



Inspection Services

CITY OF GRANDE PRAIRIE

**HOMEOWNER'S PERMITS
AND WIRING GUIDE FOR
ELECTRICAL INSTALLATIONS**

2016

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APPLICATION FOR HOMEOWNER PERMITS

This document is only a guide.

It describes methods of installation that have been tried and tested and which have been successful over a number of years.

Other methods of wiring a home can be used but the installation must meet the requirements of the Canadian Electric Code - 2015, 23rd Edition.

Who's Eligible to Apply for an Electrical Homeowners Permit?

The owner of a single-family dwelling who:

- Lives in the house, and owns the property, and
- Will do the wiring himself or herself.

**** Due to the hazards involved, homeowners who are not certified electricians cannot install the pool grounding and connecting the electrical equipment for permanently installed swimming pools *****

Homeowners need a basic knowledge of electric wiring.

The Electrical Inspection Division strongly recommends that Homeowners without a basic knowledge of electric wiring should hire a qualified electrical contractor; who is then responsible for obtaining the permit.

For Hot Tub, Spas, etc., they also STRONGLY recommend that Homeowners seek professional advice before attempting these installations due to the complex varying circumstances.

1. Permit Application Requirements

- As noted above, to obtain a Homeowners Electrical Permit, you must own AND reside in the house the permit is being requested for.
- A completed 'residential Building (Subtrade) Permit Application. This form can be found online at cityofgp.com.
- A complete electrical plan indicating:
 - Panel
 - Plugs
 - Switches
 - Light Locations
 - Number of Circuits Required

- If you are living in Row Housing (separate entrances and separate services); a letter from the condo Board is required as part of your application.
- A Homeowners Electrical Permit will not be issued for apartment style condos (common hallways and heating systems).

2. When Permits Cannot Be Issued

Homeowner Electric Permits cannot be issued if:

- Proof of ownership of the house is not presented; or
- The home will be used for rental purposes.
- The wiring has been concealed (walls drywalled).

3. When Permits Can Be Cancelled

The homeowner will then be responsible to hire a qualified licensed electrical contractor to complete the electrical installation and the electrical contractor will obtain a separate electrical permit to do the work.

4. Permit Expiry Conditions

If work within the scope of this permit has not commenced within 90 days of the date of issue, or if the work is suspended or abandoned for a period of 120 days prior to completion, the permit may be expired.

No further work is to commence unless you have first obtained a new permit. Should you require a time extension for this permit, you must make written application to Building Regulations prior to permit expiry.

Additional inspection fees will be charged, in accordance with the Electrical Installation and Inspection Bylaw, and billed to the permit holder. The permit fee is non-refundable and entitles the permit holder to two inspections only.

5. Requesting Inspections

- There are typically 2 inspections required, Rough Wire, & Final Installation.
 - Rough in inspection must be performed before covering with insulation or drywall (open studs) on a homeowners permit.
 - Final inspection is required once all outlets, switch devices and light fixtures are in place and energized.
- How to request an inspection:
 - Email: inspections@cityofgp.com
 - Phone: 780.538.0421 between 8:30 AM and 4:30 PM to make your inspection request.
 - Call/Email for inspection at least two working day in advance.
 - Arrange for access to the premises for the Safety Codes Officer.
 - Occupied homes require the presence of the owner or their representative of 18 years and older during inspections.
- Our offices are open Monday to Friday with all statutory holidays excluded.
- Appointments or specific times are not possible.
- The number and kinds of inspection vary according to the work you are doing but may include the following:

6. Underground Inspection

- Call for this inspection once the underground installation is complete.
- Do **not** backfill until the Safety Codes Officer (Electrical Inspector) has accepted the installation.
- **FOR GARAGES**, please coordinate the underground and rough wiring inspections if possible.
- Electrical wiring in the trench is required to be buried to a min depth of 18".

7. Rough Wiring Inspection

This inspection requires:

- All electrical boxes to be secured in place, flush with the finished wall or ceiling.
- All wiring to be installed in the electrical boxes and secured to the building structure (see diagrams).
- All grounding conductors to be terminated in electrical boxes and splices completed (see diagrams).
- All recessed lighting fixtures (unless fixtures are "retrofit" type) shall be installed and wiring terminated in fixture junction boxes.

Please note: Do not secure plugs, switches, and lights to outlet boxes on first inspection. If you wish to terminate the devices and surface mount light fixtures to the wires for this inspection, do not fasten to the electrical boxes. For heavy or large light fixtures that require additional support, please leave off until the final inspection.

- Do not install insulation or vapor barrier (if it is required) until the Electrical Inspector has accepted the installation.
- Wiring may be installed in the panel (turn the main breaker off before removing the panel-board cover). Ensure the cables installed are isolated from the energized equipment inside the panel board and the covers are re-installed **BEFORE** turning the main breaker back on.

8. Deficiencies

The deficiencies noted by the Electrical Safety Codes Officer need to be corrected **AND** re-inspected prior to the construction project proceeding (unless instructions are otherwise given by the Electrical Safety Codes Officer) .

9. Final Inspection

- **CAUTION:** Before entering the electrical panel be sure the main switch is **OFF**.
- All devices should be connected and secured to outlet boxes.
- All branch circuits should be installed in the panel and terminated on the circuit breakers.

10. Cautionary Notes

- When developing the basement or renovating existing areas, do not design the development so that panel boards are placed in clothes closets, bathrooms, stairways or any other area where moisture or location may present a hazard. (These areas are not acceptable and may result in the electrical contractor relocating the panel board under a separate permit.)
- Ensure that a minimum 1 m (39 inches) clearance is maintained from the face of the panel board.
- Ensure that circuits are not left in an energized state during construction when children or persons requiring constant care are present unless all light fixtures, devices and cover plates have been installed.

11. General Rules for Non-Metallic Sheathed Cables

- Use only copper conductors.
- Use 14 AWG copper wire for general purpose wiring (lights and receptacles).
- Provide over-current protection of 15 amperes for general purpose wiring (lights and receptacles).

- Install a maximum of 12 outlets on a general purpose circuit (lights and receptacles).
- Run cable as a loop system in continuous lengths between outlet boxes, junction boxes and panel boxes. Make joints, splices and taps in the outlet boxes.
- Where cables pass through a hole in a joist or stud, bore the hole 32 mm (1.25 inches) back from the face of the stud or joist or protect the wires from driven nails by using metal plates.
- Secure wires every 1.5 m (five feet) when run on the sides of joists or studs and 300 mm (12 inches) from each outlet box.
- Protect wires that are exposed within 1.5 m (five feet) of the floor.
- Keep cables a minimum of 25 mm (one inch) from heating ducts.
- Where cables run through or along metallic studs, joists, sheathing or cladding, ensure that the cables are:
 - protected from mechanical damage both during and after installation
 - protected by an insulation insert secured to the opening in the stud, and
- Protect cables from mechanical damage and from driven nails and screws when they are installed behind baseboards or horizontally behind cupboards
- Where communication cables are to be installed in joists or studs, maintain a minimum separation of 50 mm (two inches) from any power non-metallic sheathed cable.

12. Outlet Boxes

- Set outlet boxes flush with the finished wall or ceiling and secure them to studs or joists.
- Ground all outlet boxes. (See diagram on page 12)
- Ensure all junction boxes are accessible after installation.
- Leave at least 150 mm (6 inches) of wire out of each outlet box for joints and connection of equipment.
- Surround the outlet boxes with a moisture resistant barrier when the wall or ceiling requires a vapor barrier.

13. Light Fixtures

- Install 3-way switches according to diagram on page 13.
- Light Fixtures that are installed in closets shall be totally enclosed.

The maximum number of conductors permitted in outlet boxes are:

Common Metal Box	Dimensions	Capacity ml (cu-in)	#14	General Usage
Octagonal	4 x 1 1/2	245 (15)	8	light or junction
Square	4 x 1 1/2	344 (21)	12	junction
Rectangular	3 x 2 x 1 1/2	131 (8)	3	switch or plug
	3 x 2 x 2	163 (10)	4	switch or plug
	3 x 2 x 2 1/2	204 (12.5)	5	switch or plug
	3 x 2 x 3	245 (15)	7	switch or plug

Note: When a dimmer switch, a timer, or a GFCI receptacle is used in an outlet box, reduce the number of permitted conductors by three.

- Three-way switching is required on stairway lighting when a stairway has four or more risers AND is leading to a finished area or to an outside entrance. Refer to page 13 for a simple three-way switching wiring diagram.
- Switches cannot be located within 500 mm from bathtub or shower. Switches located within 1 m of a bathtub or shower shall be protected by a ground circuit interrupter of the class A type.

14. Smoke Alarms and Carbon Monoxide Alarms

- Smoke alarm is required in each bedroom c/w interconnection to all other smoke & smoke combination smoke carbon monoxide alarms in the dwelling.
- Install smoke combination carbon monoxide (CO) alarms on each floor level, including basements.
- Install smoke combination carbon monoxide (CO) alarms within 5m (16') of bedrooms.
- Smoke combination carbon monoxide (CO) alarms are to be powered from a branch circuit containing lighting.
- Smoke alarms and carbon monoxide alarms **are not to be installed** on a circuit protected by a Ground Fault Circuit Interrupter or Arc Fault Circuit Interrupter.
- When more than one smoke detector is being installed, interconnect the smoke detectors with 14/3 NMD-90 cable and connect according to manufacturer's instructions.

***Note:** The Alberta Building Code permits only wired-in smoke and carbon monoxide alarms. (Alberta Building Code – Article 9.10.18.3).*

***Note:** Smoke Detectors and/or Alarms installed, monitored by third party security Alarm Company's **DO NOT** replace the required line voltage smoke, smoke combination CO detectors required by Alberta Building Code.*

15. Garages

- Install the underground wiring to a garage according to the Table and Sketch on page 11.
- Provide at least one separate circuit to the garage and one duplex receptacle for each car space. The lighting may come off this circuit.
- One receptacle shall be provided for each garage door opener and be located within 1 m (39 inches) of the opener.
- Using the same trench for gas sub-service lines and electrical power conductors is permitted.

16. Receptacles

All circuits for plug receptacles only at 15 and 20 amp; in a single family dwelling or part of a dwelling unit is required to be Ark Fault Protected (AFCI). This also includes attached garages, enclosed decks and sunrooms.

Except for the following below:

- Kitchen counter, and/or peninsula, and/or island plugs. (2 duplex receptacles per circuit)
- Refrigerator plug (1 receptacle or 1 separate circuit)
- Sump plugs (1 receptacle or 1 separate circuit)
- Bathroom ground faulted plugs (all plug receptacles only on a separate circuit)

Note the following:

- General lighting c/w smoke & smoke combination CO detectors, central furnace, central air conditioners, hot tubs does not require to be ark fault protected.
- Ark fault plug receptacles may be used in place of ark fault circuit breakers; if the branch circuit cable supplying up to the first plug on the circuit is an ark fault receptacle. The branch circuit supply cable shall consist of metal raceway (conduit), or armored cable or non-metallic raceway (conduit).

17. Receptacles (General)

- Install duplex receptacles in the walls of every finished room or area so that no point along the floor line of any usable wall space is more than 1.8 m (6 feet) horizontally from a receptacle. The usable wall space includes a wall space of 900 mm (3 feet) or more in width but doesn't include doorways, windows that extend to the floor, fireplaces or other permanent installations that would limit the use of the wall space.
- Ground all receptacles (See sketches).
- Connect the receptacles so that the silver terminal screw (or the screw identified as "white") on the receptacle is connected to the white circuit wire; the brass terminal screw (or the screw identified as "black" or "hot") on the receptacle is connected to the black (or red) circuit wire.
- Connect only one wire under each terminal screw. Do not use the terminal screws and the "quick connect".
- Receptacles shall be of the **tamper resistant** type (except receptacles dedicated to stationary appliances (e.g. microwaves, washing machines) or receptacles located above 2 m from the floor.

18. Kitchen Receptacles

- Provide a sufficient number of receptacles (15A split or 20A T-slot) along the wall behind counter work surfaces (excluding sinks, built-in equipment, and isolated work surfaces less than 300 mm long at the wall line) so that no point along the wall line is more than 900 mm from a receptacle measured horizontally along the wall line.
- Receptacles within 1.5m of sinks (wash basins complete with drain pipe shall be protected by a ground fault circuit interrupter.
- Provide at least one receptacle (15A split or 20A T-slot) installed at each permanently fixed island counter space with a dimension of 600 mm or greater and a short dimension of 300 mm or greater.
- Provide at least one receptacle (15A split or 20A T-slot) installed at each peninsula counter space with a long dimension of 600 mm or greater and a short dimension of 300 mm or greater.
- Refrigerators, dishwashers and microwave ovens require separate circuits.

19. Reasons for Tamper Resistant Receptacles

- There are a significant number of electrical shock incidents that occur when children insert conductive objects into electrical receptacles. Most of these incidents take place in living areas of the home. Tamper resistant receptacles are designed to prevent contact with live electrical contacts when an object, other than a plug, is inserted into one of the receptacle slots.

20. Electric Dryer

- Provide a 30 Amp circuit breaker with a 2-pole common trip.
- Use #10 copper wire (NMD-90).
- Use a 30 Amp receptacle rated 125/250 volt (14-30 R).

21. Electric Range

- Provide a 40 Amp circuit breaker with a 2 pole common trip.
- Use #8 copper wire (NMD-90).
- Use a 50 Amp receptacle rated 125/250 volt (14-50 R).

22. Laundry Room or Area

- Install a separate circuit and include at least one receptacle for the washing machine and another one in a convenient location.
- For electric dryer see note #27. Electric Dryer.

23. Utility Room or Area

- Install at least one receptacle on a separate circuit for the utility room.
- Install one receptacle in each undeveloped area.

NOTE: *Built-in vacuum motors require a receptacle on a separate circuit located adjacent to the unit.*

- Each utility room shall have a light fixture controlled by a wall switch.

24. Bathrooms and Washrooms

Install one duplex receptacle, protected by a Class A Ground Fault Circuit Interrupter (GFCI) within 1 m (39 inches) of the wash basin. This receptacle should be located at least 1 m (39 inches) from a bathtub or shower stall, never within 500 mm. Measure the distance between receptacle and the inside edge of the bathtub or shower without piercing a wall, partition or similar obstacle. Ark fault protection not required.

25. Outdoor

- Provide at least one receptacle on a separate circuit. Receptacle located on the dwelling including attached carports and attached garages are to be protected by a Ground Fault Circuit Interrupter.
- All receptacles (except for automobile heater receptacles) installed outdoors and within 2.5 m of finished grade shall be protected by a Ground Fault Circuit.
- Receptacles exposed to weather shall be provided with wet location in-use cover plates whether or not a plug is inserted into the receptacle.

26. Sump Pump

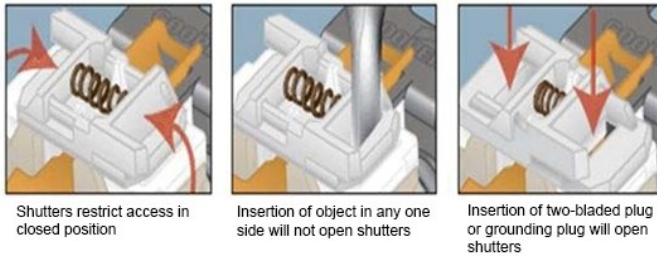
- Provide a single plug outlet on a separate circuit within 1 meter of sump location. If pump is located in a clothes closet ensure the receptacle is a **single receptacle** as so no other devices will be plugged into outlet at the same time. Ark fault protection not required.

TAMPER RESISTANT RECEPTACLES

RULE 26-712(g) AND (h) AND NEW APPENDIX B NOTE

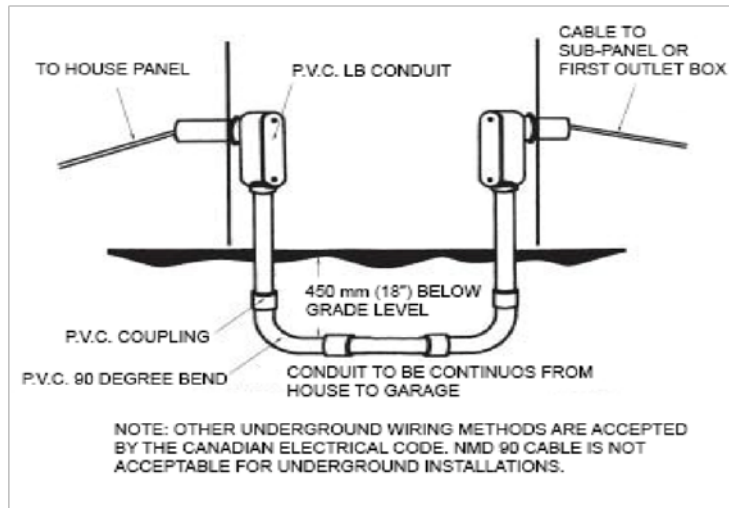


RULE 26-712(g) AND (h) AND NEW APPENDIX B NOTE



UNDERGROUND WIRING TO GARAGE

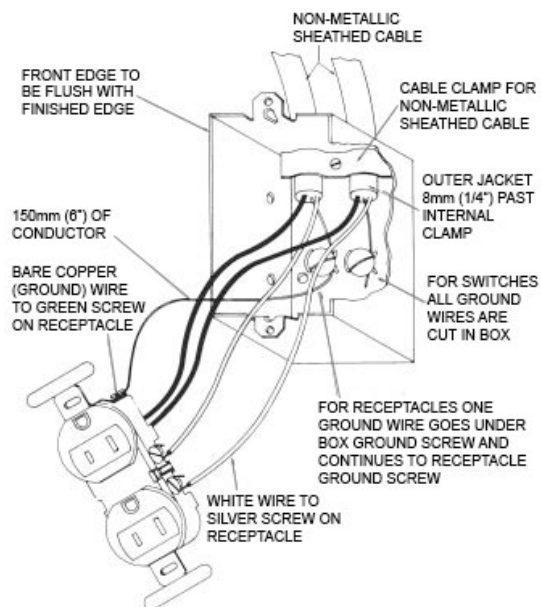
BREAKER SIZE (HOUSE)	TYPE OF CIRCUIT (GARAGE)	SIZE OF CABLE	SIZE OF CONDUIT AND FITTINGS
15 Amps 1 Pole	Single Circuit	2-14 NMWU	3/4" P.V.C.
15 Amps 2 Pole	Double Circuit	3-14 NMWU	3/4" P.V.C.
30 Amps 2 Pole	Feeder Circuit for Sub-panel in Garage	3-10 NMWU	1" P.V.C.
40 Amps 2 Pole		3-8 NMWU	1-1/4" P.V.C.
60 Amps 2 Pole		3-6 NMWU	1-1/2" P.V.C.



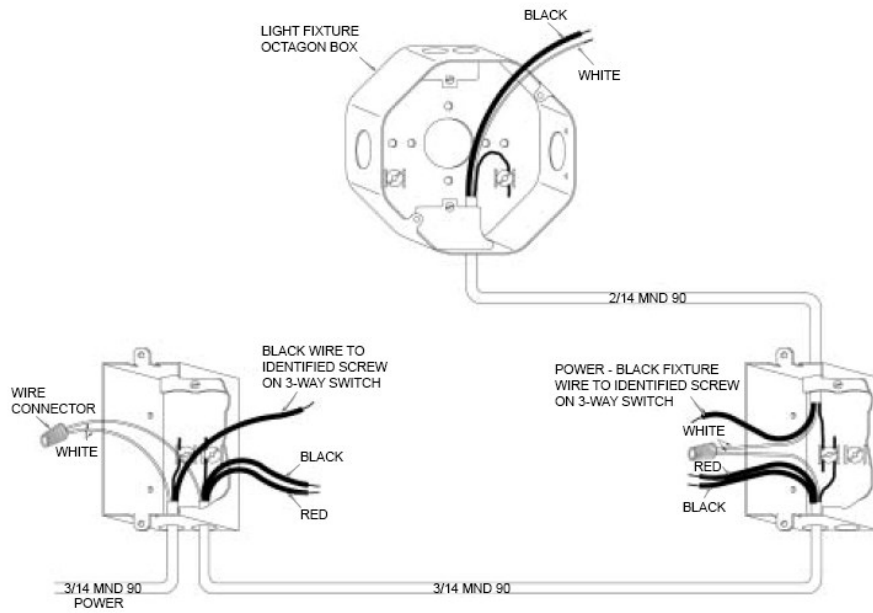
NOTE: DO NOT BACKFILL THE TRENCH PRIOR TO THE FIRST INSPECTION.

- 6 inches, 150mm sand separation is required between gas and electrical lines in trenches. (Gas lines always above Electrical lines when lines are placed above each other)
- Underground conduit to be buried to a depth of 18" deep.

TYPICAL OUTLET BOX



SIMPLE WIRING FOR 3-WAY SWITCH



TYPICAL OCTAGON BOX FOR LIGHT FIXTURE INSTALLATION

