Clearances Between SCL Underground Structures and Other Structures

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2. Scope

This standard covers clearance requirements between Seattle City Light (SCL) underground structures and other utilities underground structures located in the public right-of-way and on private property. This includes both Network and Looped Radial underground structures. Underground structures include vaults, handholes, basins, fire hydrants, duct banks, conduits, pipes, and root balls.

This standard addresses the minimum required horizontal and vertical clearances between structures and required operating space.

The requirements may be code based or safety related.

3. Application

This standard shall be used by SCL engineers, operations personnel, consultants, and contractors when designing and/or constructing vaults, handholes, manholes, conduits below grade that are in the vicinities of other utilities installations. These could be gas, water, sewer, steam, telephone, cable TV, and fiber optics. Other utilities and contractors should also follow these provisions when installing their facilities near any SCL facility.

Reasons for maintaining these minimum clearances are for allowing enough space for future equipment maintenance, assuring a safe environment to the public, avoiding thermal interferences between cables, repair and replacement of other utilities, and minimizing impact of other utilities failures on SCL equipment and vice versa.

The minimum clearances defined in this document are per SCL specifications taking into account the City of Seattle Land Use Code, Right-of-Way Improvement Manual, and Standard Plans and Specifications; and the Washington Administrative Code (WAC). SCL specifications are derived from engineering and operations experience.

For any deviation from the prescribed clearances, an agreement has to be reached between SCL Engineering and the interested parties.

4. Design and Construction Notes

4.1 Covers/Hatch

When reviewing designs, engineers should take into account cover or lid size for future needs.
4.2 Vault Knockouts

The knockout zone shall be eight feet long and the width shall equal the width of the knockouts plus 2 ft. The height of the knockout zone shall be equal to the height of the SCL facility. This zone should be reserved for future extensions of SCL duct runs unless parties receive explicit permission from SCL Engineering.

Non-SCL utility manhole construction in knockout zones shall be approved by SCL Engineering. These zones are planned for future conduit extensions. See Figure 4.2a.

No utility handholes or other underground structures shall be installed in the area outside and adjacent to knockouts. See Figure 4.2a.

No installations below SCL facilities shall occur without written SCL Engineering approval. See Figure 4.2b.

No installations above other existing utilities’ structures shall occur without written SCL Engineering approval. See Figure 4.2b.

Figure 4.2a. Knockout Zone, Plan View
4.3 Shoring

During construction projects shoring piles and shoring lagging shall maintain a clearance from SCL conduits, duct banks, handholes, manholes and vaults of at least 1 ft.

4.4 Overhead Clearance for SCL Underground Structures

To allow crane access to SCL vaults and manholes for lowering and raising equipment, the minimum vertical height above the underground facilities, of overhead structures and any encumbrances, such as roadway columns, shall be 25 ft.

4.5 Access and Working Space for SCL Underground Structures

To allow crane access to SCL vaults and manholes, facilities must be located to allow permanent SCL vehicular (truck) access to the facility for installation and service of electrical equipment. SCL facilities must have a permanent, level, unobstructed, 8-ft wide working area around the facility for access to the facility and knockout zones.
5. Minimum Clearances in the Right-of-Way between SCL Vaults or Handholes and Non-SCL Facilities, Conduits and Pipes

Non-SCL conduit can be 3 ft from SCL facility but must be below knockout zone.

If SCL knockout zones are planned for 115 kV or 230 kV facilities, horizontal clearance shall be 5 ft from SCL facilities to non-SCL facilities and conduits (except for high pressure steam or heat source).

Figure 5a. Minimum Horizontal Clearance, Plan View
Figure 5b. Minimum Horizontal Clearance, Elevation, Side View

Note: If SCL knockout zones are planned for 115 kV or 230 kV, horizontal clearance shall be at least 5 ft between SCL knockout zones and non-SCL conduit or pipes.
6. Minimum Clearances in the Right-of-Way between SCL Conduits or Duct Banks and Non-SCL Facilities, Conduits and Pipes

If SCL conduit or duct bank contains 115 kV or 230 kV, the horizontal clearance between SCL facilities and non-SCL facilities shall be a minimum of 5 ft and the vertical clearance shall be a minimum of 1 ft.

Figure 6a. Minimum Horizontal Clearance, Non-Water Structures, Plan View
Figure 6b. Minimum Horizontal Clearance, Water Structures, Plan View
Notes
1. High pressure steam log or any heat source shall not cross SCL conduit or duct bank without SCL Engineering approval.
2. Vertical clearance applies to conduits crossing perpendicular underneath SCL conduits or duct banks. Non-SCL conduits are not allowed to be installed directly above or below parallel to SCL conduits or duct banks.
3. Crossing of sewer, storm, or water shall be perpendicular, except with written approval from SCL Engineering.
4. Backfill and bedding shall be installed as specified in Standard Plan 350 or 285.
5. Crossing under water, sewer, or storm laterals or mains requires support plan approved by the appropriate water AHJ and observation by that AHJ’s construction management.
6. Conduit crossing over water, sewer, or storm laterals or mains shall be reinforced for a minimum of 5 ft to either side. See SCL U2-11.2/NDK-20.
7. Water, sewer, storm AHJ shall be notified when any cast iron pipe is exposed.
7. Minimum Clearances on Private Property between SCL Conduits or Duct Banks and Non-SCL Facilities, Conduits, and Pipes

Figure 7. Minimum Horizontal Clearances, Plan View
8. Minimum Clearances in the Right-of-Way between SCL Structures and Vegetation

There shall not be any planted trees within 2 ft of SCL vaults, manholes, handholes, conduits, and duct banks. The distance shall be measured from the tree’s root ball to the structure’s surface.

**Figure 8a. Vegetation Clearance, Plan View**

![Diagram showing vegetation clearance around SCL structures with 2 ft clearance.]
Figure 8b. Vegetation Clearance, Elevation View

9. Minimum Clearances in the Right-of-Way between SCL Structures and Various Other Structures

No installation is allowed directly above or below SCL facilities without written SCL Engineering approval.

For setback or clearance requirements from bioretention cells and rain gardens, see Seattle Rights-of-Way Improvement Manual Chapter 4, 4.17.5.

Table 9. Minimum Horizontal Clearances

<table>
<thead>
<tr>
<th>Other Structures</th>
<th>Horizontal Clearance from SCL Structures (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Conduits or Duct Banks Rated to 26 kV</td>
</tr>
<tr>
<td>Fire hydrants/water meters</td>
<td>3</td>
</tr>
<tr>
<td>Street curbing</td>
<td>1</td>
</tr>
<tr>
<td>Building footings</td>
<td>3</td>
</tr>
<tr>
<td>Metro buses and strain poles (overhead operations)</td>
<td>3</td>
</tr>
<tr>
<td>Concrete support columns</td>
<td>3</td>
</tr>
<tr>
<td>Concrete support column footings</td>
<td>3</td>
</tr>
<tr>
<td>Temporary construction shoring piles</td>
<td>1</td>
</tr>
<tr>
<td>Water maintenance holes</td>
<td>5</td>
</tr>
<tr>
<td>CBs and inlets</td>
<td>3</td>
</tr>
</tbody>
</table>

<sup>a</sup> To facility lid or hatch
10. Location and Orientation of Vaults and Secondary Handholes at Grade

10.1 577 Vaults

577 vaults are typically used as a pulling vault or a loadbreak vault. The purpose of specifying the location and orientation of the vault is to ensure proper working space for SCL operations personnel.

10.1.1 Preferred Location and Orientation

The preferred orientation for a 577 vault is the length of the vault perpendicular to the curb as shown in Figure 10.1.1. For 577 vaults with junction boxes, additional clearances are required. See Figure 10.1.3.

Figure 10.1.1 Preferred Location and Orientation for 577 Vault

![Diagram of 577 Vault Location and Orientation]

The vented section of the vault shall be located in the sidewalk.

When installed within a planting strip, the top of vault shall be set 1/2 inch above surrounding grade. Slope grade away from vault for drainage.

10.1.2 Alternate Location and Orientation

The alternate orientation for a 577 vault is the length of the vault parallel to the curb as shown in Figure 10.1.2. The location of the vault shall be entirely within the planting strip.
When vault or handhole extends into the sidewalk area because of a narrow planting strip, the vault or handhole shall be located entirely in the sidewalk with the edge flush with the street edge of the sidewalk and to the sidewalk grade. This applies only to the alternate location.

10.1.3 Location and Orientation for 577 Vaults with Junction Boxes

Additional clearances required for 577 vaults with junction boxes are shown in Figure 10.1.3.

These areas are to be kept clear and level to insure proper hotstick operation. See U2-14.2 for maximum allowable grade around hatch.
10.2 Secondary Handholes

The secondary handhole shall always be oriented with the length side of the handhole parallel to the curb. Lid shall open away from roadway.

10.2.1 Preferred Location

The preferred location is within the planting strip as shown in Figure 10.2.1.

Figure 10.2.1. Preferred Location for Secondary Handhole

10.2.2 Alternate Location

When there is lack of space in the planting strip, the alternate location for a secondary handhole is along the street side of the sidewalk, as shown in Figure 10.2.2.

Figure 10.2.2. Alternate Location for Secondary Handhole

Restore sidewalk per requirements in city of Seattle Standard Plans for Municipal Construction, Standard Plan No. 420 or other AHJ.
11. Sources

City of Seattle, Seattle Right-of-Way Improvement Manual

City of Seattle Standard Plan No. 030; “Standard Locations for Utilities (Residential Street)”

City of Seattle Standard Plan No. 285; “Pipe Bedding Sewer/Storm Drain”

City of Seattle Standard Plan No. 331; “Watermain Thrust Drain Blocking Horizontal Fittings”

City of Seattle Standard Plan No. 350; “Watermain Trench and Bedding”

City of Seattle Standard Spec 1-07.17(2), Utility Clearances

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Panomvana, Tanya; SCL Standards Engineer and originator of 0214.00 (tanya.panomvana@seattle.gov)

SCL Construction Guideline U2-10/NDK-50 (canceled); “Electrical Conduit and Facilities in Public Rights-of-Way”


SCL Construction Standard 0232.05 (canceled); “Underground Residential Equipment Location of 577 Vaults and Secondary Handholes”