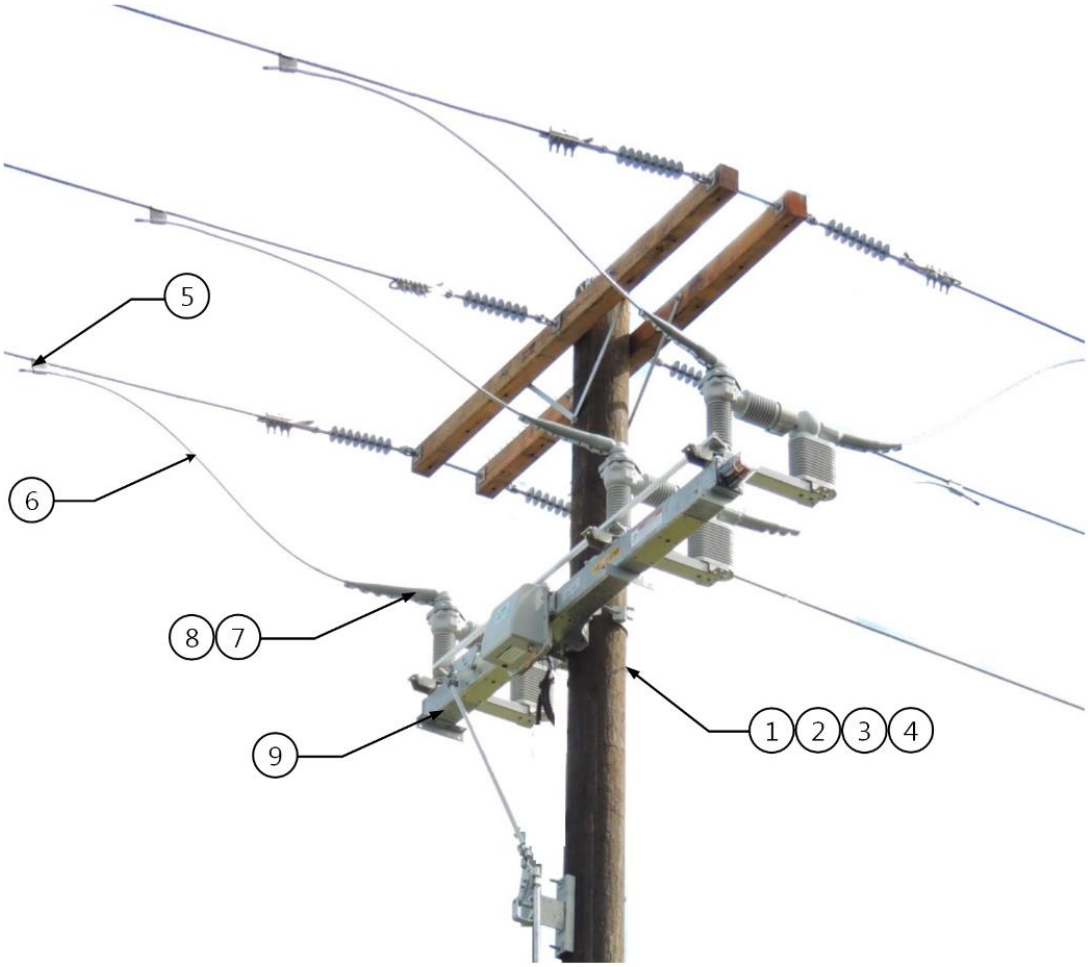
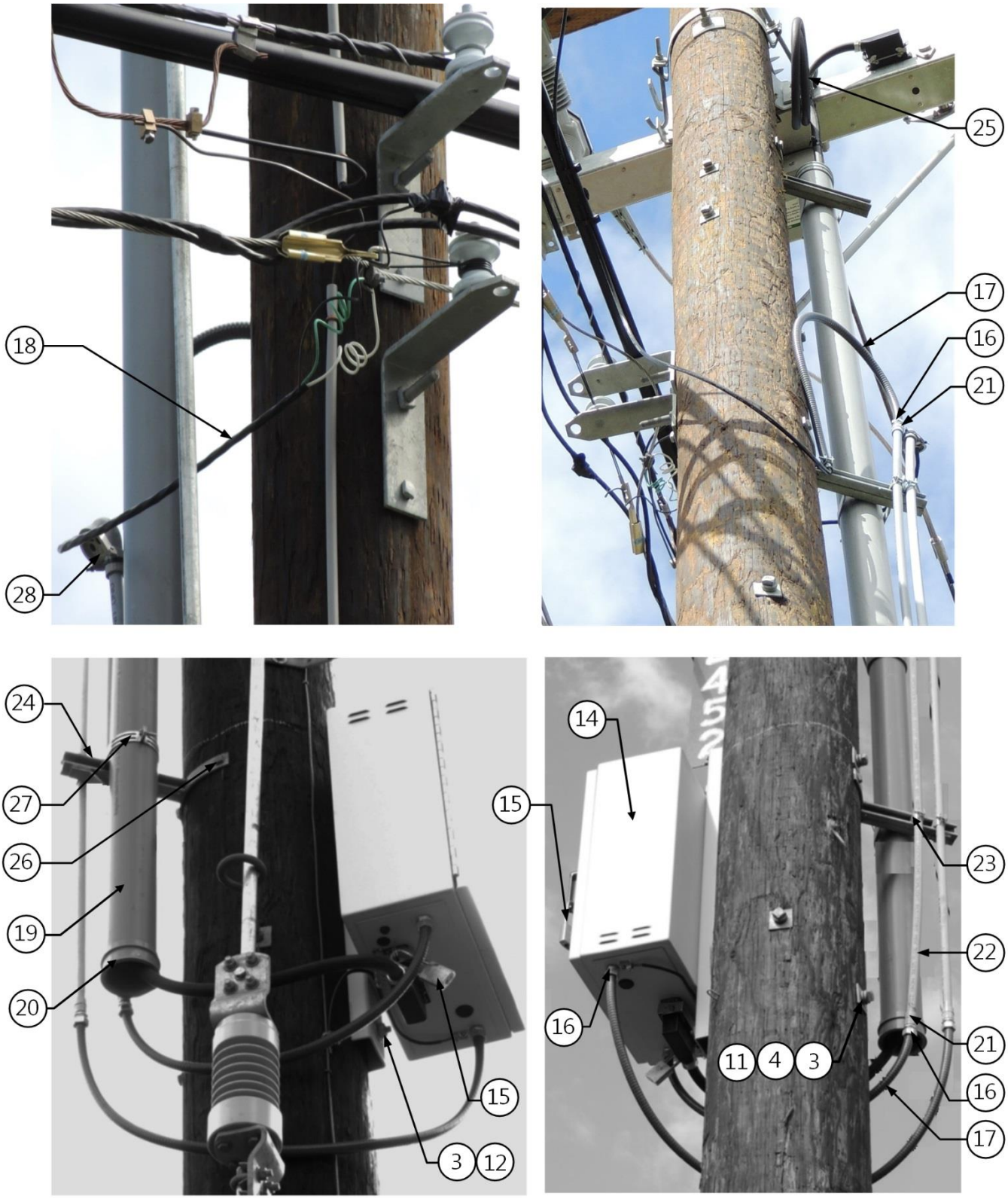


Figure 3c. Ground-Level Disconnect Handle Assembly

Figure 3d. Control Unit Assembly



4. Construction Notes

4.1 General

It is recommended that a pre-construction meeting be held at least one month before installation between Engineering, Communications, Relay, and other relevant entities to review the project and resolve any questions prior to commencing work.

Contact the engineer with any construction issues that may arise. Do not make changes in installation without prior discussion and agreement.

The construction notes contained herein are supplementary to the manufacturer-supplied installation instructions and documentation and the project work sketch.

It is recommended crews have the following resources on hand:

- S&C Scada-Mate Switching Systems Installation and Operation, Instruction Sheet 768-500
- S&C Omni-Rupter Switches Installation and Operation, Instruction Sheet 765-510
- S&C Drawing ED-8096-S103, Scada-Mate Ground-Level Disconnect Handle, Reciprocating Type Mechanism for Upright Switch, ¾" Pipe
- S&C Specification Bulletin 1045-31; S&C 6801 Automatic Switch Controls
- Sensor Ratio Sheet (Yellow Sheet)
- Project-specific installation sketch

4.2 Switch

The switch shall be installed with the top bolt hole of the switch bracket located at 6 feet below the top of the pole.

The first switch from the substation shall have voltage sensors facing upstream toward the substation. For all switches, other than the first switch from the substation, the open/close status indicator will be located on the road side. To achieve this, the pole may need to be rotated.

The open/close status indicator for the first switch from the substation can be on either side of the switch. For all other switches in the system, the open/close status indicator shall be on the road side.

Normally Open tie switches shall have voltage sensors facing the backup source when the backup feeder has not been automated.

A joint compound such as Penetrox shall be used between the switch terminal pad and the jumper terminal.

4.3 Ground-Level Disconnect Handle

Install the disconnect handle at a height of 42 inches above ground level, on the face side of the pole. If the handle cannot be installed on face side of the pole, it can be installed at the locations listed below:

On street side of the pole, less than 3 feet from street – The disconnect handle, when in the down position, shall be installed at a minimum of 15 feet above ground line.

On street side of the pole, 3 feet or more from street – The disconnect handle shall be installed at 3 feet-6 inches above ground line.

On sidewalk side of the pole, 2 feet or less from sidewalk – The disconnect handle, when in the down position, shall be installed at a minimum of 10 feet above ground line.

On sidewalk side of the pole, more than 2 feet from sidewalk – The disconnect handle shall be installed at 3 feet-6 inches above ground line.

4.4 Control Unit

The control unit shall be installed such that the bottom of the enclosure is 14–15 feet above ground level, above the lower Cypoxy insulator.

The control unit shall be fully programmed prior to switch installation.

Ensure that the Sensor Ratio Sheet (Yellow Sheet) for each switch is placed in the control unit document folder.

Coordinate a date with the Relay group to program control unit. This step requires Yellow Sheet information.

Verify that the switch control is energized from a 120 Vac source and the battery is connected.

The 120 Vac control power must come from a source opposite from the switch's voltage sensors.

The source (pole location, transformer, etc.) of the 120 Vac will be specified by the Engineer on the installation sketch.

The 120 Vac power should use #12 triplex. An acceptable alternative can be either Stock No. 612220 or 612222.

Stock spare 10A fuses (for 120 Vac power connection) inside the control box.

When ready to plug in the control cord cable to the switch going to the controller, remove the dust cover and VS/CS shorting blocks. Store dust cover and shorting blocks in the back of the control unit for future use. See Figure 4.4.

The S&C control cable socket at the bottom of the control unit is reversible and can be installed either way as needed depending on the orientation of the switch.

Coil excess control cable and attach to the switch hanger J-bolts via poly soft drawn wire. Do not coil the cable at other locations.

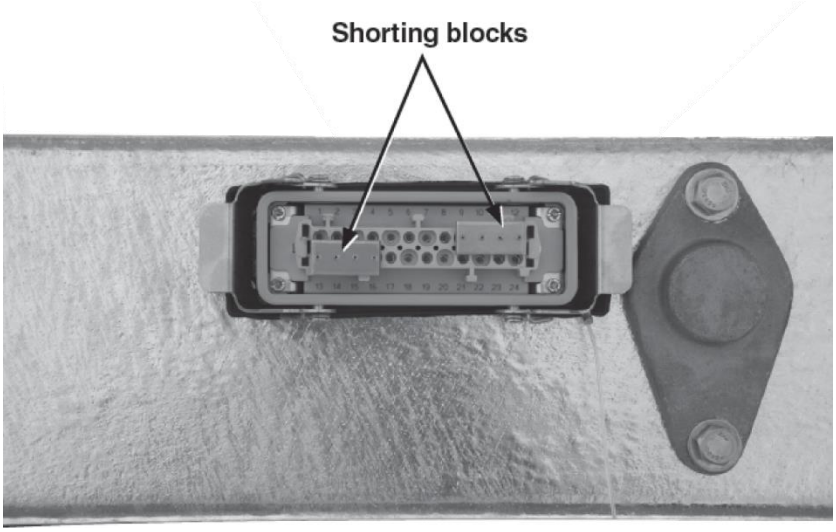
Install control, power, and fiber optics conduit as close to the pole as possible. Allow 4-1/2-in climbing space between the pole and the conduits.

Use 10-1/2 in standoffs when practical.

Liquidtight conduit for power cable terminates at the existing knockout in the bottom of the control cabinet in front of the 10A supply fuse.

Fiber optics and communications material and equipment will be supplied and installed by Communications. The only communications-related material included in this standard is 1/2-in PVC conduit.

Figure 4.4. Control Unit Receptacle at the Switch Base



4.5 Installing Wildlife Protection

Install S&C supplied avian (wildlife) protection boots over the jumpers as they enter the switch.

Also see SCL 0072.01.

4.6 Grounding and Bonding

Before the switch can be energized with 26 kV or 120 Vac power, the switch, neutral, control box, ground level disconnect handle, and the pole ground must be bonded. See SCL 0451.01 for information on pole grounding.

5. Material List

Table 5. Materials for Scada-Mate Primary Switch

Fig.	Compatible Unit	ID	Qty
3a-3d	Scada-Mate switch, 397.5 kcmil AAC, bare jumpers	SW600-397SCADA	
#	**Material Description**	**ID**	
1	Bolt, sq head, 5/8" x 18", pole classes H3 and H4	780848	4
2	Washer, curved sq, hot-dipped, galv., 4" x 4"	584775	2
3	Square nut, steel, zinc-coated, HDG, 5/8"	783078	5
4	Washer, double coil, helical spring lock, 5/8"	584261	5
5	397.5 kcmil run to 397.5 kcmil tap	013620	6
6	Wire, AAC, bare 397.5 kcmil	600113	60
7	Connector, compression, 4/0 AAC–500 kcmil	650267	6
8	Stainless steel bolt kit, 1/2-13 UNC x 2 SS	782040	12
9	Switch, upright, three-phase	013874	1
10	Grounding clamp, 1/2" x 13 NC, #8—2/0 str.	676200	1
11	Washer, flat sq., 2-1/4" x 2-1/4", 5/8"–4" bolt	585135	12
12	Bolt, sq head, 5/8" x 22", pole classes H3 and H4	780850	4
13	Bolt, DA, 5/8" x 30"	560530	3
14	Control unit, Automatic Restoration System	013876	1
15	Padlock, SNM-1	N/A	3
16	Connector, 1/2 in, straight body, male thread	012524	2
17	Conduit, liquidtight, non-metallic, 1/2"	013544	15
18	#12 triplex streetlight wire	014072	25
19	Conduit, PVC, Schedule 40, 4"	734523	30
20	End bell, PVC, 4"	734948	2
21	Female adapter, coupling, 1/2"	734508	3
22	Conduit, PVC, Schedule 40, 1/2"	734525	40
23	Strap, strut pipe / conduit, light duty, 1/2"	689754	7
24	Bracket without brace, 18"	686796	3
25	Strap, adjustable, plastic tie, 20"	735812	3
26	Screw, lag, galvanized, 1/2" x 4", fetter drive	785261	6
27	Strap, strut pipe / conduit, 4"	689772	3
28	Service entrance cap, 1/2"	013570	1

6. References

768-500; "S&C Scada-Mate Switching Systems, Outdoor Distribution (14.4 kV through 34.5 kV), Installation and Operation, Instruction Sheet 768-500," September 30, 2013

1045-31; "S&C 6801 Automatic Switch Controls Specification, Specification Bulletin 1045-31," November 9, 2015.

SCL Construction Standard 0072.01; "Wildlife Protection, Small Birds and Animals"

SCL Construction Standard 0125.05; "Overhead Primary Switch Installation"

SCL Construction Standard 0451.01; "Ground Electrodes for Distribution Poles"

SCL Material Standard 4501.55; "29 kV, Three-Phase, Overhead, SCADA-Controlled Load Interrupter Distribution Switching Systems"

7. Sources

768 31; "S&C Scada Mate Switching Systems, Outdoor Distribution (14.4 kV through 34.5 kV), For Remote Supervisory Control, Specifications, Specification Bulletin 768 31," March 16, 2015

148213R2 A1E3G35 S121; "25000 Volts, Scada Mate Switch, Outdoor Distribution Upright Mounting Configuration with R2 Operating Mechanism, Catalog No. 148213R2 A1E3G35 S121, S&C Drawing No. 492259.1.1, Revision 001," July 7, 2015

ED 8096 S103; "Scada Mate Ground Level Disconnect Handle, Reciprocating Type Mechanism for Upright Switch, ¾" Operating Pipe, Drawing No. ED 8096 S103, Revision 001," January 10, 2016

G 6232R5; "Printed Sheet, Drawing No. G 6232R5, Revision 005," October 23, 2002

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SCL Construction Standard D8-10; Typical Number Board Installation"

SCL Construction Standard 0100.07; "Wood Pole Installation"

SCL Construction Standard 0100.23; "Three-Phase Overhead Jumpers, Unfused"

SCL Construction Standard 0173.20; "Terminal Pole with Primary Switch, 600 Amp"

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