



Underground Subdivision Specifications

For Developers, Builders and Contractors

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1.0 PURPOSE

The purpose of this document is to establish the guidelines for underground developments and redevelopments within Wellington North Power's service area.

2.0 SCOPE

This document applies to all subdivision developments and redevelopments within Wellington North Power's service area effective January 1, 2017.

3.0 INTRODUCTION

3.1 Assignment of Work

Wellington North Power has categorized the work required to complete a development into two categories, Contestable and Non-Contestable work. Contestable work is work that any party can perform. Non-Contestable work is work only Wellington North Power can perform.

3.1.1 Contestable Work

- All related civil construction.
- Supply and installation of duct.
- Supply and installation of pad mounted equipment vault (s).
- Supply and installation of ground grid (s).
- Supply and installation of primary & secondary conductor.

3.1.2 Non-Contestable Work

- Approval of development plans.
- Pole line work.
- Supply and installation of transformer (s).
- Primary & secondary conductor termination.
- Connection of ground grid to transformer chassis.
- Inspection of all contestable work.

3.2 Scope of Work

This work shall consist of the design, supply and installation of materials and equipment associated with underground primary and secondary electrical distribution in new developments.

It is the long-term practice of Wellington North Power to eventually have in place a predominantly underground electrical distribution system. While it may not be practical to require an underground distribution system within all land developments or redevelopments, this will be the general rule. All new developments shall be provided with an underground distribution system at the Owner's

expense or as per the costing determined by the Economic Evaluation as completed by Wellington North Power.

The electrical distribution system shall incorporate a loop feed primary distribution system that is terminated on separate dip or riser poles for both single and three phase loads to provide every transformer with an alternate supply. In order to avoid costly retrofits and to ensure a loop feed is maintained, wherever possible, sections of a development will be pre-built to accommodate future development.

There may be other situations outside of subdivision projects where this specification or parts thereof may be applicable. Wellington North Power reserves the right to determine applicability.

3.3 Right of Refusal

It is the Developer/Builder/Contractor's responsibility to follow this Specification. Wellington North Power reserves the right to refuse energization of any part of the electrical plant that does not conform to this Specification and shall assume no responsibility or liability whatsoever for the cost of rework, repairs, relocating, or delays in energizing the system as a result of nonconformance.

3.4 Inspection

Wellington North Power will assign an inspector to the project. The Inspector may, at their discretion, require that certain phases of the work only be done when they are present. The inspector will be available during normal working hours from Monday to Friday, 7:30 a.m. to 4:00 p.m. Wellington North Power must be notified at least two (2) working days in advance of any work being performed and must be kept informed of the progress of all electrical work. Please note that Wellington North Power's inspection process is separate from the inspection requirements of the Electrical Safety Authority.

4.0 DIVISION OF WORK

4.1 Responsibility of the Developer

The developer/contractor shall:

- 4.1.1 Enter into a Construction Agreement with Wellington North Power.
- 4.1.2 Be responsible for all costs to design the primary and secondary electrical systems.
- 4.1.3 Be responsible for any additional cost incurred by Wellington North Power to work on the electrical system at the request of the Developer. The Developer will not hold Wellington North Power responsible for any delays or associated cost.

- 4.1.4 Provide a completed *F2510 Subdivision Service Request Form*.
- 4.1.5 Provide preliminary electrical and site plan drawings with the *F2510 Subdivision Service Request Form*. Drawings shall show local pole locations, proposed transformer locations, proposed detailed trench profile, if applicable the proposed electrical room/metering location, proposed road right of way cross section and show how access to metering would be gained.
- 4.1.6 Provide Wellington North Power with detailed base civil drawings in PDF and AutoCAD format. Location of property bars to be identified on this drawing. A hardcopy of the proposed Registered Plan is to be submitted when available and two (2) copies of the executed Registered Plan are to be submitted once the plan is registered.
- 4.1.7 Provide Wellington North Power with a Registered Easement(s), as may be required for the efficient servicing of the development. Easements are to be identified and provided at no cost to Wellington North Power.
- 4.1.8 Participate in the execution of a non-disclosure agreement with Wellington North Power for the use of applicable standards and specifications provided by Wellington North Power.
- 4.1.9 Provide all builders working within the development, with a copy of the latest Wellington North Power Underground Specifications only after each builder has entered into a non-disclosure agreement similar in form and function and containing terms similar to those stated in the Wellington North Power non-disclosure agreement with the developer. Proof must be provided to Wellington North Power prior to the start of work.
- 4.1.10 Provide all civil work required to install the electrical system including but not limited to the following:
 - 4.1.10.1 Supply and install underground conduit. All road crossings to be concrete encased.
 - 4.1.10.2 Install underground marking tape along the trench as per applicable codes and specifications.
 - 4.1.10.3 Supply and install all switchgear and/or switching cubicles.
 - 4.1.10.4 Supply and install all pad mounted equipment vaults/foundations in accordance with this Specification.
 - 4.1.10.5 Install and connect ground grids in accordance with WNP specifications.

- 4.1.10.6 Excavate all trenches for both primary and secondary cable as required to service individual lots.
 - 4.1.11 Supply and install all primary and secondary cables as well as associated ductwork in accordance with this Specification.
 - 4.1.12 When identified by Wellington North Power, label all cables as per Wellington North Power specifications.
 - 4.1.13 Ensure the installation of all materials meet both Wellington North Power and Manufacturer's guidelines and conform to Ontario Regulation 22/04.
 - 4.1.14 Be responsible for obtaining all locates prior to the start of construction.
 - 4.1.15 Be responsible for obtaining all required permits or authorizations such as, but not limited to: environmental approvals, permits or certificates, land use permits, building permits and site plan approvals.
 - 4.1.16 Stake out the route of the trench, transformers, and vaults.
 - 4.1.17 Be responsible for determining the exact location of equipment and their elevation as accepted by Wellington North Power and be responsible for all costs to correct problem if proper cable depth or foundation height is not acceptable once final grade has been established.
 - 4.1.18 Provide Wellington North Power with as-built drawings, final construction costs and any other documentation required.
- 4.2 Responsibility of the Builder

The builder shall:

- 4.2.1 Contact Wellington North Power to request an engineering service layout in preparation for connection of a new service.
- 4.2.2 Enter into a non-disclosure agreement with the developer, similar in form and function and containing terms similar to those stated in the Wellington North Power non-disclosure agreement with the developer.

- 4.2.3 Excavate trenching for the secondary duct and associated conductors according to the requirements of this Specification to service individual customers.
 - 4.2.4 Supply all necessary 100mm (4") PVC Type DBII conduit and couple all duct sections beside the trench at finished grade. NOTE: Ducts are not to be placed in the trench until the trench is inspected and approved by Wellington North Power.
 - 4.2.5 Excavate by hand around the existing supply duct or secondary conductor at the property line.
 - 4.2.6 Supply and install the secondary cables through the builder-supplied 100mm (4") duct from the lot line to inside the meter base at the house at the builder's expense.
 - 4.2.7 Ensure all inspection requirements by the Electrical Safety Authority (ESA) have been met prior to contacting Wellington North Power for service connection.
 - 4.2.8 Be responsible for any additional costs associated with (and including any additional trips required for) the connection of an individual service if the service crew cannot make the connection during the first trip due to non-compliance with Wellington North Power Specifications.
 - 4.2.9 Be responsible for obtaining all locates prior to the start of construction.
 - 4.2.10 Supply and Install all material to both Wellington North Power and Manufacturer's guidelines and conform to Ontario Regulation 22/04.
- 4.3 Responsibility of Wellington North Power
- Wellington North Power will:
- 4.3.1 Review all engineering work associated with the design of the distribution electrical system to service the development.
 - 4.3.2 Provide the Developer with electrical design requirements, Standards and Specifications that can be used in the Developer's tender documents.
 - 4.3.3 Indicate approximate location of the required trenches, ducts, and concrete enclosures for the electrical utility drawings.
 - 4.3.4 Supply, at the Developer's cost, all material required for the Non-Contestable Work.

- 4.3.5 Perform continuity and identification tests on all primary voltage cables at the Developer's cost.
- 4.3.6 Perform all work required to extend or reconfigure pole line(s). Supply and install all pole line hardware.
- 4.3.7 Supply and install pad mount transformers.
- 4.3.8 Supply and install all primary and secondary cable terminations.
- 4.3.9 Connect the installed grounding grid conductors to the transformer chassis.
- 4.3.10 Progressively energize switchgear, switching cubicles and transformers upon completion of successful cable testing.
- 4.3.11 Schedule the inspection of the main trench and installation of Wellington North Power's electrical system located along the road allowance provided all deposits have been made by the Developer and with proper notification. The inspector to check the trench, duct construction, and backfill.
- 4.3.12 Will instruct the Builder to place the connected ducts in the trench from a point 1 meter (40") from the foundation of the house at the meter base location to the service stub at the property line.
- 4.3.13 Terminate the secondary conductors at the meter base and at the transformer, and set a meter at the builder's expense.
- 4.3.14 If required, visit the site and design a service layout and provide a copy of the layout to the builder subject to Wellington North Power's conditions of service.
- 4.3.15 At the Developer's or Builder's cost, schedule only one trip to inspect, install and connect individual services. An additional cost will be charged for a second trip, if the service crew cannot make the connection during the first trip. Other trips required, due to non-compliance with Wellington North Power Specifications will be charged based on an hourly rate.

5.0 AGREEMENTS

5.1 Residential Developments

Wellington North Power will provide an Offer to Connect to a Developer once the Developer has provided all of the required documentation and information. If the Offer to Connect is accepted by the Developer, Wellington North Power will create a subdivision agreement.

Developers shall enter into a subdivision agreement (“Construction Agreement Developer”) with Wellington North Power, which is registered, on title to the lands being developed. The agreement shall cover the design and installation of a complete underground electrical distribution system subject to Wellington North Power specifications and approval. The Developer will provide securities and servicing costs as per the agreement.

6.0 CONNECTION COSTS

In accordance with the Distribution System Code, the Developer/Builder/Contractor is responsible for a deposit and/or non-refundable capital contribution as determined by Wellington North Power.

The capital contribution will be used to cover the cost of expansion of the overall electrical distribution system necessitated by load growth due to new developments. These charges will cover pole line extensions to a development except as below.

The capital contribution will be paid directly to Wellington North Power prior to Wellington North Power beginning work.

Where a customer requires a service upgrade to an existing service, this service upgrade would be completed entirely at the cost of the customer.

The policies outlined above apply equally to the material and labour costs incurred by Wellington North Power due to the service upgrade to an existing customer.

7.0 ELECTRICAL DISTRIBUTION DESIGN REQUIREMENTS

The Developer is responsible to ensure that the design of the electrical distribution system complies with the most recent revision of the following documents:

- Ontario Regulation 22/04
- CSA-22.3 NO. x-xx – Underground Systems
- Utilities Standards Forum – Section 12 – Underground
- The requirements of the municipality (municipal standards) and road authority
- Conditions of Service For Wellington North Power Inc.

The “Issued For Construction” drawings will be sealed by a Professional Engineer and will have a 22/04 certificate (example below) also signed by a Professional Engineer affixed to every page.

CERTIFICATE OF APPROVAL	
THE INSTALLATION WORK COVERED BY THIS DOCUMENT MEETS SAFETY REQUIREMENTS OF SECTION 4 OF THE ONTARIO RAGULATION 22/04 - ELECTRICAL DISTRUBUTION SAFETY (ELECTRICITY ACT, 1998)	
NAME _____	DATE _____
SIGNATURE AND PROFESSIONAL DESIGNATION _____	

Wellington North Power will provide a copy of the above Ontario Regulation 22/04, Utilities Standards Forum Section 12 upon request. The Developer is required to sign an Agreement Regarding Confidential Information prior to receiving the complete Utilities Standard Forum – Section 12 documentation.

The electrical distribution system shall be installed in accordance with the latest Township of Wellington North or Grey County Standard road cross-sections. Developers are required to contact the Municipal Road Authority to obtain the Typical Road Right of Way Cross Section. For Private Roads, the Developer is required to provide Wellington North Power with the proposed Road Right of Way Cross Section.

Generally in a subdivision, underground cable is installed in a joint-use trench shared with Bell (Alliant) Canada, Eastlink, and/or Wightman Telecom. The Developer is responsible for providing the underground duct bank detail. Samples of joint-use trench cross sections are detailed in section 12 of USF’s Construction Standards. Road crossings and other concrete encased duct banks are to follow Ontario Provincial Standard Drawing OPSD-2100.06.

7.1 Electrical Distribution System Characteristics in the Town of Arthur

The Town of Arthur is serviced with the following Primary System Voltages:

- 2,400/4,160 Volts 3 Phase 4 Wire
- 44,000 Volts 3 Phase 3 Wire

Developers/Contractors are responsible to contact Wellington North Power to determine the Primary System Voltage available in the area of a specific development.

7.2 Electrical Distribution System Characteristics in the Town of Mount Forest

The Town of Mount Forest is serviced with the following Primary System Voltages:

- 2,400/4,160 Volts 3 Phase 4 Wire
- 44,000 Volts 3 Phase 3 Wire

Developers/Contractors are responsible to contact Wellington North Power to determine the Primary System Voltage available in the area of a specific development.

7.3 Electrical Distribution System Characteristics in the Village of Holstein

The Village of Holstein is serviced with the following Primary System Voltages:

- 4,800/8,300 Volts 3 Phase 4 Wire

Developers/Contractors are responsible to contact Wellington North Power to determine the Primary System Voltage available in the area of a specific development.

8.0 Wellington North Power Installed Equipment

Wellington North Power will supply and install the following items

8.1 Pole Line Hardware

All material required to extend or reconfigure the pole line will be supplied and installed by Wellington North Power.

8.2 Terminations

All primary and secondary terminations will be supplied and installed by Wellington North Power.

8.3 Transformers

Wellington North Power supplies and installs the transformers for each development. The developer is responsible for all other material and labour associated with the installation of the transformers. The table below outlines the maximum capacity of a pad mounted transformer maintained by Wellington North Power, this is dependent on the primary and secondary voltage characteristics:

Secondary Voltage	Primary Voltage	
	2,400/4,160V	4,800/8,300V
120/240V 1 Phase 3 Wire	100 kVA	100 kVA
120/208V 3 Phase 4 Wire	500 kVA	500 kVA
347/600V 3 Phase 4 Wire	500 kVA	500 kVA

Transformer installations larger than the above stated capacity shall be supplied, installed and maintained by the Owner.

Contact Wellington North Power for additional three phase transformer and servicing requirements.

9.0 DEVELOPER INSTALLED EQUIPMENT

Other than the items listed in section 8, the developer is responsible for all other material, equipment, labor and cost for the development. The Developer is also responsible to ensure all equipment is listed in the Wellington North Power *Approved Material Specifications for Underground Construction*. Furthermore, the Certified Test Reports, Certificates of Compliance and shop drawings for primary cable, secondary cable, concrete vaults, and switchgears must be submitted to Wellington North Power for approval prior to installation.

9.1 Pre-Cast Pad Mounted Vaults

The proposed location of pad mounted equipment shall:

- Follow the layout as per the Township of Wellington North or Grey County Standard road cross-sections.
- Have a minimum clearance of 1.0m from edge of transformer to the edge of driveway, 0.5m from edge of transformer to sidewalk and 3.0m from any deep service or fire hydrant.
- Transformers will be located parallel to roadway in such a manner that the door opens opposite oncoming traffic flow.
- Avoid being located on the same side of the road as the municipal water main and pedestrian sidewalk, if possible.

The pad mounted equipment shall be installed:

- On a precast concrete foundation as per section 12 of USF's Construction Standards.
- With the grounding as per section 12 of USF's Construction Standards.

Refer to Wellington North Power's *Approved Material Specifications for Underground Construction* for more information.

9.2 Primary Cable

Wellington North Power shall be:

- 1/0 AWG, Copper conductor, 90°C, 15kV, XLPE, LLDPE with 100% concentric neutral underground cable in 100mm (4") type II duct with one spare for distribution.

Refer to Wellington North Power's *Approved Material Specifications for Underground Construction* for more information.

9.3 Secondary Cable

Each lot shall have a single service that runs along the lot line opposite the water/sewer service corridor. The secondary cable for each service shall be stubbed up in the service lateral trench on a 2" x 4" x 8' wooden stake with electric tape from top to bottom of stake. The secondary cable ends shall be taped with rubber (SAP) tape to ensure that moisture does not degrade the aluminum conductor. The secondary cable shall be spliced only as required with the appropriate underground sleeves and heat shrink for protection.

The secondary cable shall be installed in 100mm (4") DB2 duct from property line to house with a 90° sweep at the base of the meter base. The direct buried cable in duct shall rest on a 0.15m (6") bed of sand and be covered with an additional 0.15m (6") of sand.

Secondary cable shall be:

- 3/C, 3/0 AWG, Compact Aluminum, XLPE, 600V, USEI-90 Underground Triplex for service lengths up to 100m

Refer to Wellington North Power's *Approved Material Specifications for Underground Construction* for more information.

9.4 Switching Cubicles

Switching cubicles shall be:

- Switchgear, 15kV, Pad Mounted, Dead Front, Three Phase, 200 Amp, 3 Way

The switching cubicle shall be installed:

- On a concrete foundation as per section 12 of USF's Construction Standards
- With the grounding as per section 12 of USF's Construction Standards

Refer to Wellington North Power's *Approved Material Specifications for Underground Construction* for more information.

9.5 Metering

The Developer/Builder is responsible to supply, install and maintain a socket type meter base that meets the requirements of the Ontario Electrical Safety Code and Wellington North Power. The meter base shall be directly accessible to Wellington North Power staff and located on the exterior of the building, 3m from the front of the building and 1.70m above finished grade.

The meter base for underground services must be the “oversized” or “jumbo” style 200 A meter base.

Refer to Wellington North Power’s *Servicing and Metering Specifications* and the *Conditions of Service* for more information.

9.6 Street Lighting

Street Lighting requirements are determined by the municipality and road authority. The Developer is required to contact the municipality directly for all street lighting specifications, requirements and approvals.

10.0 CONTACT INFORMATION

Wellington North Power Limited
290 Queen Street W
Mount Forest, ON, N0G 2L0
(519) 323-1710