DEPARTMENT OF LABOR AND INDUSTRY

Electrical inspection checklist for one-family dwellings

Based on the 2023 National Electrical Code (NEC)

001 – An owner (i.e., homeowner) who files a Request for Electrical Inspection form (i.e., permit) with the Department of Labor and Industry or other electrical inspection authority is signing an affidavit and declaring they own and occupy the residence and they will personally perform all the electrical work, including the planning and laying out of the electrical work.

002 – The term "owner" is defined in law as a natural person who physically performs electrical work on premises the person owns and occupies as a residence or owns and will occupy as a residence upon completion of construction. Owner and homeowner are essentially synonymous for the purpose of this explanation.

003 – A separate permit with the required fees must be submitted to the Department at or before the start of any electrical work that is required by law to be inspected.

004 – A homeowner is exempt from having to possess a personal electrical license. However, it is illegal for unlicensed homeowners to install wiring in two-family dwellings, apartment buildings, condo buildings or other common interest community settings, certain townhouse buildings, manufactured homes in parks, recreational vehicles in parks, floating buildings on public waterways, or in or on any property that is rented, leased, or occupied by others.

005 – All wiring including underground cable and conduit must be inspected at the rough-in stage before it is concealed by insulation, sheetrock, backfill or other materials. Except for the final connection to switches, receptacles and lighting fixtures, all equipment grounding wires in boxes must be spliced and pigtailed for the rough-in inspection.

006 – The installer must notify the inspector for final inspection when the wiring is complete and before the wiring is utilized and the space is occupied.

007 – If wiring is concealed before inspection, the person responsible for concealing the wiring is responsible for all costs associated with uncovering and replacing the covering material.

General circuit requirements

008 – NEC 406.4 and 406.12 All 125- and 250-volt, 15- and 20- amp receptacles, installed or replaced in all dwelling units, boathouses, mobile homes, and manufactured homes, including their attached and detached garages, accessory buildings, and their common areas, must be listed as tamper-resistant (TR). Three exceptions include receptacles located 5½ 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.

009 – NEC 210.12 All branch circuits supplying 125-volt, 10-,15- and 20- amp outlets or devices in dwelling unit kitchens, family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, laundry areas, closets, hallways or similar areas must be protected by a listed combination-type AFCI device. AFCI protection is also required where branch circuit wiring or device in the above locations is modified, replaced, or extended.

010 – 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
- One 20- amp circuit for garage receptacles
- One individual branch circuit for central heating equipment. (i.e., furnace)

011 – NEC 406.4 and 406.9 Receptacles that are installed or replaced in wet locations must be listed as weather resistant "WR" and must have an enclosure that is weatherproof with the cord inserted. Covers must be marked "extra duty."

012 – NEC 300.3 All conductors of the same circuit, including grounding and bonding conductors must be contained in the same raceway, cable, or trench.

013 – NEC 408.4 Every circuit and circuit modification must be legibly identified as to its clear, evident and specific purpose or use in sufficient detail on a directory located on the face or inside of the electrical panel doors.

014 – NEC 240.4 Conductors must be protected in accordance with their ampacity per Table 310.15(B)(16) and 240.4(D)

NEC 310.15 Maximum Overcurrent Protection

Fuse or circuit breaker size	**Minimum wire size**	
	Copper	Aluminum
15 amp	14	N/A
20 amp	12	N/A
30 amp	10	8
40 amp	8	6
50 amp	6	4

For certain specific installations, conductors that supply motors, air-conditioning units, and other equipment may be permitted to have overcurrent protection that exceeds the basic limitations in the above chart.

015 – NEC 200.11 and 406.3 Receptacle outlets must be of the grounding-type, be grounded and have the proper polarity.

016 – NEC 210.52 Receptacle outlets in habitable rooms must 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 outlet must be installed in each wall space 2-feet or more in width.

017 – NEC 210.52 At kitchen countertops, receptacle outlets must 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.

018 – NEC 210.52 Receptacle outlets serving the countertop must be located above the countertop as indicated in one or more below:

(1) On or above, but not more than 500 mm (20 in.) above, a countertop or work surface
(2) In a countertop using receptacle outlet assemblies listed for use in countertops
(3) In a work surface using receptacle outlet assemblies listed for use in work surfaces or listed for use in countertops

019 – NEC 210.52 Island countertop, peninsular countertops and/or worksurfaces receptacle outlets, if installed to serve an island or peninsular countertop or work surface, must be installed in the locations indicated above. If a receptacle outlet is not provided to serve an island or peninsular countertop or work surface, provisions must be provided at the island or peninsula for future addition of a receptacle outlet to serve the island or peninsular countertop or work surface.

020 – NEC 210.52 & 406.9 At least one receptacle outlet accessible from grade must 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 in the receptacle outlet.

021 – NEC 210.52 Balconies, decks, and porches accessible from inside a dwelling unit must have at least one receptacle outlet located less than 6½ feet above the floor.

022 – NEC 210.52 In attached and detached garages at least one receptacle outlet must be installed for and in each vehicle bay within 5½ feet from the floor.

023 – In dwelling units, at least one lighting outlet controlled by a listed wall-switch must be installed in every habitable room, kitchen, laundry area, and bathroom. The wall-mounted switch must be located near an entrance to the room on a wall. In other than kitchens, laundry areas, and bathrooms, one or more receptacles controlled by a listed wall-switch is allowed in lieu of lighting outlets.

Additional lighting outlets must be installed in accordance with the following:

(1) At least one lighting outlet controlled by a listed wall-switch must be installed in hallways, stairways, attached garages, detached garages, and accessory buildings with electric power.
(2) Attached garages, and detached garages with electric power, at least one exterior lighting outlet controlled by a listed switch must be installed to provide illumination on the exterior side of outdoor

entrances or exits with grade-level access. A vehicle door in a garage shall not be considered as an outdoor entrance or exit.

(3) Where lighting outlets are installed for an interior stairway with six or more risers between floor levels, there shall be a listed wall-mounted switch at each floor level and at each landing level that includes a stairway entry to control the lighting outlets. Remote, central, or automatic control of lighting is allowed in hallways, in stairways, and at outdoor entrances.

(4) Dimmer control of lighting outlets installed in compliance with (3) is not allowed unless the listed control devices can provide dimming control to maximum brightness at each control location for the interior stairway illumination.

024 – NEC 406.9 The required bathroom receptacle(s) must not be installed within a zone measured 3 feet horizontally and 8 feet vertically from the top of the bathtub rim or shower stall threshold. The identified zone is all-encompassing and must include the space directly over the tub or shower stall and extends down to the floor. There is an exception for a single receptacle allowed for an electronic toilet or personal hygiene device such as an electronic bidet seat. This receptacle must be readily accessible and not located in the space between the toilet and the bathtub or shower. However, if the size of the bathroom is too small and the required distance (zone) requirements can't be met, the receptacle(s) must be permitted to be installed opposite the bathtub rim or shower stall threshold on the farthest wall within the room.

GFCI protections

025 – NEC 210.8(A) and 406.4 The ground-fault circuit-interrupter must be installed in a readily accessible location. Ground-fault circuit-interrupter (GFCI) protection must be provided for all 125-volt through 250-volt, receptacle outlets installed outdoors, indoor damp and wet locations, in boathouses, crawl spaces, basements, laundry areas, garages, accessory buildings, bathrooms, and kitchens. Also, within 6-feet of the top inside edge of all sink bowls, within 6-feet from the outside edge of bathtubs and shower stalls, and areas with sinks and permanent provisions for food preparation, beverage preparation, or cooking, such as wet bars.

GFCI protection must be provided for all lighting outlets installed in crawl spaces.

026 – NEC 210.8(F) GFCI protection must be provided for outdoor outlets that are readily accessible. This would include air conditioners, heat pumps, split mini-HVAC equipment, and similar electrical equipment after September 1, 2026. It would not include and submersible well or sewer lift pump branch circuits.

027 – NEC 210.8(D) GFCI protection must be provided for all dishwashers, sump pumps, electric ranges, wall-mounted ovens, counter-mounted cooking units, clothes dryers, and microwave ovens that are permanently connected, or cord-and-plug connected.

028 – NEC 680.71 Hydro-massage bathtubs must be supplied by an individual branch circuit and must have ground-fault circuit-interrupter protection.

029 – NEC 680.73 Hydro-massage bathtub equipment must be accessible without damaging the building structure or finish. When accessible through an access panel, the receptacle outlet must be within 1-foot of and face the opening.

030 – NEC 680.21(C) All outlets supplying 125- or 240-volt pool pump motors must be provided with GFCI protection.

031 – NEC 680.26 An equipotential bonding grid to mitigate step and touch voltage potential must be installed at outdoor swimming pools, spas and hot tubs and at electrical equipment installed outdoors adjacent to natural and artificially made bodies of water.

Wiring methods

032 – NEC 314.23 All electrical boxes must be rigidly secured to the building structure.

033 – NEC 314.27(C) A listed fan box or a ceiling box with access to a framing member must be installed in all locations where a ceiling paddle could be installed in a habitable room.

034 – NEC 334.30 Type NM (nonmetallic) cables must be secured every 41/2-feet and within 12 inches of each box with no more than 18 inches between the box and the closest point of securement

035 – NEC 314.17 The outer jacket of type NM cable must be secured to the box and extend into the box at least ¼ inch.

036 – NEC 300.14 The minimum length of conductors including equipment grounding conductors in all boxes must be 6-inches, with at least 3-inches of length extended outside the box.

037 – NEC 300.4 Cables and raceways must be protected from damage. Where installed through holes in wood framing, the edge of the hole must be not less than 1¼-inch from the nearest edge of the wood member or must be protected by a 1/16-inch steel plate.

CAUTION: Refer to the Building Code for restrictions on boring, cutting, drilling, and notching of wood framing members

038 – NEC 300.22 Type NM cable must not be installed in environmental plenum air spaces but may be installed perpendicular to the long dimension of joist or stud spaces.

039 – NEC 110.14 Terminals for more than one conductor must be identified. Where there is more than one equipment grounding wire they must be spliced together with a “pigtail” and attached to the singular grounding terminal of the device.

040 – NEC 200.7 Where permanently re-identified at each location where it is visible and accessible, the conductor with white colored insulation in type NM cable may be used as an ungrounded (hot) conductor. The re-identified conductor must not be used as the return conductor from a switch to an outlet.

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

042 – NEC 110.12 Unused openings in boxes must be effectively closed. A nonmetallic box must be replaced if cable openings are punched out but not used.

043 – NEC 408.41 Each grounded circuit conductor (i.e., neutral) within a panelboard must terminate in an individual terminal.

044 – NEC 404.2 Generally, the neutral circuit conductor for the lighting circuit must be installed at locations where switches control lighting loads, unless the wiring is installed in a raceway, the switch box remains accessible, or the switch controls a receptacle load. Dimmers often require a neutral connection.

045 – NEC 314.29 Junction boxes must be accessible without removing any part of the building.

046 – NEC 314.16 The number of conductors and devices to be contained within electrical boxes determines the box size. Nonmetallic boxes are marked with their cubic inch capacity.

Example: a box with four 14/2 w/ground type NM cables:

Cubic inches required for boxes

Conductor Size	14 AWG	12 AWG	10 AWG
Each insulated wire	2	2.25	2.5
All grounding wires combined	2	2.25	2.5
Each switch or receptacle	4	4.5	5
All internal cable clamps	2	2.25	2.5

Example:

- **8 insulated wires = 16 cubic inches**
- All 4 grounding wires = 2 cubic inches
- 1 switch = 4 cubic inches
- 1 receptacle = 4 cubic inches
- All cable clamps = 2 cubic inches
- **Minimum box volume = 28 cubic inches**

NOTE: If you have more than 4 equipment grounding conductors in a box, a further adjustment of ¼ volume allowance needs to be added for each conductor based on the largest wire in the box.

047 – NEC 410.16 Luminaires in clothes closets must have the following minimum clearances from the defined storage space:

- 12 inches for totally enclosed surface mounted incandescent or LED luminaires on the ceiling or above the door
- 6 inches for totally enclosed recessed incandescent or LED luminaires on the ceiling or above the door
- 6 inches for surface mounted or recessed fluorescent luminaires on the ceiling or above the door

048 – NEC 410.16 Defined closet storage space extends from the floor to a height of 6-feet or the highest clothes-hanging rod and 24-inches from the sides and back of the closet walls and continuing vertically to the ceiling parallel to the walls at 12-inches or the shelf width, whichever is greater.

049 – NEC 410.16 Incandescent luminaires with open or partially enclosed lamps and pendant fixtures or lampholders are not permitted in clothes closets.

050 – NEC 410.10 Luminaires installed in wet or damp locations must be installed so that water cannot enter or accumulate and must be marked as suitable for use in wet or damp locations, correspondingly.

Equipment listing and labeling

051 – Minnesota Rules 3801.3620 All electrical equipment, including luminaires, devices and appliances used as part of or in connection with an electrical installation must be listed and labeled by a Nationally Recognized Testing Laboratory (NRTL) as having been tested and found suitable for a specific purpose.

052 – NEC 110.3 Listed electrical equipment must be installed and used in accordance with the listing requirements and the manufacturer's installation instructions.

Electrical services

053 – NEC 230.70 The service disconnecting means must be installed at a readily accessible location either outside a building or structure, or inside nearest the point of entrance of the service-entrance conductors.

054 – NEC 310.12 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

055 – NEC 110.14 Conductors of dissimilar metals must not be intermixed unless the device is listed for the purpose.

056 – NEC 230.67 A dwelling electrical service must be protected by a Type 1 or Type 2 surge protective device and must have a nominal discharge current rating of not less than 10kA.

057 – NEC 230.85 Each dwelling must have an outdoor readily accessible emergency disconnect installed on or within 50 feet of and visible from the dwelling. The emergency disconnect could be a service disconnect for the dwelling or it could be a disconnect supplied by the serving utility. If the disconnect is the service disconnect, it must be labeled as the "EMERGENCY DISCONNECT- SERVICE DISCONNECT". If the disconnect is provided by the

serving utility, and is not the service disconnect, the disconnect must be labeled “EMERGENCY DISCONNECT – NOT SERVICE EQUIPMENT”. The marking must be located on the outside front of the disconnect enclosure with red background and white text. The letters are to be at least 1⁄2 inch high.

058 – NEC 300.7 Portions of raceways or sleeves passing from the interior to the exterior of a building or subject to different temperatures must be filled with an approved material (e.g., Duxseal) to prevent condensation from entering equipment.

059 – NEC 230.54 Service-entrance and overhead service conductors must be arranged so that water will not enter the service enclosure.

060 – NEC 300.9 The interior of raceways installed in wet locations above grade must be considered wet locations.

061 – NEC 300.4 Conductors 4 AWG or larger must be protected by a bushing when entering an enclosure through a raceway.

062 – NEC 230.70 The service disconnecting means must not be in a bathroom.

063 – NEC 240.24 Overcurrent devices must be readily accessible and not located in bathrooms or in the vicinity of easily ignitable materials such as clothes closets.

064 – NEC 408.36 Back-fed overcurrent devices must be secured by an additional approved fastener that requires a tool for removal.

065 – NEC 110.26 Working space must be a minimum of 3-feet in the direction of access to live parts and the width of the equipment or 30 inches, whichever is greater, extending from the floor to 6½-feet and must not be used for storage. The floor in the required working space must be kept clear, and the floor in the working space must be as level and flat as practical for the entire required depth and width of the working space. The space below and above the electrical panelboard from the floor to the ceiling is dedicated for electrical wiring and no piping, ducts or apparatus must be in this space.

066 – NEC 110.26 Illumination must be provided for the working space about service equipment and panelboards.

Grounding and bonding

067 – NEC 250.28 The main bonding jumper (generally the green bonding screw or strap provided by the panel manufacturer) must be installed in the main service panel.

068 – NEC 250.32 Detached buildings or structures supplied by a feeder or branch circuit must have an equipment grounding conductor installed with the supply conductors and connected to the grounding electrode system at the building or structure.

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

070 – NEC 250.52 Acceptable grounding electrodes include at least 10-feet of metal underground water pipe, a metal frame of a building or structure, a rod, pipe or plate electrode, a concrete encased electrode or a ground ring. All must be in direct contact with the earth

071 – NEC 250.53 A metal underground water pipe electrode must be supplemented by an additional electrode.

072 – NEC 250.53 Unless a rod, pipe and plate electrode have a resistance to ground of 25 ohms or less, it must be supplemented with another acceptable electrode other than an underground water pipe.

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

074 – NEC 250.64 The grounding electrode conductor must be continuous, securely fastened and protected from physical damage. Grounding electrode conductors are not required to comply with the minimum cover requirements in 300.5

Underground wiring

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

Direct Burial Cable	Rigid or Intermediate Metal Conduit	Nonmetallic Raceway (PVC)
24 inches	6 inches	18 inches

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

076 – NEC 300.5 Underground service conductors must have their location identified by a warning ribbon placed in the trench at least 12-inches above the underground installation.

077 – NEC 300.5 Where subject to ground movement such as Minnesota's freeze-thaw, winter-summer seasons, direct buried cables and raceways must be installed with expansion capability to prevent damage to the enclosed conductors or to the connected equipment.

078 – NEC 110.14 Wire splicing devices for direct burial conductors must be listed for such use.

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

Equivalent Size of Service Entrance Conductor		Size of the Grounding Electrode Conductor	
Copper	Aluminum	Copper	Aluminum
4 AWG	2	8	6
1 AWG	2/0	6	4
2/0 or 3/0	4/0 or 250	4	2

This document is a general overview of residential electrical requirements. For complete regulations, please refer to the National Electrical Code and Minnesota Statutes and Rules

- Contact us at dli.electricity@state.mn.us.
- Online electrical permits
- State and local electrical inspector directory