UFCSD Safety Codes
Permits & Inspections -
Electrical Discipline

Installation Guide for
New Residential Utility
Service 2020

Effective Date: November 5, 2020
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EXECUTIVE SUMMARY

To enhance customer service and ensure safe and quality installations of utility services, the City of Edmonton has collaborated with CHBA, ATCO, EPCOR, the Inspections Group and Edmonton-based Underground Contractors to produce a standardized installation guide. The pilot was created to address observed long-term trends across previous utility installations.

The Effective date of Installation of utility services for New Single Family Homes, Semi-detached, and Row Housing is November 5th, 2020.

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INSTALLATION GUIDELINES

1: Identification of Finished Grade

Finished Grade shall be identified where the services leave the building. A minimum of four grade markings at the electrical and gas utilities are required: at the front and back corners, and at each riser.

2: Gas and Electrical Riser Location & Dimensions

For single-family dwellings, the gas riser shall be installed closest to the street-side at no less than 0.30 m and no more than 2.50 m from the front corner of either the house or front attached garage, whichever is closest to the street. The front corner of the home shall be the reference point for single-family dwellings (zero lot line properties) and multi-family homes (semi-detached housing). The electrical riser will be installed furthest away from the street.

The placement and method of gas line installation will be determined at ATCO's discretion.

3: Water and Vent Clearance

ATCO: No vents or sources of water shall be installed within 1.20 m on either side (horizontal, not diagonal displacement) from the centre gas riser, including above the meter set. This allows for ATCO's minimum clearance requirements (of 1.00m) to be met in all scenarios. For further information, contact ATCO for clearance requirements.

EPCOR: The builder should avoid the installation of appliance exhaust vents (furnace, hot water tanks, etc.) within 1.20 m on either side (horizontal, not diagonal displacement) from the centre of the electrical meter. If 1.20 m cannot be achieved, the vent shall then be extended to 300mm above and directed away from the meter.

4: Gas and Electrical Service Separation
Gas and Electrical service will run in the same trench with minimum 300 mm separation from electrical in the horizontal (staked) plane, terminating as required at the municipal connection and at the consumer meter locations respectively.

Where the gas crosses the electrical service at the gas riser, 300mm of separation shall be maintained by using a minimum of three filled sandbags between the gas and electrical. These materials will be left by the builder/excavator.

5: Electrical Conduit Depth and Anchoring

**Primary Method:** The electrical conduit shall be in 63 mm rigid PVC conduit from the meter, and run directly against the foundation wall and on top of the footing.

Unique situations will be reviewed and will require approval prior to installation.

The conduit shall run along the foundation wall and be secured to the building with rigid two-hole 63mm steel straps secured to the foundation until it reaches the street side end of the building. If the conduit is on top of the footing, then the use of a one-hole strap will be permitted. The anchoring method for the straps shall be 6.4 mm minimum anchor bolts to ensure that the conduit is securely held in place during and after backfilling, compaction, and settlement. Power actuated fasteners are not approved for this installation. If you are using tapcon or similar type screws, they must be a minimum of 1.5 inches in length.

There shall be 1 two-hole rigid steel strap on the vertical below the bell fitting on the 90° bend and 1 one-hole rigid steel strap on the horizontal just after the 90° bend.

There must be 1 one-hole rigid steel strap within 150 mm of the corner of the building foundation and every 3.00 m on the horizontal between these 2 straps. The inside diameter of the service conduit sleeve shall be 100 mm and 600 mm long with 300 mm above grade and 300 mm below grade.
With ICF foundations, use longer anchor bolts along both the vertical and the horizontal.

**Secondary Method: If primary method is not possible**

**Secondary Method:** To be used if the Primary Method is not possible.

The electrical conduit shall be in 63 mm rigid PVC conduit from the meter, and run at a minimum depth of 1.30 m from the top of conduit to finished grade. The electrical conduit may run on the top of the footing provided that it is no less than 1.00 m to finished grade.

The conduit shall run along the foundation and be secured to the building with rigid two-hole 63mm steel straps secured to the foundation until it reaches the street side end of the building. If the conduit is on top of the footing, then the use of a one-hole strap will be permitted. The anchoring method for the straps shall be 6.4 mm minimum anchor bolts to ensure that the conduit is securely held in place during and after backfilling, compaction, and settlement. Power actuated fasteners are not approved for this installation.

There shall be 1 two-hole rigid steel strap on the vertical below the bell fitting on the 90° bend and 1 two-hole rigid steel strap on the horizontal just after the 90° bend.

There must be 1 two-hole rigid steel strap within 150 mm of the corner of the building foundation and every 1.00 m on the horizontal between these 2 straps. The inside diameter of the service conduit sleeve shall be 100 mm and 600 mm long with 300 mm above grade and 300 mm below grade.

With ICF foundations, use longer anchor bolts along both the vertical and the horizontal.

**6: Trench Requirement**

The trench will be brought to the level of the rigid PVC pipe after the PVC pipe leaves the building. No sand will be required for the electrical installation, but the marking tape is required midway between the conduit and finished grade. The marking tape shall remain visible at the electrical riser and the municipal connections upon service inspection.
The trench must be free of any construction debris prior to backfill with safe access in the trench that meets OHS requirements.

If using the secondary method: Place 300 mm of suitable fill at the edge of the building (300 mm high x 900 mm to foundation edge x 900 mm beyond foundation edge) across the full width of the trench. Soft sand shall be placed at the gas mark and bell-hole location.

7: Extension of Electrical Conduit from Foundation

From the street-side point where the electrical service leaves the foundation, continue with rigid PVC pipe. Bends in the duct due to piles or other barriers are acceptable, but only if they are required. The duct shall terminate at 1.50 m to 3.00 m from the main gas line, while maintaining a maximum of 2-90° bends or a total of 180°.

No additional strapping is required after it leaves the foundation wall. The ducting will be allowed to cross under the driveway if required, but shall not end underneath the driveway. There shall be no cable splices in the conduit. If there is a fault, a new cable shall be pulled in. The conduit shall have a bell collar on rigid PVC pipe and be sealed at the supply end with duct seal and covered with 300 mm of sand with the location staked. The service conduit sleeve shall have an inside diameter of 100 mm and 600 mm long with 300 mm above finished grade and 300 mm below finished grade.

8: Meter Base and Cable Termination

Epor will terminate the underground cable in the meter base, with 450 mm of extra cable left above the top of the meter box that shall be coiled up inside the meter box. The meter base shall be 200 A as per the EPCOR Customer Connection Guide (400 mm x 280 mm x 100mm). A correctly sized mast clamp will be required below the meter base.

A 100 A meter combo disconnect will be allowed for 100 A services.
9: Site Inspections

These installations require site inspection after the electrical is completed for the electrical conduit only. Backfill shall not be completed prior to a successful electrical inspection (receipt of green sticker). Atco will be responsible to provide stakes and sand bags for separation between gas and electrical.
Installation Guide for Residential New Services

PVC conduct to extend to within 1.20 m—2.0 m of the main gas line with bell ends covered with 300 mm of sand.

No vents or other sources of water installed horizontally within 1.20 m of gas riser.

PVC conduct to extend to within 1.20 m—2.0 m of the main gas line with bell ends covered with 300 mm of sand.

The gas meter shall be installed closest to street side 0.30 m ± 250 mm from the front corner of the house or front attached garage, whichever is closest (See Section 3).

Center of Electrical meter to finished grade must be 1500mm-1800mm.

Maximum of 1.20 m from the top of conduct to Finished Grade.

FINISHED GRADE

Electrical

Gas

No vents or other sources of water installed horizontally within 1.20 m of gas riser.

300 mm of suitable fill at the edge of the building (500 mm high x 500 mm to foundation edge) x 500 mm beyond foundation edge.

Size of box: 200 A, 400 mm (H) x 360 mm (W)

Must Clamp

Revised August 20, 2019
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Additional Information: Sample Installations

**Installation 1**
- **House**
- **Electrical**
- **Garage**
- **Gas**

Where the conduit meets the wall of the garage, it will be stripped to the garage or only to the wing wall.

**Installation 2**
- **House**
- **Electrical**
- **Wing Wall**
- **Garage**
- **Gas**

Incorrect Installation: Adding a 45° bend to run the conduit stripped to the wall of the garage.

**Installation 3**
- **House**
- **Electrical**
- **Wing Wall**
- **Garage**
- **Gas**

Alternate Wing Wall Installation: A sleeve through the wing wall is permitted.
SAMPLE INSTALLATIONS: PRIMARY METHOD
SAMPLE INSTALLATIONS: SECONDARY METHOD

Figure 1| The conduit is correctly backfilled as it leaves the foundation
Figure 2| Top view of conduit from trench

Figure 3| Rainwater leads must go around the electrical conduit

Figure 4| Typical installation
Figure 5| Additional view of unembedded installation using planks

Figure 6| Unembedded installation using planks
**NEW UNDERGROUND SERVICE INSTALLATION**

*Quick Reference*

1. **Finished grade** is clearly identified by builder on foundation wall where the services leave the building. A minimum of 4 grade markings at the electrical and gas utilities are required, at the front and back and at each riser.

2. Gas Riser will be installed closest to street side 0.30 m ≥ 2.50 m from the front corner of the house or front attached garage (whichever is closest)
   - Electrical riser installed furthest away from the street.
   - Electrical conduit installed closest to foundation throughout run.
   - Crossover with gas line occurs at the edge of the building.

3. No vents or sources of water within 1.20 m on either side of gas riser and above meter (horizontally, not diagonally).

4. Gas and electrical is run in the same trench with a minimum of 300 mm separation from electrical.

5. Electrical installed in 63 mm rigid PVC conduit at 1300 mm minimum from the top of the conduit to finished grade.
   - Conduit runs along foundation until it reaches street side at the end of the building or garage and is secured to the foundation with rigid two-hole straps.
   - 1 two-hole 63mm rigid steel strap on the vertical below the bell fitting on the 90° bend.
   - 1 two-hole 63mm rigid steel strap horizontal just after the 90° bend.
   - 1 two-hole 63mm rigid strap every 1000 mm on the horizontal between these 2 straps and 1 two-hole 63mm rigid steel strap within 150 mm of corner of the building foundation.
   - The service conduit sleeve shall be inside diameter of 100 mm (4”) and 600mm long with 300mm above grade and 300mm below grade.
   - IFC foundations must use 20 mm (3/4”) pressure treated plywood secured with longer anchor bolts.

6. Backfill brought to the level of the rigid PVC.
   - No sand will be required for the electrical installation, but marking tape is required midway between conduit and finished grade.
   - Marking tape visible at electrical riser and municipal connections.
   - 300mm of suitable fill shall be placed over electrical at the edge of the building (300 mm high x 900 mm to foundation edge x 900 mm beyond foundation edge).
   - Soft sand shall be placed at the gas.

7. Continue with rigid PVC from street-side point where electrical service leaves the foundation, terminate 1.50 m ≥ 2.00 m from the main gas line.
   - Conduit requires a bell collar on rigid PVC sealed at the supply end with duct seal and covered in 300 mm of sand.
   - Service Conduit sleeve inside diameter is 100 mm, lengthened to 600 mm.
   - Conduit is 300 mm above finished grade and 300 mm below finished grade.

8. 450 mm of extra cable left above the top of the meter box coiled inside.
   - Meter base is 200 A, Size of box: 400mm (H) x 280mm (W) x 100mm (D)
   - All installations must be run with 63 mm conduit.
   - Mast clamp is required below the meter base.

9. Site inspections after electrical is completed and are for the electrical conduit only.
   - Backfill is completed after electrical inspection has received a green sticker.
   - Placement and method of gas line installation is up to ATCO’s discretion.
   - Conduit shall not terminate beneath a driveway or a sidewalk or have any splices in the conduit.