



# City of Sonoma – ESS CHECKLIST

## Submittal Checklist for Permitting of (Battery) Energy Storage Systems (ESS)

Rev 1/1/20

This checklist contains the minimum submittal requirements for electrical and structural plan review of new Energy Storage Systems (ESSs) for one- and two-family dwellings with or without a solar photovoltaic (PV) system. 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 made by the City of Sonoma. Plans must be clear and legible. Additional submittal requirements and/or information might be necessary based on the actual system design.

### 1. Approval Requirements

- a) The Building Department will conduct a plan review and the inspections for ESS installations.
- b) Planning Department plan review approval is not required for ESS installations unless the installation is visible from a public street or if the Building Official determines that the proposed ESS will not comply with setback requirements prescribed in the City’s Development Code.
- c) Fire Department plan review and inspection approval is required for ESS installations where the stationary storage battery system (i.e., energy storage systems (ESS)) has a capacity exceeding the values shown in CA Fire Code (CFC) Table 1206.2. Those systems shall comply with CFC sections 1206.2.1 through 1206.12.6. For example, installing two Tesla Powerwalls would trigger a review for compliance with the applicable code sections since they are lithium-ion and are a rated at 13.5 kWh each.

TABLE 1206.2  
BATTERY STORAGE SYSTEM THRESHOLD QUANTITIES.

BATTERY TECHNOLOGY	CAPACITY*
Flow batteries <sup>b</sup>	20 kWh
Lead acid, all types	70 kWh
Lithium, all types	20 kWh
Nickel cadmium (Ni-Cd)	70 kWh
Sodium, all types	20 kWh <sup>c</sup>
Other battery technologies	10 kWh

For SI: 1 kilowatt hour = 3.6 megajoules.

a. For batteries rated in amp-hours, kWh shall equal rated voltage times amp-hour rating divided by 1000.

b. Shall include vanadium, zinc-bromine, polysulfide-bromide, and other flowing electrolyte-type technologies.

c. 70 kWh for sodium-ion technologies.

2019 CALIFORNIA FIRE CODE

### 2. Submittal Information

- a) All forms and checklists described herein are available on the City’s web site located at <http://www.sonomacity.org/Government/Departmental-Offices/Building.aspx>.
- b) A completed City of Sonoma Building Permit application (available at Sonoma City Hall or on the City’s web site) is required for all ESS installations. A \$100.00 permit application deposit payable to the City of Sonoma is required at the time of application. **Please indicate the battery technology and cumulative battery capacity in the Description of Work on the permit application.**

- c) To expedite plan review, one copy of this checklist should be completed and submitted to the Building Department along with the Building Permit application, plans and supporting documentation. Please provide an explanation for any checklist item not completed or met.
- d) If a photovoltaic system is being applied for at the same time, please refer to the City of Sonoma [Expedited Solar Permitting for One & Two-Family Dwellings](#) for additional submittal requirements.
- e) Provide three (3) sets of plans for the proposed ESS (36" x 24" preferred plan size, 11"x 17" minimum plan size; 1/8" = 1'-0" minimum scale, 9 pt. Arial or equal font size or 1/8" minimum neatly hand printed lettering). Plan submittals shall be clear and easily readable in landscape orientation and must include, but not be limited to:
  - 1) A Title Page
  - 2) A Site Plan **[Not required if all equipment is installed within an existing one- or two-family garage or carport]**
  - 3) An Electrical Floor Plan **[Not required for exterior only ESS equipment installations.]**
  - 4) A Three-Line Electrical Diagram
  - 5) Elevation drawing
  - 6) ESS Manufacturer Installation Details and Specifications.
  - 7) Electrical Calculation Worksheet

### 3. General Requirements for Energy Storage Systems (ESS) to be Shown and Noted on Plans:

Use the following checklist items for preparation and submittal of your plans. The level of detail and the specific plan requirements will depend upon the extent, nature and complexity of the work to be done. All applicable checklist items must be noted or specified on the plans. Indicate the plan sheet number where the applicable requirement is shown or specified.

### 4. Type of Energy Storage Systems (ESS) (please complete or check all that apply)

Battery Technology:	<input type="checkbox"/> Flow batteries <input type="checkbox"/> Lead acid, all types <input type="checkbox"/> Lithium, all types	<input type="checkbox"/> Nickel cadmium (Ni-Cd) <input type="checkbox"/> Sodium, all types <input type="checkbox"/> Other battery technologies: _____
Standby Type:	<input type="checkbox"/> Optional standby system; or <input type="checkbox"/> Legally required standby	
ESS Classification:	<input type="checkbox"/> ESS, Self-contained <input type="checkbox"/> ESS, Pre-engineered <input type="checkbox"/> ESS, Other: _____	
Specify the Quantity of ESS Batteries:		
Specify Total (cumulative) Capacity <sup>1</sup> :		
Is ESS Connected to Solar PV?	<input type="checkbox"/> Yes <input type="checkbox"/> No	

<sup>1</sup> For batteries rated in amp-hour, kWh shall equal rated voltage times amp-hour rating divided by 1000.

## 5. Submittal Requirements Checklist for Energy Storage Systems (ESS)

PERMIT APPLICATION REQUIREMENTS	
Yes <input type="checkbox"/> No <input type="checkbox"/>	1. The permit application is complete with the following information: <ul style="list-style-type: none"> <li>• Project address and parcel number,</li> <li>• Owner name, address and phone number;</li> <li>• Contractor name, address and phone number and contractor's license number; and</li> <li>• Other information requested on the permit application form?</li> </ul>
Provided?	PLAN SUBMITTAL REQUIREMENTS
Yes <input type="checkbox"/> No <input type="checkbox"/>	2. The drawings are: <ul style="list-style-type: none"> <li>• drawn to scale;</li> <li>• on a paper size not less than 17" wide by 11" high (36" x 24" preferred);</li> <li>• oriented in landscape orientation;</li> <li>• are printed with text with not less than 9 point Arial font size or equal or 1/8" minimum neatly hand printed lettering;</li> <li>• provided with symbol legend and/or key for the site and floor plans?</li> </ul>
Yes <input type="checkbox"/> No <input type="checkbox"/>	3. The plans include a <b>Title Page</b> with property information including, but not limited to: <ul style="list-style-type: none"> <li>• address of property;</li> <li>• name, address, phone number of the property owner;</li> <li>• name, address, phone number and license number of the person responsible for the ESS system design;</li> <li>• the codes applicable to the project;</li> <li>• a narrative of the complete scope of work;</li> <li>• occupancy and use of the facilities; and</li> <li>• Identify if the ESS is to be used as a partial home backup or a whole home backup.</li> </ul>
Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> <sup>2</sup>	4. A <b>Site Plan</b> (not a satellite image) is included with the permit application and includes the following information? <b>[Not required if ESS equipment installed entirely within an existing one- or two-family residential structure (i.e. garage or carport)].</b> <ul style="list-style-type: none"> <li>• A legend or symbol key.</li> <li>• Location and name of structures on the site;</li> <li>• Property lines, streets, lot dimensions, north arrow, the distance from property lines to structures and the proposed ESS equipment;</li> <li>• Location and working clearances for ESS equipment, main electric service panel, disconnects, overcurrent protection and control units;</li> <li>• Show conduit/cable routing of the ESS, PV, and related circuits. Show trench or overhead runs, as applicable, and denote whether conductors are routed indoors or outdoors.</li> <li>• Detail and specify requirements for the proposed work. <b>[See Plan - General Requirements and Plan- Signage below.]</b></li> </ul>

<sup>2</sup> N/A means Not Applicable to this project.

<p>Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/></p>	<p>5. An <b>Electrical Floor Plan</b> is included with the permit application and includes the following information? <b>[Not required for exterior only installations.]</b></p> <ul style="list-style-type: none"> <li>• A floor plan view of the location of the proposed ESS equipment is provided. Label the use of the space or area where the ESS will be installed. Show all required clearances in front of the batteries and equipment. Specify mounting heights;</li> <li>• All applicable electrical plan related requirements of CA Electrical Code Article 706 and CA Fire Code Section 1206 are shown or specified on the plan;</li> <li>• Detail and specify requirements for the proposed work. <b>[See Plan - General Requirements and Plan- Signage below.]</b></li> <li>• If installed in a garage, show how batteries and equipment are protected from physical damage. (CRC R327.6)</li> <li>• If installed in a garage, show that the required 10-foot x 20-foot clear parking space will be maintained.</li> <li>• Show method and location of required ventilation equipment (if required for indoor installations per CEC 110.13(B) and &amp; 706.10(A)).</li> <li>• Show how working space illumination around the ESS equipment and components is provided. (CEC 706.10(E)).</li> </ul>
<p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>	<p>6. A <b>Three-Line Electrical Diagram</b> is included with the permit application and includes the following information?</p> <ul style="list-style-type: none"> <li>• Show grounding and bonding for the ESS and PV (if installed), including the ground return path.</li> <li>• Show method of interconnection.</li> <li>• Show overcurrent protection method and rating when required.</li> <li>• Include detailed wiring information for all new circuits, including: <ul style="list-style-type: none"> <li>○ Conductor size/type</li> <li>○ Number of conductors</li> <li>○ Conduit size</li> <li>○ Conduit type</li> <li>○ Show all disconnecting means.</li> <li>○ Show ratings (voltage, ampacity, environmental, etc.) for new and existing service equipment.</li> </ul> </li> <li>• Show and label all ESS equipment on the diagram;</li> <li>• Conductor and conduit size, type and location;</li> <li>• The size and location of the main electric panel, distribution panels (sub panels); overcurrent protection, disconnects, additional meters, and ESS equipment;</li> <li>• Denote whether the ESS is ac-coupled or dc-coupled. <ul style="list-style-type: none"> <li>○ If system is dc-coupled, show that the rapid shutdown functionality for controlled conductors of a roof-mounted PV system remains unaffected by dc-coupled energy storage battery circuit(s).</li> </ul> </li> </ul>

Yes <input type="checkbox"/> No <input type="checkbox"/>	7. An <b>Elevation drawing</b> of the system equipment and components is provided. <ul style="list-style-type: none"> <li>• Show signage for ESS disconnecting means are proved per CEC 706.7(D).</li> <li>• Identify if the ESS will be wall- or floor-mounted.</li> <li>• If the ESS is wall-mounted and its weight is 200 lbs. (or more), you must provide structural details in the drawings and calculations as a separate document. [CA Building Code (CBC) 1603.1.8]</li> <li>• If multiple ESSs are installed and the combined weight is 400 lbs. (or more), provide structural details in the drawings and calculations as a separate document. (CBC 1616.10.15)</li> <li>• Provide a permanent plaque or directory denoting all electric power sources operating in parallel with a primary power source on or in the premises, which shall be installed at the main service panel and at all locations of all electric power production sources capable of being interconnected. (CEC 705.10)</li> </ul>
Yes <input type="checkbox"/> No <input type="checkbox"/>	8. Provide two (2) copies of <b>Electrical Calculations</b> for: <ul style="list-style-type: none"> <li>• Sizing of new conductors</li> <li>• Overcurrent protection ratings</li> <li>• Open circuit voltage calculations</li> <li>• Short circuit current calculations.</li> <li>• Point of connection to service</li> <li>• New panelboards with loads per CEC Article 220</li> </ul>
Yes <input type="checkbox"/> No <input type="checkbox"/>	9. Provide two (2) sets <b>ESS Specifications and Manufacturer Installation Instructions</b> . <ul style="list-style-type: none"> <li>• Provide specification sheets and installation instructions for the ESS equipment and components including the following as applicable:             <ul style="list-style-type: none"> <li>○ Inverter</li> <li>○ Transformer or autotransformer</li> <li>○ Transfer switch(es)</li> <li>○ ESS</li> <li>○ ESS support or racking</li> <li>○ Converters</li> <li>○ Combiner</li> <li>○ Interconnecting cables and connectors</li> <li>○ Recombiner</li> <li>○ Charge controller</li> </ul> </li> </ul>
Yes <input type="checkbox"/> No <input type="checkbox"/>	10. The project site is located outside of a 100-year flood hazard zone? <i><b>[NOTE: If the charging equipment is located within a 100-year flood hazard zone, the ESS equipment shall be elevated above the base flood elevation. The base flood elevation must be determined and an elevation certificate submitted by a registered land surveyor. (Sonoma Municipal Code 14.25.160)]</b></i>
<b>Provided?</b>	<b>GENERAL 2019 CALIFORNIA CODE REQUIREMENTS (to be noted on plans as applicable)</b>
Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Sheet# _____	11. Show location and/or method of rapid shutdown initiation of the ESS, when integrated with a PV system (CEC 690.12) and the point of interconnection between the ESS and other power production sources.

Yes <input type="checkbox"/> No <input type="checkbox"/> Sheet# _____	12. Indicate that Energy Storage Systems (ESS) shall be listed and labeled for residential use in accordance with UL 9540. For exceptions, see CRC R327.2.
Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	13. Systems connected to the utility grid shall use inverters listed for utility interaction (i.e., UL 1741, or provided as part of the UL 9540 listing). (CRC R327.4)
Yes <input type="checkbox"/> No <input type="checkbox"/>	14. ESS shall be installed in accordance with the manufacturer’s installation instructions and their listings, if applicable, and shall not be installed within a habitable space of a dwelling. (CRC R327.3)
Yes <input type="checkbox"/> No <input type="checkbox"/>	15. All ESS equipment shall be listed by a Nationally Recognized Testing Laboratory (NRTL) either individually or as a complete, self-contained system according to a recognized standard. Provide supporting documentation that verifies certification of the equipment. (CEC 110.2)
Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Sheet# _____	16. For the ESS, include a note, on the plans, that a plug-in type back-fed circuit breakers connected to an interconnected supply shall be secured in in accordance with CEC 408.36(D).
Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Sheet# _____	17. Provide a permanent plaque or directory denoting all electric power sources operating in parallel with a primary power source on or in the premises, which shall be installed at the main service panel and at all locations of all electric power production sources capable of being interconnected. (CEC 705.10)
Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Sheet# _____	18. Where battery energy storage system input and output terminals are more than 5 ft from the connected equipment, or where these terminals pass through a wall or partition must comply with all of NEC 706.7(E)). <ul style="list-style-type: none"> <li>• A disconnecting means shall be provided at the energy storage system end of the circuit. Fused disconnecting means or circuit breakers shall be permitted to be used.</li> <li>• A second disconnecting means located at the connected equipment shall be installed where the disconnecting means required by 706.7(E)(1) is not within sight of the connected equipment.</li> <li>• Where fused disconnecting means are used, the line terminals of the disconnecting means shall be connected toward the energy storage system terminals.</li> <li>• Disconnecting means shall be permitted to be installed in energy storage system enclosures where explosive atmospheres can exist if listed for hazardous locations.</li> <li>• Where the disconnecting means in (1) is not within sight of the disconnecting means in (2), placards or directories shall be installed at the locations of all disconnecting means indicating the location of all other disconnecting means. (NEC 706.7(E))</li> </ul>
Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Sheet# _____	19. Where a disconnecting means, located in accordance with NEC 480.7(A) (out of sight of the battery storage system), is provided with remote controls to activate the disconnecting means and the controls for the disconnecting means are not located within sight of the stationary battery system, the disconnecting means shall be capable of being locked in the open position, (NEC 480.7(B)).

Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Sheet# _____	20. If trenching is required, a trenching detail is provided on the plans showing compliance with the minimum cover requirements pursuant to CEC 300.5? <b>[NOTE: trenching for electrical feeders from structure to structure must comply with CEC 225.]</b>
Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Sheet# _____	21. Physical protection such as a bollard is shown and detailed on the plans when vehicle impact protection for ESS equipment is required? (CEC 110.27 (B)) <b>[NOTE: Physical protection from damage is often a 4" diameter steel pipe filled with concrete, a minimum of 40" above the finished floor/grade, installed in a footing measuring 12" in diameter and 3' deep].</b>
Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Sheet# _____	22. If the ESS is installed within in a building containing an R (residential) occupancy, the plans show and specify the location for all required smoke and carbon monoxide alarms within the dwelling(s)? (CBC 907.2.10.2, CBC 915, CRC R314 and CRC R315) <b>[NOTE: In lieu of showing and specifying the location for all required smoke and carbon monoxide alarms within the dwelling(s), a <a href="#">Smoke &amp; CO Alarm Declaration and Installation Certification Form</a>, available on the City's web site, may be completed, signed and submitted with the application.]</b>
<b>Provided?</b>	<b>SIGNAGE (to be noted on plans as applicable)</b>
Yes <input type="checkbox"/> No <input type="checkbox"/>  Sheet# _____	23. The plans should indicate all required signage and the signage shall be in compliance with ANSI Z535 and should include the following information: <ul style="list-style-type: none"> <li>• Labeled "Energy Storage Systems" with symbol of lightning bolt in a triangle</li> <li>• Type of technology associated with the ESS</li> <li>• Special hazards associated with the EES (if applicable)</li> <li>• Type of suppression system installed in the area of the ESS (if applicable)</li> <li>• Emergency contact information (if applicable)</li> </ul>
Yes <input type="checkbox"/> No <input type="checkbox"/>  Sheet# _____	24. The plans should indicate that a permanent plaque or directory denoting all electric power sources operating in parallel with a primary power source on or in the premises, which shall be installed at the main service panel and at all locations of all electric power production sources capable of being interconnected. (CEC 705.10)
Yes <input type="checkbox"/> No <input type="checkbox"/>  Sheet# _____	25. The plans should indicate that a permanent plaque or directory denoting the location of all electric power source disconnecting means on or in the premises shall be installed at each service equipment location and at the location(s) of the system disconnect(s) for all electric power production sources capable of being interconnected. The marking shall comply with CEC 110.21(B) (CEC 706.11)
Yes <input type="checkbox"/> No <input type="checkbox"/>  Sheet# _____	26. The plans should indicate that equipment containing overcurrent devices in circuits supplying power to a busbar or conductors supplied from multiple sources shall be marked to indicate the presence of all sources. (CEC 705.12(B)(3))
Yes <input type="checkbox"/> No <input type="checkbox"/>  Sheet# _____	27. The plans should indicate that PV system output circuit conductors shall be marked to indicate the polarity where connected to battery energy storage systems. (CEC 690.55)
Yes <input type="checkbox"/> No <input type="checkbox"/>  Sheet# _____	28. The plans should indicate that DC system conductors of 4 AWG or larger shall be identified using colored marking tape, (CEC 210.5(C)(2))

Yes <input type="checkbox"/> No <input type="checkbox"/> Sheet# _____	29. The plans should indicate that where controls to activate the disconnecting means of a battery are not located within sight of a stationary battery system, the location of the controls shall be field marked on the disconnecting means. (CEC 480.7(B))
Yes <input type="checkbox"/> No <input type="checkbox"/> Sheet# _____	30. The plans should indicate that where controls to activate the disconnecting means of an ESS are not located within sight of the system, the disconnecting means shall be capable of being locked in the open position, in accordance with CEC 110.25, and the location of the controls shall be field marked on the disconnecting means. (CEC 706.7(B))
Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Sheet# _____	31. The sum of the ampere ratings of all overcurrent devices on panelboards, both load and supply devices, excluding the rating of the overcurrent device protecting the busbar, shall not exceed the ampacity of the busbar. The rating of the overcurrent device protecting the busbar shall not exceed the rating of the busbar. Permanent warning labels shall be applied to distribution equipment displaying the following or equivalent wording: (CEC 705.12(B)(2)(3)(c)): <p style="text-align: center;"><b>WARNING: THIS EQUIPMENT FED BY MULTIPLE SOURCES. TOTAL RATING OF ALL OVERCURRENT DEVICES, EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE, SHALL NOT EXCEED AMPACITY OF BUSBAR</b></p>
Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Sheet# _____	32. Where two sources, one a primary power source and the other another power source, are located at opposite ends of a busbar that contains loads, the sum of 125 percent of the power source(s) output circuit current and the rating of the overcurrent device protecting the busbar shall not exceed 120 percent of the ampacity of the busbar. The busbar shall be sized for the loads connected in accordance with Article 220. A permanent warning label shall be applied to the distribution equipment adjacent to the back-fed breaker from the power source that displays the following or equivalent wording: (CEC 705.12(B)(2)(3)(b)): <p style="text-align: center;"><b>WARNING: INVERTER OUTPUT CONNECTION; DO NOT RELOCATE THIS OVERCURRENT DEVICE.</b></p>
Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Sheet# _____	33. If a battery dc disconnecting means is not provided at the batteries, the disconnecting means shall be legibly marked in the field. The marking shall be of sufficient durability to withstand the environment involved and shall include the following (CEC 480.7(D)): <ul style="list-style-type: none"> <li>• Nominal battery voltage</li> <li>• Maximum available short-circuit current derived from the stationary battery system</li> <li>• Date the calculation was performed for the value above</li> <li>• The battery disconnecting means shall be marked in accordance with CEC 110.16</li> </ul>
Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Sheet# _____	34. Doors for designated stationary storage battery system rooms shall be provided with signage in accordance with CFC 1206.2.8.6.
Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Sheet# _____	35. Battery storage cabinets installed in occupied work centers shall be provided with signage pursuant to CFC 1206.2.8.6.2.



## 6. Plan Review

Permit applications must be submitted to the City of Sonoma Building Department in person at City Hall, #1 The Plaza, Sonoma, CA or electronically through e-mail. E-mail addresses are available under the Contact Numbers expandable box at <http://www.sonomacity.org/Government/Departmental-Offices/Building.aspx>.

Permit applications eligible for the expedited permitting process will receive a high priority and be reviewed as early as practical with a processing goal of one to three business days following receipt of the submittal.

## 7. Fees

An initial building permit deposit of \$100.00 must accompany all ESS permit applications at the time of submittal. The deposit will be applied towards the total cost of the building permit and is used to help cover initial processing, plan review and other applicable fees for service. The total cost for building permits for the installation of ESS permit is dependent on a number of factors but generally is in the range \$300 – \$400 for ESS systems with a capacity of less than 20 kWh and plans meeting the requirements of this checklist. Permit costs for ESS systems with a capacity of between 20 kWh and 50 kWh typically run in the range of \$800 - \$900.

## 8. Inspections

Once all permits to construct the ESS have been issued and the system has been installed, it must be inspected before final approval is granted for the ESS.

- Fire Department Inspections. When required, fire department inspection may be scheduled by calling the Sonoma Valley Fire & Rescue Authority at 707-996-2102.
- On-site electrical inspections can be scheduled by contacting the City of Sonoma Building Department by telephone at 707-938-3681. Inspection requests received during City Hall business hours can usually be scheduled for the next business day.

Permit holders must provide the inspector with the Building Department Approved Job Plans, the Building Permit Inspection Record Card and access to the location of the work. The permittee must be prepared to show conformance with all technical requirements in the field at the time of inspection. The inspector will verify that the installation is in conformance with applicable code requirements and the approved plans.

## 9. Departmental Contact Information

For additional information regarding this permit process, please consult our departmental website at <http://www.sonomacity.org/Government/Departmental-Offices/Building.aspx> or contact the Building Department at 707-938-3681.