

Storey County Community Development

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2023 NEC Surge Protection Guidelines for Inspections

Based on 2020 & 2023 NEC, 2024 International Residential Code

I. Codes:

- **NEC 230.67 (2020 & 2023 Editions)** – Surge Protection for Dwelling Units and Similar Occupancies
- **2023 NEC Personnel Safety Requirement** – Surge protection required for safety circuits subject to surge damage
- **2024 International Residential Code: (IRC):** – Section E3902.17 Surge Protection

II. Occupancies Requiring Surge Protection

Under the 2023 NEC, surge protection is required for services supplying:

1. Dwelling Units
2. Dormitory Units
3. Hotel and Motel Guest Rooms or Guest Suites
4. Nursing Homes and Limited-Care Facilities
5. Patient Sleeping Rooms

2024 IRC Surge Protection Requirements: Section E3902.17 Surge Protection

- **Scope:** Surge protection devices (SPDs) are required for all dwelling units.
- **Location:** The SPD must be installed at the service equipment or at the first disconnect for the dwelling.
- **Type:** The SPD must be a Type 1 or Type 2 device as defined by UL 1449.
 - Type 1: Installed between the secondary of the service transformer and the line side of the service disconnect.
 - Type 2: Installed on the load side of the service disconnect.
- **Purpose:** Protects against transient overvoltage from lightning, utility switching, or other sources.
- **Listing:** The SPD must be listed and labeled for the purpose.

Inspector Action:

- Confirm occupancy classification.
 - Verify that required services supplying these occupancies are protected by an SPD.
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III. Service-Level Surge Protection Requirements**A. SPD Required at Service**

All services supplying the above occupancies shall be provided with a listed Surge Protective Device (SPD).

Inspector Verification:

- SPD present at each applicable service.
- SPD is listed and properly identified.

B. Location Requirements

The SPD shall be:

- Integral to the service equipment
OR
- Installed immediately adjacent to the service equipment

Inspector Verification:

- Confirm physical location relative to service disconnect.
 - Ensure installation complies with manufacturer instructions.
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C. Acceptable SPD Types

The SPD must be:

- **Type 1 SPD** – Installed ahead of the service entrance (line side).
 - Protects against external surges and direct lightning strikes.
- **Type 2 SPD** – Installed on the load side of service entrances and distribution panels.
 - Protects against internal surges and indirect lightning events.

Inspector Verification:

- Confirm device labeling (Type 1 or Type 2).
 - Confirm installation location matches device rating.
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IV. Personnel Safety Circuits (New Emphasis – 2023 NEC)

The 2023 NEC requires:

Safety circuits for personnel protection that are subject to damage from surge events shall have surge protection installed with or immediately adjacent to the control panel.

Examples may include:

- Emergency systems
- Fire alarm systems
- Elevator controls
- Medical life-safety systems

Inspector Action:

- Identify applicable safety circuits.
 - Confirm SPD installation at or adjacent to control panels.
 - Verify listing and proper installation.
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V. Installation Considerations

Inspectors should verify:

- SPD is properly listed and labeled.
 - Installation follows manufacturer instructions.
 - Conductor length is minimized (to reduce let-through voltage).
 - Proper grounding and bonding are in place.
 - Required overcurrent protection is provided where applicable.
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VI. Layered (Cascading) Protection – Recommended Best Practice

While service-level protection is mandatory for applicable occupancies, layered protection enhances compliance and system reliability.

Recommended levels include:

1. Service-Level SPD (Type 1 or Type 2)
2. Distribution Panel SPD
3. Branch Circuit SPD (Type 2)

4. Point-of-Use Protection:

- Surge Protection Receptacles
- Surge Protection Strips

Layered protection helps ensure equipment and occupant safety throughout the system.

VII. Documentation Review

Inspectors should confirm:

- Manufacturer cut sheets are provided.
 - SPD type and ratings are documented.
 - Installation matches approved plans.
 - As-built drawings reflect SPD locations (when required).
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VIII. Enforcement Considerations

It is a code violation to install or modify electrical systems regulated by the adopted NEC without proper permitting and inspection.

Inspectors should:

- Confirm permits were obtained.
 - Ensure surge protection requirements are included in plan review.
 - Verify compliance during rough and final inspections.
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