



NORTHSTAR FIRE DEPARTMENT



Battery Back-up Systems – Guidelines & Specifications

Fire Prevention Guideline P-10

PURPOSE

To provide the recommended minimum submittal requirements for new interactive battery storage systems.

SCOPE

This guideline pertains to all projects involving one- and two-family dwellings (with or without a solar photovoltaic system) within the Northstar Community Services District's jurisdiction where back-up battery powered systems have been chosen. It is the owner's responsibility to retain qualified firms or individuals to conduct smoke control system design and testing. The following information outlines the required steps to process smoke control system design, plan review, and final system acceptance testing.

SUBMITTAL REQUIREMENTS

This list is not intended for integration with bipolar or hybrid PV systems. Systems must be in compliance with current California Building Standards Codes and local amendments. Plans should be clear, and legible.

This handout is designed for the average submittal. Each project is individual, additional submittal requirements and / or information might be necessary based on the actual system design.

1. **1 FULL SET OF PLANS SUBMITTED ELECTRONICALLY - MINIMUM PLAN SIZE IS 11"X17" - MINIMUM FONT SIZE IS 10 -**
 - 1.1 Complete permit application. Fees are due at time of permit submittal, check or cash.
 - 1.2 Permit Application: <https://www.northstarcsd.org>.
2. Include the applicable codes on the cover sheet for the project.
3. Include a complete scope of work on the cover sheet for the project. Identify if the system is to be used as an emergency, **legally required standby or optional standby** power source and if it is interconnected to **an alternative energy system such as a photovoltaic system**. Denote whether battery storage system is AC-coupled or DC-coupled.
4. If a photovoltaic system is being applied for at the same time, see the Northstar Community Services website for the submittal requirements at <https://www.northstarcsd.org>.
5. Include a legend or key for the site and floor plan.

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6. Provide an accurate site plan and floor plan showing the following:
 - 6.1 The location of the structure the system is to be installed on / in and the location of all equipment that is to be interconnected with the battery system including but not limited to existing utility service, existing sub-panel, existing Photovoltaic system. Identify what equipment is existing and what is new.
 - 6.2 Clearly identify the location and or room the batteries are to be installed in. Identify if they are wall or floor mounted. If there is to be more than one battery and they are wall mounted or mounted on a floor, provide structural calculations for the loads of the batteries to the structure.
 - 6.3 Show required (indoor/outdoor) working clearances for new electrical equipment on floor plan.
 - 6.4 Show method and location of required ventilation equipment (if required) for indoor installations.
 - 6.5 Show physical clearances from combustibles on floor plan.
 - 6.6 Show method of protection from physical damage for battery storage system.
 - 6.7 Show means of access to battery storage system.
 - 6.8 Show location and/or method of rapid shutdown initiation of the storage battery system, when integrated with photovoltaic.
 - 6.9 Show conduit/cable routing of battery storage system, PV, and related circuits.
 - 6.10 Show trench details if applicable, show overhead runs if applicable. Denote whether conductors are routed indoors or outdoors.
7. Show the location of the first responders disconnect for the system. Demonstrating that the battery storage system can be disconnected from the premise wiring.
8. Provide a complete line diagram for the system. Include wire sizing calculations. See bullet point 8 for calculations requirements.
 - 8.1 Show grounding and bonding for battery storage system, including the ground return path.
 - 8.2 Show method of interconnection of battery storage system.
 - 8.3 Show overcurrent protection method and rating when required.
 - 8.4 Include detailed wiring information for all new circuits, including:
 - Conductor size/type
 - Number of conductors
 - Conduit size
 - Conduit type
 - 8.5 Show all disconnecting means.
 - 8.6 Show ratings (voltage, ampacity, environmental, etc.) for new and existing service equipment.

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- 9.** Calculations:
 - 9.1 Show calculations for sizing of new conductors.
 - 9.2 Show calculations for overcurrent protection ratings.
 - 9.3 Show short circuit current calculations.
 - 9.4 Show open circuit voltage calculations.
 - 9.5 Show calculation for point of connection to service.
 - 9.6 Provide load calculations for new panelboards with loads (according to Article 220).
 - 9.7 Calculations for the system shall include the output voltage of the battery inverters for the system.

- 10.** For emergency systems with an automatic transfer switch; provide calculations demonstrating compliance with the current California Electric Code for the size of the system and the loads it serves per CEC 702.4.

- 11.** Calculations for the system shall include the output voltage of the battery inverters for the system.

- 12.** Provide manufactures specifications and installation instructions for all new equipment such as:
 - 12.1 Transformer or autotransformer
 - 12.2 Transfer switch(es)
 - 12.3 Battery
 - 12.4 Battery support or racking
 - 12.5 Converters
 - 12.6 Combiner
 - 12.7 Interconnecting cables and connectors
 - 12.8 Recombiner
 - 12.9 Charge controller

- 13.** Show all markings and labels required for newly installed equipment.