### GENERAL CIRCUIT REQUIREMENTS

| NEC 406.4 and 406.12 | All 125-volt, 15- and 20-amp receptacles installed or replaced in dwelling units shall be listed tamper-resistant. Exceptions include a receptacle located more than 12 inches above floor, a receptacle in space dedicated for an appliance that is not readily moved and placement non-grounding receptacles. |
| NEC 210.11 and 422.12 | In addition to the branch circuits installed to supply general illumination and receptacle outlets in dwelling units, the following minimum requirements apply: Two 20-amp circuits for the kitchen receptacles, One 20-amp circuit for the laundry receptacles, One 20-amp circuit for the bathroom receptacles. An individual branch circuit for central heating equipment. |

### GFCI PROTECTION

| NEC 406.4 and 406.9 | Receptacles installed in wet locations and receptacles in wet locations that are or replaced shall be listed as weather-resistant type. |
| NEC 300.3 | All conductors of the same circuit, including grounding and bonding conductors, shall be contained in the same raceway, cable, or trench. |

### WIRING METHODS

| NEC 314.29 | Junction boxes shall be installed so that the wiring contained in them can be rendered accessible without removing any part of the building. |
| NEC 314.16 | The number of devices and conductors contained within electrical boxes determine the size. Nonmetallic boxes are marked with their inch capacity. |
The Minnesota Energy Code requires that all penetrations through an air barrier be sealed. Sealing of the opening applies to all penetrations including the service entrance, conduit, cables, panels, recessed luminaires and electrical boxes.

EQUIPMENT LISTING AND LABELING

Minnesota Rules 3800.3620 All electrical equipment, including luminaires, devices and appliances used as part of or in connection with an electrical installation shall be listed and labeled by a Nationally Recognized Testing Laboratory (NRTL) as having been tested and found suitable for a specific purpose.

NEC 110.3 All electrical equipment shall be installed and used in accordance with the listing requirements and manufacturer’s instructions.

ELECTRICAL SERVICES

NEC 230.70 The service disconnecting means shall be installed at a readily accessible location outside a building or structure or inside nearest the point of entrance of the service-conductor entrance.

NEC 310.15 Conductor Sizes For 120/240-Volt 3-Wire, Single-Phase, Dwelling Services And Feeders Copper Aluminum Service Rating 4 AWG 2 AWG 1 AWG 2/0 4/0 400 kcmil 4 AWG 2 AWG 1 AWG 2/0 4/0 400 kcmil 100 amps 150 amps 200 amps 600 kcmil 400 kcmil

NEC 110.14 Conductors of dissimilar metals shall not be intermixed unless the device is identified for that purpose. Listed anti-oxidant compound shall be used on all aluminum conductor terminations, unless the device manufacturer states that it is not required.

NEC 300.7 Portions of raceways or sleeves subject to different temperatures (i.e. passing from the interior to the exterior of a building) shall be sealed with an approved material to prevent condensation from entering equipment.

NEC 230.54 Service entrance and overhead service conductors shall be arranged so that water will not enter the service enclosure.

NEC 300.9 The interior of raceways installed in wet locations above grade shall be considered wet locations.

GROUNDING AND BONDING

NEC 250.32 Buildings supplied by a feeder or branch circuit shall have an equipment grounding conductor run with the supply conductors and connected to the grounding electrode system at the building.

NEC 250.30 All grounding electrodes that are present at each building or structure shall be bonded together to form the grounding electrode system.

NEC 250.30 Acceptable grounding electrodes include a metal underground water pipe in direct contact with earth for 10 feet or more, a metal frame of a building or structure, a concrete encased electrode or a ground ring.

NEC 250.30 A metal underground water pipe shall be supplemented by an additional electrode, such as a rod, pipe or plate electrode.

NEC 250.30 Unless a rod, pipe and plate electrode has a resistance to ground of 25 ohms or less, it shall be supplemented with another acceptable electrode.

NEC 250.66 The conductor that is the sole connection to a rod, pipe or plate electrode is not required to be larger than #6 AWG copper.

NEC 250.64 The grounding electrode conductor shall be continuous, securely fastened and protected from physical damage.

GROUNDING WIRING

NEC 250.28 The main bonding jumper - generally the green bonding screw provided by the panel manufacturer - shall be installed in the main service panel.

NEC 250.104 The interior metal water piping and other metal that may become energized shall be bonded to the service equipment with a bonding jumper sized the same as the grounding electrode conductor.

NEC 300.5 Direct buried cable or conduit or other raceways shall meet the following minimum cover requirements:

- Direct Burial Cable: 24 inches
- Rigid or Intermediate Metal Conduit: 6 inches
- Non Metallic Raceway (PVC): 18 inches

The minimum cover for 120-volt residential branch circuits rated 20 amps or less and provided with GFCI protection at their source is permitted to be 12-inches.

NEC 680.10 Underground wiring is not permitted under pools or within 5-feet horizontally from the walls of the pool, unless supplying permitted pool equipment.

NEC 250.5 Underground service laterals shall have their location identified by a warning ribbon placed in the trench at least 12” above the underground installation.

NEC 250.5 Where subject to ground movement, direct buried cables and raceways shall be installed with expansion capability to prevent damage to the enclosed conductors or to the connected equipment.

NEC 110.14 Wire splicing devices for direct burial conductors shall be listed for such use.

NEC 250.5 Conductors emerging from underground shall be installed in rigid metal conduit, intermediate metal conduit, or Schedule 80 rigid nonmetallic conduit from 15’ below grade or the minimum cover distance up to the point of termination above ground.

- Equivalent Size of Service Entrance Conductor: Copper 4 AWG 2 AWG 1 AWG 2/0 3/0
- Size of the Grounding Electrode Conductor: Aluminum 2” 6” 4” 4/0 250 4/0 or 250 4 2

Residential Electrical Inspection Checklist

Based on the 2011 National Electrical Code®

When an owner files a Request for Electrical Inspection form and inspection fees with the Department of Labor & Industry or other electrical inspection authority, that person is signing an affidavit that they own and occupy the residence and that they will personally perform all of the electrical work, including the laying out of such work. ‘Owner’ is defined in MN Stat §326B.31, Subd. 23 as a natural person who physically performs electrical work on premises the person owns and actually occupies as a residence or owns and will occupy as a residence upon completion of construction.

A separate request for electrical inspection form with the required fees must be submitted to the Department at or before commencement of any electrical installation that is required by law to be inspected.

All wiring shall be inspected before it is concealed and the installer shall notify the inspector when the wiring is complete, before the wiring is utilized and the associated space occupied.

It is illegal for an owner to install electrical wiring in mobile home or recreational vehicle parks, or on property that is rented, leased, or occupied by others.

A rough-in inspection must be made before insulation, sheetrock, paneling, or other materials cover any electrical wiring. Underground wiring must be inspected before the trench is back-filled. Except for the final connection to switches, receptacles, and lighting fixtures, all ground wires and other wires in boxes must be spliced and pigtailed for the rough-in inspection.

This brochure is only intended to be a general overview of residential electrical requirements. Reasonable efforts have been made to ensure that this information is current, complete and accurate, however no claim is made that this information is beyond question.

While there are many resources for do-it-yourself owners, please refer to accredited sources for National Electrical Code® information and have your work inspected to assure your electrical installation will be free from fire and electrical shock hazard.

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