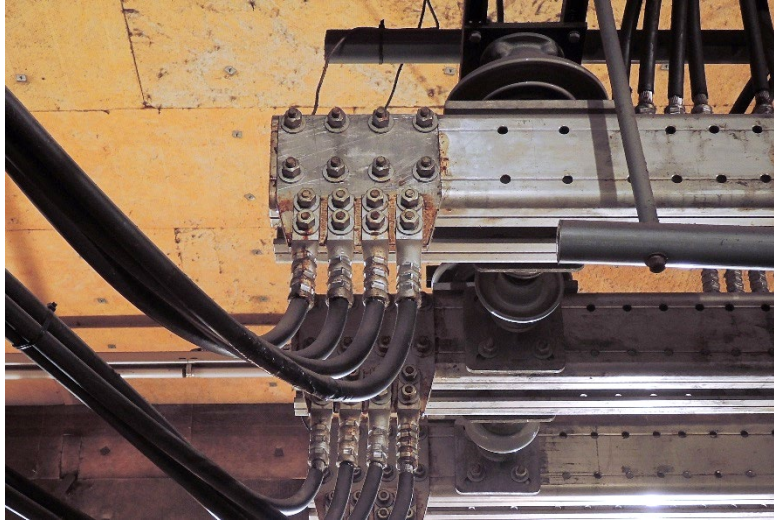


Preparation for Bolted and Compression Connections



1. Scope

This work practice describes the procedures to prepare connections for assembly. This work practice covers bolted and compression connectors.

For material required and connection configurations for bolted connections, see SCL 0575.02.

For required material and connection configurations for compression connections, see SCL 0575.14.

2. Application

This standard is for Seattle City Light (SCL) crews and contractors who install bolted and compression connectors.

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3. Bolted Connections

3.1 Aluminum to Aluminum

Step 1: Make sure that both surfaces are flat before starting this step. File off all burrs or irregularities and then vigorously clean all contact surfaces with a stiff, stainless steel wire brush to remove oxides. A bright surface should be obtained. Do not wire-brush plated contact surfaces.

Step 2: Immediately coat these contact areas with a liberal amount of contact sealant (Stock No. 726182).

Step 3: Re-clean the surfaces with the stainless-steel wire brush through the sealant. Do not remove the sealant.

Step 4: Install the fitting with bolts finger tight. If a generous bead of compound does not appear, open the joint and add more sealant.

Step 5: Tighten bolts in an alternating fashion (criss-cross). Bolts shall be tightened evenly with a torque wrench to the values shown in Section 4 of SCL 0575.02.

Step 6: Depending on amount of excess sealant squeezed out of the connection joint, either leave as is or lightly smooth sealant along the contact line.

Step 7: Remove all excess sealant entirely from cable insulation.

3.2 Aluminum to Copper

Step 1: Make sure that both surfaces are flat before starting this step. File off all burrs or irregularities and then vigorously clean all contact surfaces with a stiff, stainless steel wire brush to remove oxides. A bright surface should be obtained. Do not wire-brush plated contact surfaces.

Step 2: Immediately coat these contact areas with a liberal amount of contact sealant (Stock No. 726182).

Step 3: Re-clean the aluminum surface with the stainless-steel wire brush through the sealant. Do not remove the sealant.

Step 4: Install fitting with bolts finger tight. If a generous bead of compound does not appear, open the joint and add more sealant.

Step 5: Tighten bolts in an alternating fashion (criss-cross). Bolts shall be tightened evenly with a torque wrench to the values shown in Section 4 of SCL 0575.02.

Step 6: Depending on amount of excess sealant squeezed out of the connection joint, either leave as is or lightly smooth sealant along the contact line.

Step 7: Remove all excess sealant entirely from cable insulation. Position the aluminum conductor in such a way that prevents water from draining from the copper connector over (or into) the aluminum.

3.3 Copper to Copper

Step 1: Vigorously clean the contact surfaces with fine grit emery cloth sandpaper. Wipe clean with a rag.

Step 2: Tighten bolts in an alternating fashion (criss-cross). Bolts shall be tightened evenly with a torque wrench to the values shown in Section 4 of SCL 0575.02.

Note: Contact sealants are not normally required in copper connections. However, the use of sealant in severe corrosive environments and direct burial applications is recommended. Use Stock No. 725696.

3.4 Copper to Steel and Steel to Steel

Step 1: Clean steel contact surface with fine grit emery cloth sandpaper until a bright surface is obtained. Apply NO-OXID "A" (Stock No. 725696) to surface. Clean copper with same sandpaper and bolt connection together.

Step 2: Tighten bolts in an alternating fashion (criss-cross). Bolts shall be tightened evenly with a torque wrench to the values shown in Section 4 of SCL 0575.02.

Step 3: Wipe surfaces clean with a rag.

4. Compression Connections

4.1 Aluminum Connector to Aluminum Wire

Step 1: Vigorously clean the conductor contact area with a stainless-steel wire brush. Do not attempt to clean connector barrel. It is not necessary to apply sealant to the conductor. All connectors will have sealant applied at the factory, except full tension connectors with steel inner sleeves.

Step 2: Fully insert the conductor into the barrel and crimp. Crimping should begin nearest the center of sleeve type connectors. For closed-barrel type connectors crimping should begin at the closed end and work toward the open end. Excess sealant squeezed out of the connection joint may be smoothed out around the mouth of the barrel. All excess sealant must be removed from any cable insulation.

4.2 Copper Connector to Copper Wire

Step 1: Vigorously clean the conductor contact surfaces with a stainless-steel wire brush. Do not attempt to clean connector barrel. In most cases it is not necessary to apply sealant to the conductor or connectors. However, the use of sealant in severe corrosive environments and direct burial applications is recommended. In such cases use SCL Stock No. 725696.

Step 2: Fully insert the conductor into the barrel and crimp. Crimping should begin nearest the center of sleeve type connectors. For closed barrel type connectors, crimping should begin at the closed end and work toward the open end.

4.3 Aluminum Connector to Copper Wire

Step 1: Vigorously clean the conductor contact area with a stainless-steel wire brush. Do not attempt to clean connector barrel. It is not necessary to apply sealant to the conductor. All connectors will have sealant applied at the factory, except full tension connectors with steel inner sleeves.

Step 2: Fully insert the conductor into the barrel and crimp. Crimping should begin nearest the center of sleeve type connectors. For closed barrel-type connectors, crimping should begin at the closed end and work toward the open end. Excess sealant squeezed out of the connection joint may be smoothed out around the mouth of the barrel. All excess sealant must be removed from any cable insulation.

5. Contact Sealants

Gritted sealant (Stock No. 726180) is primarily used in aluminum compression connectors. Aluminum compression connectors have sealant applied at the factory, except full tension connectors with steel inner sleeves.

Non-gritted sealant (Stock No. 726182) is recommended for flat connections. No. 726182 is a petroleum base inhibitor. Stock No. 725696 is used for copper to steel and copper to copper and steel to steel as a corrosion preventive.

Care should be taken to prevent excess sealant from getting on the hardware since torque values will be affected if the hardware threads become over-lubricated.

6. References

SCL Construction Standard 0575.02; “Bolted Connections”

SCL Construction Standard 0575.14; “Splices, Straight Compression”

7. Sources

ANSI/NEMA CC 1-2018; Electric Power Connections for Substations

Lu, Curtis; SCL Standards Engineer and originator of 0576.03

SCL Construction Standard DU5-1/NSV-30 (canceled); “Joint Preparation for Bolted and Compression Joints with Copper and/or Aluminum (Plus Steel to Copper)”