NEC 210.12.1 All branch circuits supplying 125-volt, 15- and 20-amp receptacles installed or replaced shall be tamper-resistant. Three exceptions include receptacles located 5 1/2 feet or more above the floor, a receptacle in space dedicated for an appliance that is not readily moved and receptacles that are part of a luminaire.

NEC 316.15 Maximum Overcurrent Protection

Fuse or Circuit Breaker Size

<table>
<thead>
<tr>
<th>Minimum Wire Size</th>
<th>15 amp</th>
<th>20 amp</th>
<th>30 amp</th>
<th>40 amp</th>
<th>50 amp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>14</td>
<td>12</td>
<td>10</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Aluminum</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Note: Conductors that supply motors, air-conditioning units, and other equipment may be overcurrent protected that exceeds the limitations in the above chart.

NEC 210.52 Receptacle outlets in habitable rooms shall be installed so that no point measured horizontally along the floor line in any wall space is more than 6 feet from a receptacle outlet. A receptacle shall be installed in each wall space 2 feet or more in width.

NEC 210.52 At kitchen countertops, receptacle outlets shall be installed so that no point along the wall line is more than 24 inches measured horizontally from a receptacle outlet in that space. Countertop spaces separated by range tops, sinks or refrigerators are separate spaces.

NEC 210.52 A receptacle outlet shall be installed at each counter space 12-inches or wider and at each island 18-inches or wider. Receptacles shall be located not more than 20 inches above the countertop, or not more than 12-inches below the countertop.

NEC 210.52 & 406.9 At least one receptacle accessible from grade shall be installed at the front and back of a dwelling with an extra duty cover that is weatherproof whether or not an attachment plug cap is inserted.

NEC 210.52 Balconies, decks and porches accessible from inside a dwelling unit shall have at least one receptacle located less than 6 1/2 feet above the floor.

NEC 210.52 In attached and detached garages at least one receptacle shall be installed for each car space.

WIRING METHODS

NEC 314.23 All electrical boxes shall be rigidly secured to the building structure.

NEC 314.27 A listed fan box shall be installed where spare conductors are installed to a location acceptable to a ceiling fan.

NEC 334.30 Type NM (nonmetallic) cables shall be securely every 4.5-feet and within 12 inches of each box.

NEC 314.17 The outer jacket of type NM cable shall be secured to the box and extend into the box at least 1/2 inch.

NEC 300.14 The total length of conductors including equipment grounding conductors at all boxes shall be 6-inches with at least 3 inches outside the box.

NEC 300.4 Cables and raceways shall be protected from damage. Where installed through holes in wood framing members, the space between the wire and the nearest edge of the wood shall be protected by a 1 1/16 inch steel plate.

Note: Building codes prohibit holes within 2 inches of the top or bottom of a joist or rafter and notches in the center 1/3 of the span.

NEC 300.22 Type NM cable shall not be installed in plumon spaces, but may be installed perpendicular through joist or stud spaces used as such.

NEC 110.14 Terminals for more than one or for aluminum conductors shall be identified. Where there is more than one grounding wire they shall be tied together with a “pigtail” attached to the grounding terminal of the device.

NEC 200.7 Where permanently re- standard configuration of the conductor, the conductor with white colored insulation in type NM cable may be used as an ungrounded conductor. The neutral conductor shall not be used as the return conductor from a switch to an outlet.

NEC 250.134 All non-current carrying metal parts of electrical equipment, including raceways, metal boxes and equipment shall be connected to an equipment grounding conductor.

NEC 110.12 Unused openings in boxes shall be effectively closed. A non-metallic box shall be replaced if cable openings are punched out but not used.

WIRING METHODS
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.

ELECTRICAL SERVICES

NEC 230.70 The service disconnecting means shall be installed at a readily accessible location either outside a building or structure or inside, but not nearer than 18 inches from the point of entrance of the service-entrance conductors.

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 100 amps
1 AWG 2/0 150 amps
2/0 4/0 200 amps
400 kcmil 600 kcmil 400 amps

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

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

NEC 250.50 Acceptable grounding electrodes include a metal underground water pipe, a metal frame of a building or structure, a rod, pipe or plate electrode, a concrete embedded electrode and a ground ring.

NEC 250.53 A metal underground water pipe electrode shall be supplemented by an additional electrode.

NEC 250.53 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 250.66 The grounding conductor shall be continuous, securely fastened and protected from physical damage. Grounding electrodes conductors are not required to comply with the minimum cover requirements in 300.5.

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 piping that may become energized shall be bonded to the service equipment with a bonding jumper sized the same as the grounding electrode conductor.

UNDERGROUND WIRING

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

Direct Burial Cable Rigid or Intermediate Metal Conduit Non Metallic Raceway (PVC)
24 inches 6 inches 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 300.5 Underground service laterals shall have their location identified by a warning ribbon placed in the trench at least 12" above the underground installation.

NEC 300.5 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 300.5 Conductors emerging from underground shall be installed in rigid metal conduit, intermediate metal conduit, or Schedule 80 rigid nonmetallic conduit from 18" below grade or the minimum cover distance up to the point of termination above ground.

This is a general overview of residential electrical requirements and no claim is made that this information is complete or beyond question. An owner who files a Request for Electrical Inspection form with the Department of Labor & Industry or other electrical inspection authority is signing an affidavit that they own and occupy the residence and that they will personally perform all of the electrical work, including the planning and laying out.

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

All wiring including underground cable and conduit shall be inspected before it is concealed by insulation, sheet-rock, paneling, or other materials. 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.

The installer shall notify the inspector for final inspection when the wiring is complete, before the wiring is utilized and the space occupied.

The Minnesota Energy Code requires that all penetrations through an exterior wall air barrier be sealed. Sealing of the opening applies to all penetrations including the service entrance, conduit, cables, panels, recessed luminaires and electrical boxes.