

Requirements for Secondary Conduit Installation



1. Scope

This standard provides the general requirements for the construction and installation of secondary conduits within the Seattle City Light (SCL) service territory. This standard also applies to conduits within SCL easement areas.

Job-specific requirements are not covered in this standard. Refer to the SCL Requirements Letter for job-specific requirements.

2. Application

This standard provides direction to SCL crews, contractors, and customers about where and how to properly install secondary (0–600 V) conduits in the right-of-way and on private property.

For primary (601 V–50,000 V) conduit and duct bank installation, see SCL 0222.02.

Conduits installed in SCL easements shall meet the requirements of conduits in the right-of-way.

For clearances to other underground structures and utilities, see SCL 0214.00.

3. Conflict

Where conflict exists between SCL requirements, the following order of precedence shall apply:

1. Project-specific Customer Requirements Package, including Service Construction Drawing
2. SCL 0224.07
3. Other SCL standards

4. Requirements

4.1 General

General requirements are shown in Table 4 and Figures 4a and 4b.

Table 4. General Requirements

Location	Right-of-Way		Private Property	
	Network	Looped Radial	Network	Looped Radial
Area	Network	Looped Radial	Network	Looped Radial
Voltage	0–600 V	0–600 V	0–600 V	0–600 V
Function	System or Service	System or Service	System or Service	System or Service
Cover (minimum)	36 in	36 in	24 in	24 in
No. of conduits (minimum)	2	1 ^a	2	1
Encasement	Yes for 4" and larger	No	Yes for 4" and larger	No
Marking Tape	Yes	Yes	Yes	Yes
Backfill	CDF	CDF	CDF	Native soil

^a A minimum of two conduits are required for street crossings.

Figure 4a. General Requirements, Looped Radial Conduits

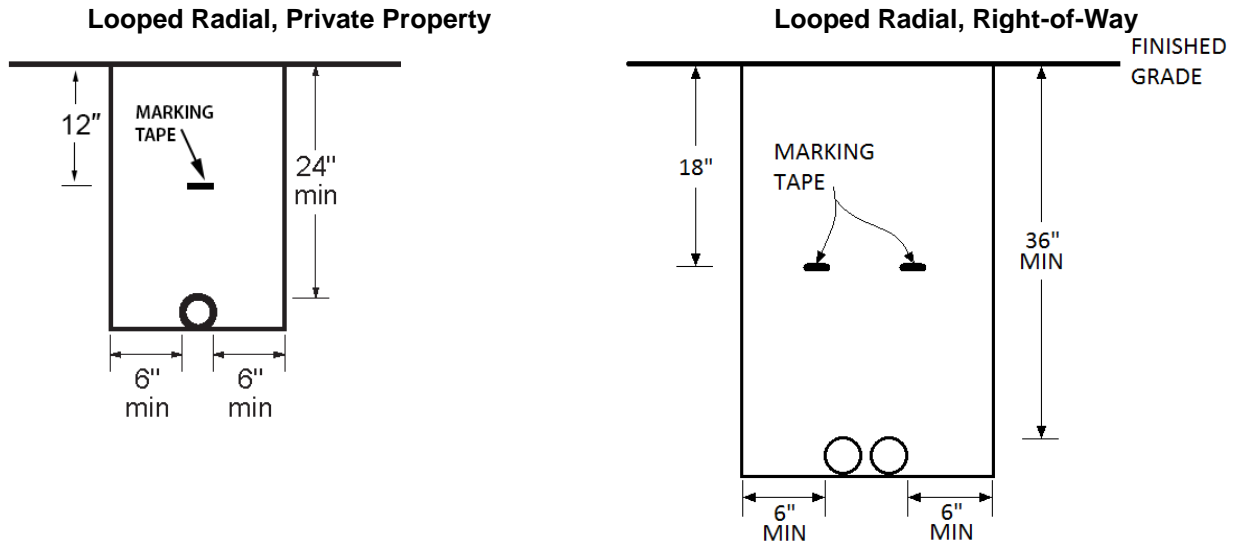
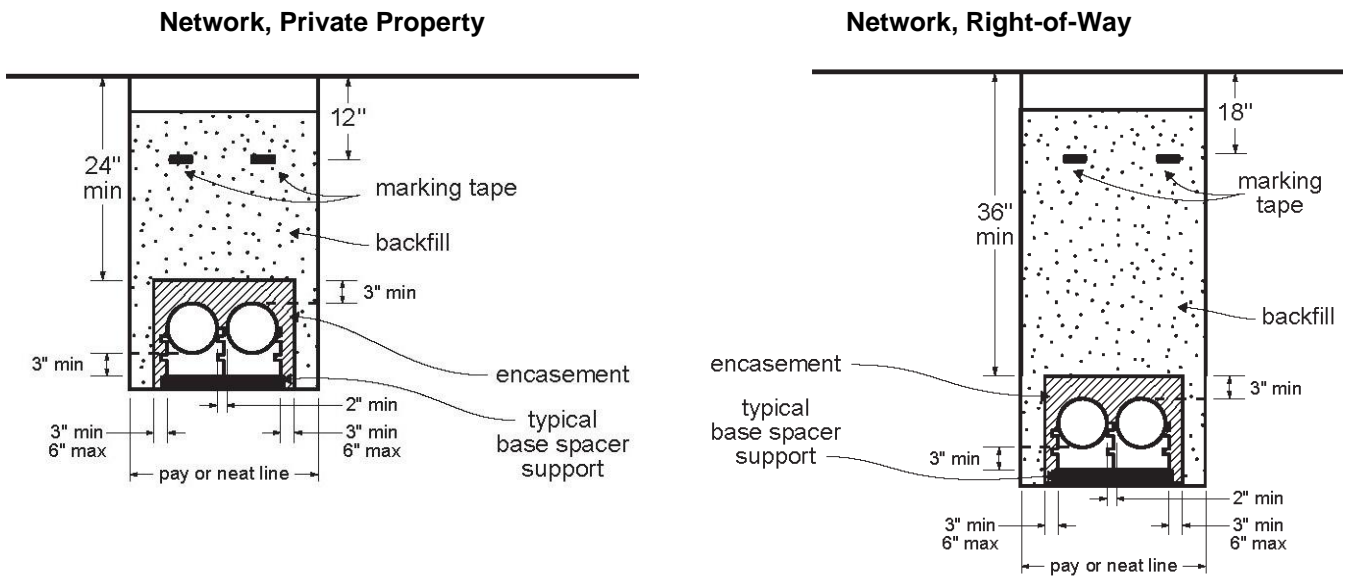


Figure 4b. General Requirements, Network Conduits



Conduit runs shall not exceed 270 degrees in bends between pulling access points, including riser bends under the termination point and at the pole.

A pulling handhole may be necessary to reduce the total length of service conduit between pulling access points to 150 ft.

5. Location/Clearances

Secondary conduits shall be installed in locations specified by the SCL engineer.
Cover from the top of the conduit or encasement to grade is required. See Table 4.
For clearances to non-SCL facilities, conduits, and pipes, see SCL 0214.00.

6. Conduit

Conduit shall be SCL-approved material specified for direct burial.
Conduit size and number of conduits are specified by the SCL engineer.
Conduits shall be mandreled and cleaned per SCL U2-11.40/NDK-40.
Factory and field straight-cut ends shall be chamfered throughout the duct run.
Conduits can be used as specified in Table 6a.
All Network conduits 4 inches and larger shall be encased. See SCL 0222.02 for encasement details.
If four or more conduits are required, install duct bank per SCL 0222.02.
If any conduits in a duct bank require encasement, all conduits shall be encased.

Table 6a. Allowed Conduit Materials

	Schedule 40 PVC (SCL 7015.05)	Rigid Steel (RGS) (SCL 7050.05)	Schedule 80 PVC (SCL 7020.05)
Straight	Yes	Yes	Yes ^b
Bend	No ^a	Yes	Yes ^b

^a Typical unless otherwise specified by the SCL engineer.

^b Network only, for conduits smaller than 4 inch.

Table 6b. Minimum Bend Radius

Conduit (in)	Minimum Bend Radius (in)
3	36
4	48
5 ^b	60

^b Network only.

Note: Bending PVC conduits with heat is not allowed.

6.1 New Conduit Termination

For termination of new conduit into a handhole, see SCL 0231.01.
For termination of new conduit into a conduit riser, see SCL 0224.34.
Conduits shall enter vaults perpendicular to the vault wall no more than 18 inches from the adjacent wall.

6.2 Existing Conduit Termination

For termination of existing conduit into a new handhole or vault, see U2-11.3/NDK-30.

7. Trench

The trench shall be excavated with a minimum spacing of 6 inches from the conduit to the closest trench wall.

The bottom of the trench shall be free of debris and fine-graded by hand to remove sharp, embedded rocks and loose stones over 1/2 inches in size. Or, the trench shall be over-excavated and replaced with bedding material to cover protruding rocks and stones by a minimum of 2 inches. The bottom shall be graded even. Bedding material shall be sand.

8. Spacers

Spacers for conduit separation shall be plastic lock-type (see SCL 7015.80) of such configuration to give the required separation between conduit and earth, as shown in Figure 3.

Horizontally, spacers shall be placed 5 ft apart in both straight and bending sections of duct banks and a minimum of one foot away from any coupling, fitting or end bell.

Base spacers shall be used to obtain clearance to subgrade material under the conduit for the placement of the 3-in minimum of encasement.

Base spacers may also be used to obtain 3-in side cover of conduit in bends.

Two-inch concrete blocking, twice the area of the foot, shall be provided under the base spacers.

Secure conduit to spacers in order to prevent flotation and deflection during encasing.

9. Backfill

For direct-buried conduit, backfill with clean native soil.

If encasement is used, use Controlled Density Fill (CDF) to backfill.

10. Identification

Install two, 3-in-wide, red detectable underground marking tapes over the conduits at 18 inches below the finished grade when required. See Table 4 and Figures 4a and 4b.

11. Transition

A proper transition is required when transitioning conduits onto private property from conduits in the right-of-way. See SCL 0222.02 for requirements on changes in direction.

12. Inspection

The following items must be inspected by SCL before backfill is installed:

- Conduit trench
- Trench bedding
- Proper conduit installation and adherence to engineering design and SCL standards
- Conduit mandreling and cleaning
- Trench backfill material

Inspection points shall be adhered to for all installation projects. Inspection points are put in place to ensure conformity to SCL requirements. Failure of the customer to request an inspection may result in additional requirements. See SCL 0222.02 Section 5 for conduit details. See SCL U2-11.40/NDK-40 for mandreling and cleaning details.

13. References

SCL Construction Standard 0214.00; “Clearances between SCL Underground Structures and Other Utility Structures in the Public Right-Of-Way”

SCL Construction Standard 0222.02; “Requirements for Primary Conduit and Duct Bank Installation”

SCL Construction Standard 0224.34; “Steel Conduit Risers”

SCL Construction Standard 0231.01; “Secondary Handhole Installation and Grounding”
U2-11.3/NDK-30; “Termination Of Existing Ducts in New Vaults or Manholes”

SCL Construction Standard U2-11.40/NDK-40; “Mandreling and Cleaning of Ducts and Conduits”

SCL Material Standard 7015.05; “Schedule 40 PVC Conduit and Fittings”

SCL Material Standard 7015.80; “Conduit Spacers for PVC and FG Conduit”

SCL Material Standard 7020.05; “Schedule 80 PVC Conduit and Elbows”

SCL Material Standard 7050.05; “Zinc-Coated Steel Conduit and Fittings”

14. Sources

Chao, Yaochiem; SCL Standards Engineer, originator, and subject matter expert for 0224.07 (yaochiem.chao@seattle.gov)

Edwards, Tommy; SCL Electrical Reviewer and subject matter expert for 0224.07 (tommy.edwards@seattle.gov)

Perander, Eivind; SCL North Distribution Supervisor and subject matter expert for 0224.07 (eivind.perander@seattle.gov)

SCL 0224.05 (canceled); “Requirements for Underground Services on Private Property”