

# Requirements for Customer-Owned Transformation

*For Pad-Mounted Transformers, Metal Enclosed Switchgear and Unit Substations*

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## General Information

1. All equipment must meet or exceed the requirements of the Ontario Electrical Safety Code
2. System supply voltage is **27600/16000V** or **13860/8000V** grounded.
3. The main disconnecting device shall be suitable for:
  - **500MVA** system with a minimum Basic Insulation Level of **95kV** at **13860/8000V**; or
  - **800MVA** system with a minimum Basic Insulation Level of **150kV** at **27600/16000V**
4. Incoming cable will terminate on the supply side of a gang operated load break disconnect switch, the load side of the switch will be connected to the over current protection.
5. The operational demarcation point will be the main disconnecting device at the customer's premises and must include provision for padlocking in the open or closed position. This switch will be under the control of Horizon Utilities Corporation, and the customer must provide unrestricted access to this switch
6. The ownership demarcation point shall be located at the supply terminals of the customers' main disconnecting device for overhead and underground and to be located no more than 30m from the property line for overhead.
7. Suitable surge protection must be installed to protect the transformer.
8. Secondary metering up to 3000A is allowed provided the customer owned transformer meets one of the following standards;
  - **CAN/CSA C802.1 – Minimum Efficiency Values for Liquid-Filled Distribution Transformers**
  - **CAN/CSA C802.3 - Maximum Losses for Power Transformers**
  - **CSA C802.2 – Minimum Efficiency Values for Dry-Type Distribution Transformers**
9. The customer must supply provision for Horizon Utilities Corporation installed metering and unrestricted access for meter reading. Detailed specifications to be provided upon request.
10. The transformer must be at least 6.0m away from combustible materials on buildings and from openings such as windows, vents and doors. However, if the transformer is equipped with a pressure relief device and protected by an internal current limiting fuse, the minimum distance of the transformer location can be reduced to 3.0m on the access side and 1.0m on all other sides, per Ontario Electrical Safety Code.
11. Transformation and ground grid, in its entirety, must be located on the customer's property.
12. Guard posts are recommended to adequately protect the transformer from vehicular damage if it is located within 2.0m of a driveway or parking area. Galvanized steel guard posts must be bonded to the transformer ground loop.

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13. Unit substations must be located in a suitably fenced enclosure. Pad-mounted transformers and outdoor metal enclosed switchgear must be tamperproof.

**The following must be submitted to Horizon Utilities Corporation:**

*The customer must obtain Horizon Utilities Corporation approval for the components that affect Horizon Utilities Corporation distribution system. The following must be submitted well in advance of tender documents being issued.*

Two (2) copies each of the following, certified by a registered Professional Engineer:

- Site Plan
- Single Line Diagram, including all electrical components and ratings
- Substation Layout, including fence details, working and live parts clearances, grounding details, interlocking schemes, property lines, and metering location.
- Coordination Study for protection review
- Transformer Drawing(s) and Specifications
- Switchgear Drawing(s) and Specifications
- All Electrical Safety Authority reports

For used or refurbished transformers:

- Transformer PCB and complete gas test

**Prior to Energization**

Horizon Utilities Corporation must complete a pre-service inspection consisting of:

- Verify built in accordance to design
  - Transformer nameplate ratings (ie. Primary Size, Voltage, Delta/Wye)
  - High voltage fuse sizing
  - Lightning arrester ratings
  - Proper access

Electrical Safety Authority's inspection clearance must be received directly from ESA.