

**Seattle Fire Marshal's Office**

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seattle.gov/fire

**CONSTRUCTION-RELATED
PERMIT AND SUBMITTAL
CHECKLIST FOR ENERGY
STORAGE SYSTEMS**

This checklist document guides the applicant through the Seattle Fire Department plan review, permitting and inspection process. This checklist document does not need to be submitted to SFD or SDCI. We encourage you to use it as an important reference to help you navigate the process successfully.

SECTION 1: CODE AND PERMIT REQUIREMENTS

A fire code installation permit (6401-Install) is required to install an Energy Storage System in a building or indoor or outdoor space when energy capacity values exceed what is shown in SFC Table 1207.1.3 (below). ESS systems also require a building code construction permit and electrical permit from SDCI.

**SEATTLE FIRE CODE TABLE 1207.1.3 –
ENERGY STORAGE SYSTEM (ESS) THRESHOLD QUANTITIES**

TECHNOLOGY	ENERGY CAPACITY ^a
Capacitor ESS	3 kWh
Flow batteries ^b	20 kWh
Lead-acid batteries, all types	70 kWh ^c
Lithium-ion batteries	20 kWh
Sodium nickel chloride batteries	70 kWh
Nickel-cadmium batteries (Ni-Cd), Nickel Metal Hydride (Ni-MH), and Nickel Zinc (Ni-Zn) batteries	70 kWh
Non-electrochemical ESS ^d	70 kWh
Other battery technologies	10 kWh
Other electrochemical ESS technologies	3 kWh
Zinc manganese dioxide batteries (Zn-MnO ₂)	70 kWh

For SI: 1 kilowatt hour = 3.6 megajoules.

a. Energy capacity is the total energy capable of being stored (nameplate rating), not the usable energy rating. **For units rated in amp-hours, kWh shall equal rated voltage times amp-hour rating divided by 1,000.**

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

c. Fifty gallons of lead-acid battery electrolyte shall be considered equivalent to 70 kWh.

d. Covers non-electrochemical technologies such as flywheel and thermal ESS.

SECTION 2: APPLICANT INFORMATION

Contact Name: _____ Request Date: _____ Mailing Address: _____

Company name: _____

Relationship to Project:

☐ Owner ☐ Design Professional ☐ Contractor

Phone Number: _____ Email: _____

☐ Other _____

SECTION 3: PROJECT INFORMATION

Project Address: _____

Project Name / Tenant: _____

Property Owner: _____

City Permit Number: _____

SECTION 4: DESCRIPTION OF WORK**SECTION 5: CONTRACTOR INFORMATION**

Contractor Name: _____ Mailing Address: _____
Contact Person: _____
State Contractors License #: _____
Expiration Date: _____ Phone Number: _____ Email: _____
Contractor License #: _____

SECTION 6: TYPE OF ENERGY STORAGE SYSTEM

Technology and energy capacity (per Table 1207.1.3) of each system. If unknown, design for most restrictive type.

<input type="checkbox"/> Flow batteries	_____ kWh	<input type="checkbox"/> Ni-Cd, Ni-MH, Ni-Zn	_____ kWh
<input type="checkbox"/> Capacitor ESS	_____ kWh	<input type="checkbox"/> Lithium-Ion	_____ kWh
<input type="checkbox"/> Lead acid (all types)	_____ kWh	<input type="checkbox"/> Non-electrochemical ESS	_____ kWh
<input type="checkbox"/> Sodium nickel chloride	_____ kWh	<input type="checkbox"/> Zinc manganese dioxide batteries	_____ kWh
<input type="checkbox"/> Other electrochemical ESS	_____ kWh	<input type="checkbox"/> Other battery technologies	_____ kWh

SECTION 7: SUBMITTAL STANDARDS**ELECTRONIC PLAN STANDARDS**

See SFD [Client Assistance Memorandum #5002](#) "Electronic File Standards: Shop Drawings"

File Naming Standards

Electronic plans and documents shall be named with a clear title. For example, the Site Plan for ESS Submittal should be called "Site Plan for ESS Submittal 1234 Main St" and the commissioning documents including pretest documentation for the installed ESS should be called "Commissioning Documents for ESS Plan 1234 Main St".

SECTION 8: SUBMITTAL CHECKLIST FOR THE CONSTRUCTION PERMIT

The following information must be uploaded to the -CN permit or -CN amendment related to your ESS project. This information will be reviewed by the SFD Plan Review team and SFD Inspector.

- ☐ **Site Plan.** Will there be outdoor installations? If so, show how you are meeting SFC Sections 1207.8.1 through 1207.8.3.
 - ☐ **Plans.** Location and layout diagram of the room in which the stationary Energy Storage System is to be installed. All information specified under 2021 SFC Section 1207.1.5 shall be provided on construction documents. Battery spacing clearly denoted on plan.
- Plans should address:**
- ☐ The weight of each ESS.
 - ☐ Rack storage arrangement, including Seismic and Structural Design SFC Section 1207.4.4.
 - ☐ Location and layout diagram of the room or area in which the ESS is to be installed.
 - ☐ Details on the hourly fire-resistance ratings of assemblies enclosing the ESS.
 - ☐ Details on fire suppression, smoke or fire detection, thermal management, ventilation, exhaust, spill control, and deflagration venting systems, if provided.
 - ☐ Location of required electrical disconnects per SFC Section 1207.4.1 and NFPA 70.
 - ☐ The quantities and types of ESS to be installed.

- ☐ Manufacturer's specifications, ratings, and listings of each ESS per SFC Table 1207.1.3.
- ☐ Description of energy (battery) management systems and their operation.
- ☐ A commissioning plan complying with SFC Section 1207.2.1.
- ☐ A decommissioning plan complying with SFC Section 1207.2.3.
- ☐ A fire safety and evacuation plan in accordance with Section 404.
- ☐ Location and content of all required signage.
- ☐ Are there fire areas that exceed Maximum Allowable Quantities (MAQ) per SFC Table 1207.5? If yes, a Hazard Mitigation Analysis is required. Refer to Section 9.
- ☐ The installer or installer's representative **must also apply for SFD Energy Storage System installation permit** (code 6401-Install). This is done directly with SFD and is not in the Seattle Services portal. The required SFD inspection for the ESS on the -CN record will not be provided until the 6401-Install permit application is received by SFD.

SECTION 9: HAZARD MITIGATION ANALYSIS FOR PROJECTS THAT EXCEED FIRE CODE MAXIMUM ALLOWABLE QUANTITIES (MAQ'S)

Fire areas within buildings containing Energy Storage systems exceeding the maximum allowable quantities in Table 1207.5 shall be permitted based on a hazardous mitigation analysis (HMA) in accordance with Section 1207.1.6 and large-scale fire testing complying with Section 1207.1.7, when approved by the fire code official. If required, the HMA must be submitted on the CN permit no later than the time you are requesting the ESS project's EL permit review.

Exceptions:

1. Lead-acid and nickel-cadmium battery systems installed in facilities under the exclusive control of communications utilities, and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76.
 2. Dedicated-use buildings in compliance with Section 1207.7.1.
- ☐ **This project exceeds MAQs and requires a hazard mitigation analysis.** A failure modes and effects analysis (FMEA) or other approved hazard mitigation analysis shall be provided in accordance with SFC Section 104.8.2 under any of the following conditions:
1. Where ESS technologies not specifically identified in SFC Table 1207.1.3 are provided.
 2. More than one ESS technology is provided in a single fire area where there is a potential for adverse interaction between technologies.
 3. Where allowed as a basis for increasing maximum allowable quantities in accordance with SFC Section 1207.5.2.
 4. Where flammable gases can be produced under abnormal conditions.
 5. Where required by SFD to address a potential hazard with an ESS installation that is not addressed by existing requirements.

SECTION 10: INFORMATION REQUIRED TO BE SUBMITTED WITH THE APPLICATION FOR EL PERMIT

- ☐ Please contact for SDCI for information on what is required to be submitted for the electrical permit.

SECTION 11: FINAL INSPECTION CHECKLIST

Process Information The SFD Special Hazards Unit inspector will sign off on the -CN permit related to ESS permit. The same inspector will also sign off on your SFC 6401-Install permit.

Commissioning Report is Mandatory A commissioning report must be uploaded to the -CN permit in Accela with a hard copy on site for the SFD inspector at the time of the SFD ESS inspection. The commissioning report must include verification of the following items:

- ☐ Fire Detection in ESS area shall be tested and inspected (by permit).
- ☐ Fire Suppression System shall have been tested and inspected (by permit).
- ☐ Gas Detection system (if installed) shall be tested and inspected.

- ☐ Exhaust Ventilation System (where required) shall be operational, per approved design. Documentation shall be onsite. Must be supervised by the fire alarm.
- ☐ Any system that connects to the fire alarm system must be connected to the fire alarm system for an SFD-certification technician holding a current FA-1 certification. Fire suppression systems can only be installed by an SFD certified technician holding an E and/or an AS-1 certification card. Please include certification holder name and certification card number in the commissioning document if applicable.

SFD Special Hazards Unit ESS Inspection Checklist:

- ☐ Battery spacing per floor plan.
- ☐ Electrical shut-off per plan.
- ☐ Fire safety plan per 1207.1.5.
- ☐ Copy of final commissioning report per 1207.2.1.2 and operations and maintenance manual.
- ☐ Proper signage near fire alarm panel and on doorway to equipment.
- ☐ Where the ESS disconnecting means is not within sight of the main electrical service disconnecting means, placards or directories shall be installed at the location of the main electrical service disconnecting means indicating the location of the stationary storage battery system disconnecting means.
- ☐ Floor plan posted near fire alarm control panel.
- ☐ Spill control and neutralization (if required) is in place. [SHU – also check for other features required in Table 1207.6]
- ☐ Fire Alarm System Monitoring. The commissioning report shall document successful installation and pretesting of the following items.
 - ☐ Fire detection shall be connected to the Building FACP for Alarm, Trouble, Supervisory signals.
 - ☐ If a Gas Detection System is required, it shall be monitored by the Building Fire Alarm System.
 - ☐ Is there an Energy Management System required for this site? If so, then the required alarm signals per system design and code shall be transmitted to an approved location. The system shall transmit an alarm signal to an approved location if potentially hazardous temperatures or other conditions such as short circuits, over voltage or under voltage are detected.
 - ☐ The ventilation system shall report to monitoring unless there is an onsite 24/7 personnel.
 - ☐ Alarm signals confirmed with central station.
- ☐ Approved signs shall be provided on or adjacent to all entry doors for ESS rooms or areas and on enclosures of ESS cabinets and walk-in units located outdoors, on rooftops or in open parking garages. Signs designed to meet both the requirements of this section and NFPA 70 shall be permitted. The signage shall include the following or equivalent:
 1. “ENERGY STORAGE SYSTEM,” “BATTERY STORAGE SYSTEM,” “CAPACITOR ENERGY STORAGE SYSTEM”, or the equivalent.
 2. The identification of the electrochemical ESS technology present.
 3. “ENERGIZED ELECTRICAL CIRCUITS.”
 4. Where water-reactive electrochemical ESS are present, the signage shall include “APPLY NO WATER.”
 5. Current contact information, including phone number, for personnel authorized to service the equipment and for fire mitigation personnel required by SFC Section 1207.1.8.1.