



# Solar Photovoltaic & Energy Storage Submittal Checklist (NEC 2023)

## **General Information**

- Site Plan – Show the property layout, structure locations, and solar panel placement.
- System Description – Include a narrative explaining the system design, components, and intended operation.
- Equipment Cut Sheets & Manufacturer Specifications – Provide data sheets for all major components (solar panels, inverters, charge controllers, batteries, etc.).

## **Electrical Design Documentation**

- One-Line Diagram (Single-Line Diagram) – Show the system wiring from PV array to battery storage, inverters, and main service panel (if applicable).
- Three-Line Diagram (if required) – Include wire sizes, conduit specifications, overcurrent protection, disconnects, grounding, and bonding.

## **Solar PV Array Requirements (Article 690 - NEC 2023)**

- PV Panel Specifications – Include model, voltage, current, and power ratings.
- PV Wire & Conduit Sizing – Ensure proper ampacity calculations per NEC 690.8(A).
- Overcurrent Protection – Include fuse or circuit breaker details per NEC 690.9.
- Rapid Shutdown Compliance – Required for rooftop systems per NEC 690.12.
- Access and pathways to the ridge. Not fewer than two 36-inch-wide pathways on separate roof planes, from lowest roof edge to ridge, shall be provided on all buildings. Not fewer than one pathway shall be provided on the street or driveway side of the roof. For each roof plane with a photovoltaic array, not fewer than one 36-inch-wide pathway from lowest roof edge to ridge shall be provided on the same roof plane as the photovoltaic array, on an adjacent roof plane or straddling the same and adjacent roof planes. IFC 1205
- Setbacks at ridge. For photovoltaic arrays occupying 33 percent or less of the plan view total roof area, a setback of not less than 18 inches wide is required on both sides of a horizontal ridge. For photovoltaic arrays occupying more than 33 percent of the plan view total roof area, a setback of not less than 36 inches wide is required on both sides of a horizontal ridge. IFC 1205

## **Inverter & Electrical Interconnections**

- Inverter Specifications – Provide inverter ratings and type (on-grid, off-grid or hybrid).
- Disconnecting Means – Label AC/DC disconnects per NEC 690.13.
- Overcurrent Protection – Comply with NEC 690.9.
- Neutral-Ground Bonding – Ensure compliance with NEC 250.30(A).

### **Grounding & Bonding (Article 250 - NEC 2023)**

- Grounding Electrode System (GES) – Identify ground rod(s), plate, or UFER ground.
- PV Equipment Grounding – Verify grounding per NEC 690.43.
- Battery System Bonding – Follow requirements in NEC 250.122 & 706.30.

### **Labels & Signage (NEC 690 & NEC 705.10)**

- Rapid Shutdown Label – Required for rooftop PV systems.
- Battery Storage Warning Labels – Identify voltage, chemistry, and hazard warnings.
- Disconnecting Means Labels – Clearly mark all AC/DC disconnects.

### **Structural & Mechanical Considerations**

- Structural Load Calculations – If roof-mounted, provide engineer-certified structural analysis.
- Wind Load Compliance – Verify attachment methods meet local wind speed ratings.
- Fire Code Compliance – Maintain fire access pathways per local fire codes.

### **Battery Storage & Energy Storage Systems (Article 706 - NEC 2023)**

- Battery Type & Capacity – Specify battery chemistry (LiFePO<sub>4</sub>, lead-acid, etc.), voltage, and amp-hour ratings.
- Battery Enclosure Details – Show ventilation and thermal management compliance.
- Overcurrent Protection & Disconnects – Compliant with NEC 706.7 & NEC 240.
- Grounding & Bonding Plan – As per NEC 250 & NEC 706.30

### **Battery Storage & Energy Storage Systems (IRC R330)**

**Locations.** ESS shall be installed only in the following locations:

- Detached garages and accessory structures. Attached garages separated from the dwelling unit living space. Outdoors located not less than 3 feet from doors and windows. Enclosed utility closets, basements, storage or utility spaces within dwelling units with finished or noncombustible walls and ceilings. Walls and ceilings of unfinished wood-framed construction shall be provided with not less than 5/8-inch Type X gypsum wallboard. Openings into the dwelling shall be 20-minute fire protection rating. Doors shall be self-latching and self-closing.
- ESS shall not be installed in sleeping rooms, or closets or spaces opening directly into sleeping rooms.
- Individual ESS units shall have a maximum rating of 20 kWh. The aggregate rating of the ESS shall not exceed:
  - 40 kWh within utility closets, basements and storage or utility spaces.
  - 80 kWh in attached or detached garages and detached accessory structures.
  - 80 kWh on exterior walls.
  - 80 kWh outdoors on the ground.

