

LED INSTALLER QUICK CODE REFERENCE

Top 10 NEC Considerations for LED Installers (2023 NEC Reference)

This guide is intended for licensed electrical professionals. This document is for general reference only and does not replace the NEC or local amendments. The Authority Having Jurisdiction (AHJ) has final interpretation authority. Local amendments override national code. Code references reflect the 2023 NEC unless otherwise noted. Installers are responsible for verifying equipment listings and installation instructions per NEC 110.3(B).

1. Stay Within Class 2 Limits

NEC Article 725

Class 2 output is limited by NEC 725.121 and associated tables, typically not exceeding 30V and 100VA for LED applications. Exceeding this pushes you into Class 1 or other stricter wiring methods.

2. Know Your Circuit Class

NEC Articles 724 & 725

- Class 1 circuits are covered under Article 724 (2023 NEC) and are installed similar to line voltage wiring.
- Class 2 and Class 3 circuits are covered under Article 725 and are power-limited systems.
- Class 4 circuits, covered under Article 726, are fault-managed power systems that require listed equipment and are not universally adopted.

Most LED strip installations fall under Class 2.

3. Article 411 Covers the Lighting System

NEC Article 411

Article 411 applies to complete lighting systems, not just the LED strip itself, supplied by a listed Class 2 power source operating at 30V or less. Inspectors often check 411 for the luminaire system and 725 for wiring methods.

4. Conduit is Often Not Required (But Check Locally)

NEC 725.130 & 725.154

Listed Class 2 cables may be installed without conduit where permitted by 725.130 and 725.154 and where the cable type is suitable for the environment. Class 2 cable must be listed for the installation environment (CL2, CL2P, CL2R, etc.)

Major municipalities such as Chicago, New York City, Los Angeles, and Boston often require metallic raceway or additional permitting for low-voltage systems, including Class 2.

5. Keep Class 2 and Line Voltage Separate

NEC 725.136

Low voltage conductors cannot share raceways with line voltage unless separated by a listed barrier or approved method.

6. Use Listed & Labeled Power Supplies

NEC 110.3(B), UL 8750, UL 1310

Equipment must be listed for its intended use. Look for power supplies listed for LED use (commonly UL 8750 and/or UL 1310 where applicable).

7. Watch Voltage Drop (Design Best Practice)

NEC Informational Notes to 210.19 & 215.2

The NEC includes Informational Notes recommending 3% voltage drop for branch circuits. Excessive drop creates dim or uneven LED output.

8. Pools & Spas Have Special Rules

NEC Article 680

Pool and spa installations often require bonding, GFCI protection, and listed transformers or power supplies per Article 680. Wet contact locations are highly restricted.

9. Wet Location Voltage Limits Matter

NEC Article 411

- **Wet contact locations:** typically limited to 15V (commonly 12V). Exposed conductors in wet contact locations are limited to 15V maximum per 411.5(B) and must be supplied by a listed Class 2 source.
- **Dry locations:** up to 30V Confirm exact installation environment before selecting driver voltage.

10. Permits & Editions Vary by Jurisdiction

NEC 90.4 (AHJ Authority – Electrical Inspector)

The Authority Having Jurisdiction has final say. Confirm:

- Adopted NEC edition (2023, 2020, etc.)
- Permit requirements for Class 2
- Local conduit amendments