

## Primary Underground: Transformer Pad Construction

Transformer pads may be constructed outside of buildings in appropriate applications. The following are general guidelines; the customer shall contact Seattle City Light well in advance of pad design in order to receive the specific requirements for the project.

### Transformer Pad Dimensions

SCL will determine the pad size based on the customer's total load and the type of devices used for the secondary connection to the customer's NEC-sized cables.

#### MINIMUM CLEARANCES:

##### FOR PADS NOT REQUIRING A FENCED ENCLOSURE, THE PAD MUST BE:

- 10 feet from any property line between private properties
- 10 feet from building doors or windows
- 10 feet from combustible structures
- 6 feet from noncombustible conductive (metal) structures
- 3 feet from noncombustible, conductive and combustible, nonconductive structures with a 3-hour fire protection rating
- 3 feet from any property line adjacent to the public right-of-way

##### FOR PADS REQUIRING A FENCED ENCLOSURE, THE PAD MUST BE:

- 10 feet from any property line between private properties.
- 10 feet from building doors or windows.
- 10 feet from combustible structures.
- 6 feet from noncombustible conductive (metal) structures.
- 3 feet from noncombustible, nonconductive structures and combustible nonconductive structures with a 3-hour fire protection rating

##### FOR THE FENCES OF THE ENCLOSED PADS, THE FENCE MUST BE:

- 6 feet from any property line
- 6 feet from noncombustible conductive (metal) structures
- 3 feet from noncombustible, nonconductive structures and combustible, nonconductive structures with a 3-hour fire protection rating

### Construction

- Prefabricated (from SCL approved manufacturer) or cast in place concrete
- Conduit locations in the pad must meet the requirements given in the applicable SCL Construction Guideline
- Foundations, footings, structures, tanks, piping, etc. are not allowed under the footprint of the pad

#### ACCESS

Provide unobstructed SCL vehicular (truck) access to the pad at all times for the installation and the servicing of electrical equipment.

## GUARD POSTS

- To protect the pad-mounted transformer from vehicles, install 4 inch x 8 foot rigid steel posts, inserted to a depth of 4 feet and filled with concrete, after the transformer is installed.
- Locate guard posts a minimum of 6 feet in front of transformer doors. (Transformer doors will be located on the conduit-cutout side of precast pads.) Locate guard post a minimum of 3 feet from the pad on the other three sides of the pad.

## Oil Containment

### Paved Apron

- A paved apron that is impervious to spilled oil shall surround the concrete transformer pad. The apron will extend a minimum of 3 feet from the pad edge.
- Gravel on bare soil for the apron area is not sufficient to meet the intent of the appropriate oil spill regulations unless soils data is provided by and stamped by a Professional Engineer registered in the State of Washington. This must certify that the soil is sufficiently impervious to prevent escape of oil from the containment system before cleanup occurs.

### Oil Containment System

An oil containment system includes: the concrete transformer pad, the paved apron, the surrounding curb, dike, berm or other appropriate barrier, and any oil/water collection and separation system. The intent of the oil containment system shall be to contain all spilled oil and oil-contaminated rainwater prior to cleanup. Since this containment system is subject to rain and snow accumulation, provision is required for handling water runoff.

The oil containment system shall conform to the current requirements of the Clean Water Act, Title 40 of the Code of Federal Regulations, Part 112 (see 40 CFR 112.7(c) as amended. For convenience, pertinent language from 40 CFR 112.7(c), current as of July 17, 2002 is quoted in part, as follows, or review the EPA website: <http://www.epa.gov/oilspill/>

“...The entire containment system...must be capable of containing oil...so that any discharge...will not escape...before cleanup occurs. At a minimum, you must use one of the following prevention systems or its equivalent:

- Dikes, berms, or retaining walls sufficiently impervious to contain oil
- Curbing
- Culverting, gutters, or other drainage systems
- Weirs, booms, or other barriers
- Retention ponds”

The criteria for regulations under 40 CFR 112 takes into consideration the potential for oil spill discharge into navigable waters. In the SCL service area, discharge to navigable waters would typically be of concern if there is potential discharge to storm drain systems.

Design, construction, operation and maintenance of oil containment systems shall be the responsibility of the property owner and includes:

- Appropriate provisions for oil and water run-off
- Separation of oil from water
- Periodic collection and proper disposal of oil and oil-contaminated water

## Spill Prevention, Control & Countermeasure (SPCC) Plans

For SCL-owned transformers located on private property, preparation of SPCC plans in conformance with 40 CFR 112 shall be the responsibility of the property owner.

## Pad Grounding

Foundations, footings, structures, tanks, piping, etc. are not allowed under the footprint of the grounding grid.

### FOR PADS NOT REQUIRING A FENCED ENCLOSURE:

Install four 5/8 inch x 8 foot copper-clad steel ground rods, set at the pad's corners, per the applicable SCL Construction Guideline [0652.03 "Transformer Pad Installation and Grounding 3  \$\Phi\$ , 7.5 - 30.0 KVA](#)

### FOR PADS INSIDE FENCED ENCLOSURES:

- Install four 5/8 inch x 8 foot copper-clad steel ground rods, set at the pad's corners, per the applicable SCL Construction Guideline [0652.03 "Transformer Pad Installation and Grounding 3  \$\Phi\$ , 7.5 - 30.0 KVA](#)
- All conductive parts of the enclosure's fence shall be tied to the pad's ground grid.
- The fence gate shall be grounded to the fence post with a flexible braided copper strap.
- Install ground rods and ground cable around the perimeter of the metal fence, 18 inches away from the fence, including out around the swing of the gate when opened, as instructed by SCL.

### THE FENCE SHALL BE:

- 6 feet from conductive (metal) structures.
- 3 feet from nonconductive structures.

## Service Termination Facility

### FOR PADS NOT REQUIRING A FENCED ENCLOSURE:

- If the customer has more than four (4) sets of NEC-sized service entrance cables, the customer may be required to install a service termination handhole for installation of multiple connectors. SCL will pull utility service cables from the transformer to the service termination handhole and terminate the service on the multiple connectors.
- SCL can terminate up to six (6) sets of NEC-sized cable on one set of multiple connectors. SCL may install two separate sets of multiple connectors in a large handhole, for a total of 12 sets of NEC-sized cable allowed to enter the handhole.
- If the customer has more than 12 sets of NEC-sized cable or if the cable size is greater than 750 kcmil, then the customer must install NEC-sized secondary bus bars, spaced and drilled per SCL Construction Guideline [U11-9.1 "Bus Extensions and Cable Tap Boxes"](#), in a service termination facility. SCL will pull utility service cables from the transformer to the service termination facility and terminate the service on the bus bars.

### THE SERVICE TERMINATION FACILITY MAY BE:

- An in-building vault on an exterior wall at the same grade as the pad.
- A stand-alone, pad-mounted, cable-to-busbar termination enclosure.

### FOR PADS REQUIRING A FENCED ENCLOSURE:

If the customer has more than six (6) sets of NEC-sized service entrance cables or the cable size is greater than 750 kcmil, then the customer must install NEC-sized secondary busbars. These will be spaced and drilled per SCL Construction Guideline [U11-9.1 "Bus Extensions and Cable Tap Boxes"](#) in a stand-alone, pad-mounted, cable-to-bus-bar termination enclosure located next to the fenced enclosure. The bus bars must extend over the fence into the enclosure at a height given in the above construction guideline.