
Steel Conduit Risers

1. Scope

This standard covers the installation of primary and secondary steel conduit riser assemblies on Seattle City Light (SCL) distribution system wood poles. Instructions for installing the riser to the pole are included, along with requirements for spacing and hardware.

Riser extensions are covered in SCL 0126.04.

Primary pole terminations are covered in SCL 0126.01.

Streetlight pole terminations are covered in SCL 1714.50.

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 who specify or install steel conduit risers on SCL distribution system wood poles.

3. Requirements

3.1 General

Only one set of conduit risers (primary, secondary, communications) on a standoff bracket shall be allowed per pole, as shown in figures 3.1a, 3.1b, and 3.3.

All SCL risers and bends shall be rigid steel. See SCL 7050.05. Non-SCL communication conduit risers can be PVC.

All conduit risers originating from the direction of the face of the pole shall be constructed as shown in Figure 3.1a and 3.1b. The face of the pole is the side of the pole where the brand, gain notch, and date nail with the last two digits of the installation year are located. It is typically the side of the pole where the equipment (transformers, switches, and conduits) are attached to a pole.

All conduit risers originating from the back and around the pole shall be constructed as shown in Figure 3.1b, 3.1c and 3.1d.

Two, three, and five inch, 22.5-degree steel bends are bent in the field. Additional straight sections have been provided for field bending.

For primary risers, below-grade conduits shall be encased and constructed as shown in SCL 0222.02. The encasement shall end before the elbow.

For secondary risers, below-grade conduits shall be constructed as shown in SCL 0224.07 for conduits in private property and for conduits in the right-of-way or SCL easement areas.



A single one-inch non-SCL riser can be installed on the surface of the pole. The conduit shall be in the quadrant between the roadside and the face of the pole, as shown in Figure 3.3. Conduit straps shall be installed, at a minimum, every 5 feet.

Figure 3.1a. Steel Conduit Riser, Top View

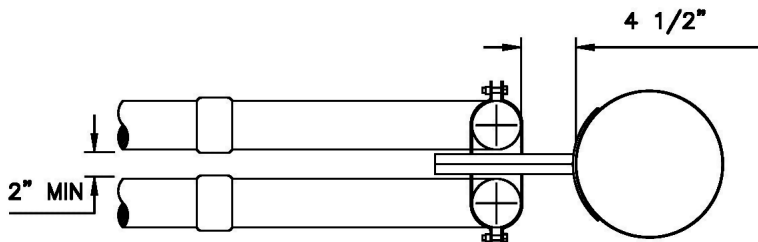


Figure 3.1b. Steel Conduit Riser, Side View

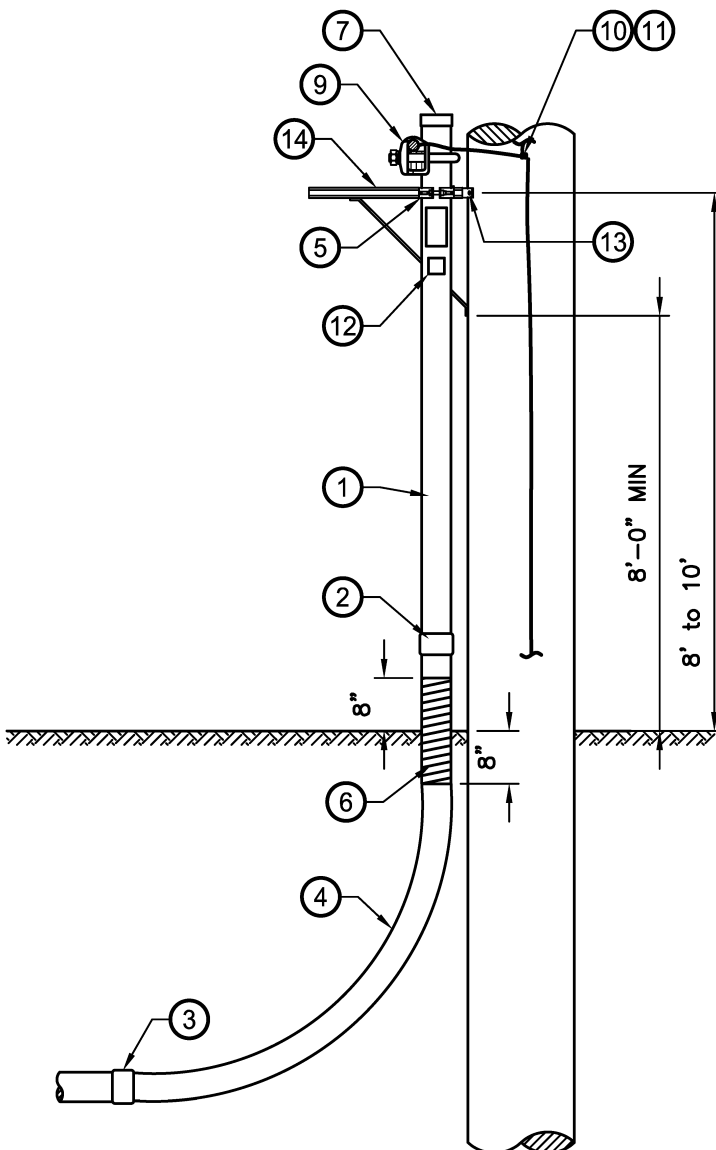


Figure 3.1c. Wraparound Steel Conduit Riser, Top View

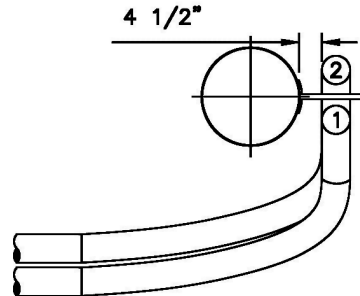
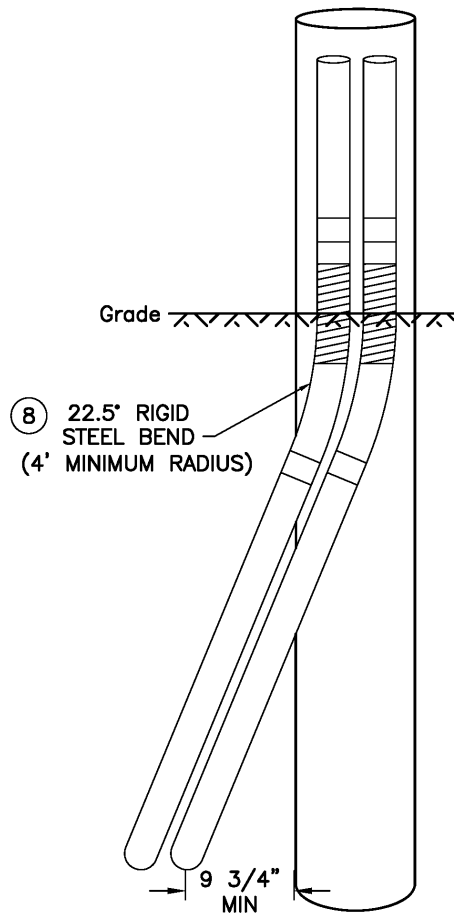


Figure 3.1d. Wraparound Steel Conduit Riser, Profile View



3.2 Backfill

Backfill around the pole shall be Controlled Density Fill (CDF) trench backfill per SCL 0226.11 and the Seattle Standard Specifications.

3.3 Orientation and Arrangement

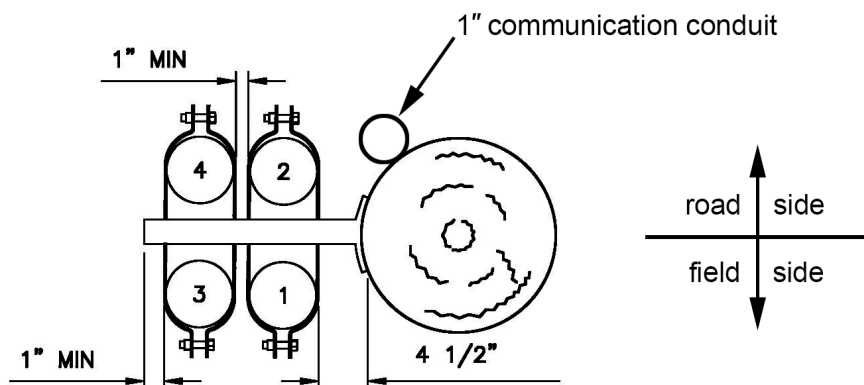
The first ten feet of conduit above grade shall be attached to a bracket that is installed on the face of the pole. If there is more than one conduit, arrange the highest voltage conduit closest to the pole while attaching to alternating sides of the bracket as shown in Figure 3.3.

The closest SCL riser conduit shall be 4.5 inches away from the face of the pole. Each additional riser conduit installed shall be 1 inch from the conduit next to it.

The closest non-SCL riser conduit shall be no less than 10 inches from the face of the pole.

Each conduit shall be attached to the bracket with a three-piece, electro-galvanized strut strap. If there are wraparound conduit risers and standard risers, the wraparound riser shall be located closer to the pole.

Figure 3.3. Orientation and Arrangement of Riser Conduits



3.4 Bracket

One riser bracket (see SCL 6867.50) shall be used per above grade conduit section. The maximum riser bracket length shall be 26 inches. If a 5-in conduit is being installed, a 26-in bracket shall be used.

The lowest point of the lowest bracket on the pole shall be located a minimum of 8 feet above grade.

The lowest bracket on a pole shall be a braced bracket.

If a bracket exists and has enough space, add conduits to it. If there is not enough space, replace with a larger bracket. Contact a SCL engineer if there are more than 4 conduits on a bracket.

3.5 Grounding

A ground clamp (see SCL 6762.7) shall be installed below the top of the steel conduit and above the riser bracket as shown in Figure 3.1b.

The clamp shall be connected to the pole ground using #4 AWG solid copper wire.

When more than one steel conduit is installed, use one continuous piece of copper wire between ground clamp bushings and connect once to the pole ground.

Final connection to pole ground shall be performed by the SCL overhead crew. Materials are listed in Table 5b.

A ground clamp shall be installed below grade when required by SCL 0461.10.

3.6 Identification

A label identifying the facility and the originating facility shall be affixed to the riser directly below the conduit strap on the side facing away from the bracket.

A call before you dig sticker shall also be affixed directly below the facility label at no lower than 5 feet above grade.

Identification is installed by the SCL underground crew. Materials are listed in Table 5c.

3.7 Installation

PVC pipe wrap shall be wrapped around the conduit starting 8 inches below the ground level to 8 inches above the ground level.

An end cap shall be installed on all spare conduits.

All conduit located above grade shall be vertical.

4. Construction Notes

The pole shall be temporarily guyed or braced before excavation is made at the base of the pole. See SCL 0101.75.

Remove all temporary brackets and braces located below 8 feet prior to backfilling.

5. Material Lists

Table 5a. Materials for Steel Conduit Riser Assemblies

Fig	Compatible Unit	ID	Quantity			
3.1b	Riser, 2" assembly	DRGS-RISER2				
3.1b	Riser, 3" assembly	DRGS-RISER3				
3.1b	Riser, 4" assembly	DRGS-RISER4				
3.1b	Riser, 5" assembly	DRGS-RISER5				
#	Material Description	ID				
1	Conduit, rigid steel, 2"	734741	-	-	-	10
1	Conduit, rigid steel, 3"	734743	-	-	10	-
1	Conduit, rigid steel, 4"	734745	-	10	-	-
1	Conduit, rigid steel, 5"	734747	10	-	-	-
2	Coupling, rigid steel conduit, 2"	731096	-	-	-	1
2	Coupling, rigid steel conduit, 3"	731098	-	-	1	-
2	Coupling, rigid steel conduit, 4"	731100	-	1	-	-
2	Coupling, rigid steel conduit, 5"	731102	1	-	-	-
3	Conduit adapter, PVC to steel 2"	734544	-	-	-	1
3	Conduit adapter, PVC to steel 3"	734537	-	-	1	-
3	Conduit adapter, PVC to steel 4"	734539	-	1	-	-
3	Conduit adapter, FG to steel 5"	TBD	1	-	-	-
4	Elbow, rigid steel, 2"	734820	-	-	-	1
4	Elbow, rigid steel, 3"	734822	-	-	1	-
4	Elbow, rigid steel, 4"	012176	-	1	-	-
4	Elbow, rigid steel, 5"	734826	1	-	-	-
5	Strap, strut pipe/conduit, 2"	689764	-	-	-	1
5	Strap, strut pipe/conduit, 3"	689768	-	-	1	-
5	Strap, strut pipe/conduit, 4"	689772	-	1	-	-
5	Strap, strut pipe/conduit, 5"	689774	1	-	-	-
6	Tape, pipe wrap, PVC, 2" x 10 mil (roll)	736730	1	1	1	1
7	Plug, PVC, 2"	734938	-	-	-	1
7	Plug, PVC, 3"	734940	-	-	1	-
7	Plug, PVC, 4"	734942	-	1	-	-
7	Plug, PVC, 5"	734943	1	-	-	-
8	Conduit, rigid steel, 22.5°	013749	-	1	-	-
13	Bolt, lag, 1/2" x 4"	785261	3	3	3	3
14	Bracket, pole riser, w/ brace, 18"	686796	1	1	1	1

Table 5b. Steel Riser Grounding

Fig	Compatible Unit	ID	Quantity			
3.1b	2" Steel riser ground	GRND-RISER2				
3.1b	3" Steel riser ground	GRND-RISER3				
3.1b	4" Steel riser ground	GRND-RISER4				
3.1b	5" Steel riser ground	GRND-RISER5				
#	Material Description	ID				
9	Clamp, conduit grounding 2"	676283	-	-	-	1
9	Clamp, conduit grounding 3"	676285	-	-	1	-
9	Clamp, conduit grounding 4"	676286	-	1	-	-
9	Clamp, conduit grounding 5"	676287	1	-	-	-
10	Connector, vise jaw #4 AWG	012173	1	1	1	1
11	Wire, #4 AWG, Cu soft drawn	610208	3	3	3	3

Table 5c. Steel Riser Labeling

#	Material Description	ID	Quantity
12	"Call Before You Dig" label	765255	1

6. References

- City of Seattle Standard Plans** for Municipal Construction, 2020 Edition
- City of Seattle Standard Specifications** for Road, Bridge, and Municipal Construction, 2020 Edition
- SCL Construction Standard 0126.01**; "Primary Pole Terminations"
- SCL Construction Standard 0126.04**; "Riser Extensions"
- SCL Construction Standard 0222.02**; "Requirements for Duct Banks in the Public Right-of-Way"
- SCL Construction Standard 0224.07**; "Requirements for Secondary Conduit Installation"
- SCL Construction 0226.11**; "Backfill Operations, General Requirements"
- SCL Construction Standard 0461.10**; "Grounding Electrodes for Handholes and Vaults"
- SCL Construction Standard 1714.50**; "Underground Streetlight Systems"
- SCL Material Standard 6762.7**; "Ground Clamps Parallel or Transverse Cable Connection(s) to Rod or Pipe"
- SCL Material Standard 6867.50**; "Bracket, For Pole Riser Conduit"
- SCL Material Standard 7050.05**; "Zinc-Coated Steel Conduit and Fittings"
- SCL Work Practice 0101.75**; "Pole Holds"

7. Sources

Chao, Yaochiem; SCL Standards Engineer and subject matter expert for 0224.34

Hall, Alan; SCL Electrical Engineer and subject matter expert for 0224.34

Lu, Curtis; SCL Standards Engineer and originator of 0224.34

SCL Construction Standard U7-10/NDK-70 (canceled); "Conduit Risers on Poles"

SCL Construction Standard U7-10.1/NDK-80 (canceled); "Secondary Conduit Riser Pole Base Detail"

SCL Construction Standard U7-10.2/NDK-90 (canceled); "Primary Conduit Riser Pole Base Detail"

SCL Construction Standard U7-10.9/NDK-120 (canceled); "Grounding Conduit Risers on Poles"