

NEC Requirements for Open Electrical Boxes

Under the **National Electrical Code (NEC)**, “open electrical boxes” — such as outlet, device, junction, pull, and conduit bodies — must meet specific safety, accessibility, and construction requirements to protect wiring, prevent hazards, and allow future maintenance.

1. Accessibility (NEC 314.29)

Boxes must be installed so the wiring inside can be accessed **without removing any part of the building or structure**. This means:

- Not buried behind drywall, plaster, or embedded in finished ceilings.
- Not hidden under flooring or in permanent cabinetry panels.
- In underground installations, must be accessible without excavating sidewalks, paving, or other finished surfaces [Electrical License Renewal .com](#).

2. Splices and Terminations (NEC 300.15)

All splices, terminations, and device connections must be enclosed in an **approved box or conduit body**. Open wiring or taped connections are not allowed [topcabinet.com](#).

3. Box Fill (NEC 314.16)

The box must have enough internal volume to accommodate all conductors, devices, and fittings without damaging insulation. For example:

- 3–6 conductors: 18 cu in
- 7–8 conductors: 20 cu in [Polycase](#).

4. Material and Construction (NEC 314.2–314.4)

- Metal boxes**: Must be grounded and bonded to maintain electrical continuity (NEC 250.110; grounding screw or clip as required) [Polycase](#).
- Nonmetallic boxes**: Must be non-combustible and suitable for the environment; avoid mixing with metallic raceways unless listed for such use [Nassau National Cable+1](#).
- Round boxes**: Not allowed where locknuts or bushings attach to the side [Nassau National Cable](#).

5. Installation and Mounting (NEC 314.20–314.23)

- Flush with the finished surface in walls or ceilings.
- Securely fastened to framing, brackets, or listed support systems.
- Rigid and protected from physical damage [Nassau National Cable](#).

6. Environmental Protection (NEC 314.15)

In damp or wet locations:

- Box must be listed for the environment.
- Use weatherproof covers, gaskets, and proper sealing to prevent moisture entry [Nassau National Cable](#).

7. Cover and Sealing

Every box must have a **suitable cover or faceplate** to protect wiring and prevent accidental contact