

## Technical Guidelines for Electrical Services Over 400 Amperes (Former Kitchener-Wilmot Hydro Service Territory)

These guidelines are for property owners, developers, consultants, etc. (“**Customers**”) to use when coordinating a new or upgrade of electrical service (“**Service**”) to a property in the City of Kitchener or the Township of Wilmot. They are to be used in conjunction with the Conditions of Service for Enova Power Corp. (“Enova”) for the former Kitchener-Wilmot Hydro Inc. service territory, service connection process, the Ontario Building Code (“**OBC**”), the Ontario Electrical Safety Code (“**OESC**”), and other applicable regulations.

### 1. GENERAL

- 1.1 Contact Enova’s Victoria Street office – Service Design Section prior to starting design to review service requirements for the property. Conceptual site plan and basic load calculation needs to be provided to assist in determining service requirements.
- 1.2 Customer to follow Enova’s “Service Connection Process for Properties Requiring Site Plan Review” Document.
- 1.3 All materials, labour, and trucking costs associated with the installation, removal, etc., of Enova owned infrastructure for the purpose of servicing this property is 100% chargeable to the customer.
- 1.4 In most cases Enova will provide and own transformer(s), cables, and conductors. The customer will install Enova supplied transformers foundations, transformer rooms, and duct bank, as instructed by Enova Power. Refer to the Appendix of this document for general details.
- 1.5 Under certain conditions Enova may require a “looped” High Voltage service to supply multiple transformers. A looped service requires a High Voltage Switch. Enova Power will supply and install the High Voltage switch. Customer to the switch foundation, switch rooms, and / or all duct structure. See appendix for general details.

### 2. TYPICAL INFRASTRUCTURE REQUIRED

A typical electrical service may be comprised of any of the following:

- i) Underground high voltage duct structure from points of supply to the new service location.
- ii) Transformer room(s), Pad mounted transformer(s), Switch Room(s), and submersible switches.

- iii) A low voltage duct structure.
- iv) An electrical room(s) and metering room(s) in the building.

### **3. EASEMENT REQUIREMENTS**

Easements may be required for Enova owned high voltage infrastructure on private property. The easements are to be free of any structure, other underground utilities, tree roots, etc. The customer may be required to provide easement(s) per the following:

- i) 3.0m wide easement over an underground high-voltage duct bank;
- ii) 6.2m x 6.8m easement for the installation of a pad-mounted transformer;
- iii) 7.0m x 7.0m easement for the installation of a switchgear unit.

### **4. CLEARANCE REQUIREMENTS**

- 4.1 A building or any other structure shall not be constructed within 7.5 meters, measured horizontally from the center line, of an overhead distribution system pole line owned by Enova (OBC 3.1.19 and OESC 75-708). Permanent structures within the "restricted zone" surrounding overhead lines are prohibited. This restricted zone is defined by Enova standard DWG D11111. When planning to construct a building, customer is also required to provide the extra space required for construction (skyjacks, scaffolding, etc.) and maintenance (window cleaning, painting, etc.)
- 4.2 An object (crane, hoisting device, backhoe, power shovel, or other vehicle and equipment) shall not be brought closer than 3 meters to an energized overhead conductor owned by Enova Corporation (O.Reg 213/91 -Section 188).
- 4.3 Enova will not permit a third party contractor to cover up and or provide isolation of its energized overhead conductors that lie along a construction site (O.Reg 213/91 - Section 189).

### **5. SPACE REQUIREMENTS**

- 5.1 A minimum of 3 meters of clear space is required in front of pad mounted transformers, transformer room(s), submersible switch gear, and switch gear room(s). This area shall have a level surface (grass, concrete, or asphalt).
- 5.2 Pad mounted transformer foundation and underground switchgear vault foundation shall be a minimum of 3 meters away from a building or any other customer owned structure. This is to accommodate the ground grid installation and future operation/maintenance work.
- 5.3 A minimum of 1 meter square is required in front of Enova metering equipment. Meter rooms and electrical to have a minimum height of 2.1 meters.

- 5.4 When required by Enova, a transformer vault room / and high voltage switchgear room shall be provided by the customer for servicing. The transformer vault room and high voltage switchgear room shall be at grade level accessible from directly outside the building.
- 5.5 When required by Enova power, the customer shall provide Enova with a road that is a minimum 4.6m wide with a minimum 12m turning radius, clear of any obstructions and capable of sustaining a maximum load of 25,000 kg to access the transformer(s), switchgear unit(s) or vault room. Refer to Enova Standard DWG E6341 for access road detail. Any canopy or other parts of the building above the access driveway must be minimum 5.0 m above roadway. Any canopy or other parts of the building above the pad mounted transformer or switchgear vault, must be a minimum of 11 meters above these structures. An 8.5m wide space is required for truck outriggers at the transformer location. Furthermore, extra 2.5m is required between the transformer and the truck to accommodate minimum swing of the truck mounted crane.

## **6. ACCESS REQUIREMENTS**

- 6.1 The customer must provide or arrange free, safe and unobstructed access to any authorized representative of Enova corporation for the purpose of equipment maintenance, inspection, replacement.
- 6.2 The customer shall be responsible for supplying Enova corporation with a key to the premises if required to access equipment. Enova may request that the lock be keyed to Enova specifications.
- 6.3 Meter rooms, for multi-unit metering, shall be accessible to Enova personal via an outside door at grade level.

## **7. INSTALLATION DETAILS**

The customer shall provide the required infrastructure in a location compliant with this document and approved by Enova Power, installed as per the following standards:

- 7.1 Transformer Installations:  
Refer to Enova Standard DWG B10341 for transformer vault design and installation specifications;
- 7.2 Transformer Room Installations:  
Refer to Enova Standard DWG C5553, C5554 and C5555 for installation requirements.  
  
C5554 - Small transformer room -12'W x15'L x9'H – for room type transformer up to 500kVA

C5553 - Medium transformer room -15'W x 20'L x9'H – for room type transformer between 500kVA and 1000kVA

C5555 - Large transformer room - (20'W x 25'L x 9'H) for room type transformer larger than 1000kVA

7.3 Switchgear Vault Installations:

Refer to Enova Standard DWG C9095, B9098 and B9100 for Three phase underground switchgear vault design specification and installation requirement.

7.4 Switchgear Room Installations:

Refer to Enova Standard DWG C5604 for Three phase underground switchgear room design specification and installation requirement.

7.5 Duct bank Installations:

For underground distribution, refer to Enova Standard DWG B3727 for duct bank construction details.

For general underground primary service duct work, refer to Enova Standard DWG C5560 for duct formation details.

7.6 Metering Installations

For metering installation, refer to Enova Standard DWG E9925 and E9926 for installation requirements.

E9925: for 3 Ph transformer rated service metering with metering cabinet

E9926: for 3 Ph transformer rated service metering with LV switchgear

If the site is fed from a customer owned distribution transformer the customer must make provisions for bulk metering to accommodate a transformer discount meter.

**Appendices:**

C11111 – Clearances to adjacent structures 8.32kV -27.6kV

E6341 – Transformer room access road detail

C5604 – Typical switching room with Vista switch layout

C5554 – Typical small transformer room (12'W x15'L x9'H)

C5553 – Typical medium transformer room (15'W x 20'L x 9'H)

C5555 – Typical large transformer room (20'W x 25'L x 9'H)

B3727 – Duct bank construction details

- C5560 – General underground primary service duct formation details
- C10341– Three-phase pad-mount transformer foundation c/w entrance way design specifications
- C10342– Three-phase pad-mount transformer foundation c/w entrance way installation specifications
- C9095 – Three phase underground switchgear (S & C Vista type) vault precast concrete design specification
- B9098 – Steel hinged vault cover for three phase submersible switchgear (S & C Vista type) vault
- B9100 – Three Phase underground switchgear vault ground loop installation
- E9925 – Metering installation details -transformer rated for 3 Ph service without LV switchgear 120/208V or 347/600V
- E9926 – Metering installation details -transformer rated for 3 Ph service with LV switchgear 120/208V or 347/600V