



# Energy Storage System (ESS) Equipment Approval and Installation Guide

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New York City Fire Code Section 608 sets forth the requirements for Energy Storage Systems (ESS) for all indoor and outdoor use in New York City. The 2022 NYC Fire Code Section [608](#), New York City Fire Department (FDNY) Rule [3 RCNY Section 608-01](#) and the Department of Buildings (DOB) [Codes](#) and [Rules](#) shall be followed for the design, installation, operation and maintenance of Energy storage systems.

## **Overview**

The stationary ESS approval process consists of the following three steps:

1. **Product Review and Approval - Certificate of Approval (COA):** The submission of documents, FDNY technology review, and product approval of each individual ESS unit.
2. **Plan Review and Installation Approval:** The submission of documents, FDNY review, and installation approval for specific sites in accordance with applicable codes and standards.
3. **FDNY Filings:** Applications must be submitted via The FDNY Business Portal for all filings mentioned in this document.
4. **Installation Inspections and Operating Permit:**
  - a. All Indoor ESS systems must be inspected and permitted by FDNY.
  - b. Outdoor systems with an aggregate capacity greater than 20 kWh must be inspected and permitted by FDNY.

**Note:** All indoor and Outdoor ESS systems require approval and work permit from DOB.



# 1. Product Review and Approval – Certificate of Approval (COA)

## **Background**

All battery ESS for stationary installations and mobile systems shall require a product specific approval from the FDNY. This approval document is called a Certificate of Approval (COA). To obtain a COA, the applicant (i.e. a battery unit manufacturer or their authorized agent) must submit a FDNY application form titled [TM-2](#) for FDNY review and approval of the product via [The FDNY Business Portal](#). The application type should be "Certificate of Approval".

## **Documents Required**

The TM-2 application must be accompanied by all required documents mentioned in the TM-2 application form, including the following:

1. The complete Nationally Recognized Testing Laboratory (NRTL) product and test report based on the following UL standards:
  - a. **UL 1741:** Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources
  - b. **UL 1973:** Batteries for Use in Light Electric Rail (LER) Applications and Stationary Applications
  - c. **UL 9540:** Energy Storage Systems and Equipment
2. Full-scale testing report based on **UL 9540A** (Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems) test method, consistent with the UL 9540A test method test report recording requirements.
3. Hazard Mitigation Analysis (HMA) report and the recommended mitigation measures prepared by a New York State (NYS) [Registered Architect](#) or [Professional Engineer](#).
4. A description of the battery technology/chemistry, modes of operation, incorporated safety systems and activation sequences.
5. Manufacturer/product specific documents such as installation & operational manuals, Safety Data Sheets (SDS), emergency management/response plan, etc.
6. Maximum energy capacity of each unit/product listed or certified to the UL 9540 standard.
7. A clear notation of whether the product is listed or certified for outdoor, indoor or roof mounted installation.
8. A detailed description of the ESS remote monitoring capability and technology, including the remote monitoring facility, if any.
9. Type of application/use of the ESS/battery unit, such as: grid support, building power, emergency power, Uninterruptible Power Supply (UPS), etc.

## **Possible Outcomes**

The TM-2 application and all submitted documents/materials will be reviewed by the Technology Management (TM) unit within the Bureau of Fire Prevention (BFP). The TM plan examiner will issue one of the following responses via documentation to the applicant:

1. **Certificate of Approval (COA)**: If the application meets all applicable NYC requirements, a Citywide COA will be issued authorizing the use of the product throughout New York City.
2. **Letter of Deficiency (LOD)**: If the application does not meet all applicable NYC requirements, and/or additional information is needed/requested, a LOD will be issued.



3. Letter of Denial (LOD): If the application does not meet all applicable NYC requirements, and/or it is determined that the product chemistry, test report, and/or test results are not sufficiently safe for deployment in NYC, a Letter of Denial (LOD) will be issued denying the product.

**Notes:**

- Stationary ESS with an individual size of 2 kWh or less for outdoor use do not require a COA. See [here](#) for current list of ESS that have been issued a COA. The list is updated by TM and can be found on [nyc.gov/FDNY](https://nyc.gov/FDNY) → Business → All Certifications → [Get Certificates of Approval](#).
- For any questions/concerns, please contact [FDNY.Businesssupport@FDNY.nyc.gov](mailto:FDNY.Businesssupport@FDNY.nyc.gov).



## 2. Plan Review and Installation Approval

A site-specific plan approval is required for each ESS installation from FDNY and/or DOB depending on the energy capacity/size of the installation and the location (indoor/outdoor) of the installation. All ESS must have a COA issued by FDNY to be considered for plan review and installation approval. Additionally, a DOB construction work permit shall be required for each stationary ESS installation of any capacity/size. The aggregate rated energy capacity per control area of indoor systems shall not exceed the limitations set forth in Fire Code FC Table 608.9.1.1. The design and number of control areas are set forth in FC Table 5003.8.3.3.

### Notes:

- All fire protection systems (e.g. fire alarm, emergency alarm, gas detection system, non-water (alternative) fire extinguishing systems, etc.) where required by the Fire Code, FDNY rules, Building Code or DOB rules, or as a condition of the COA must be submitted to FDNY for review and approval (DOB review is not required for such systems except as otherwise specifically indicated in this document). Fire protection systems will be subject to **inspection and testing**, as per FDNY requirements once the installation is complete.
- Additional TM-1 applications may be required to be filed, reviewed, and approved by the FDNY if conditions (i.e. non-fire code compliant fire apparatus access roads and rooftop access) warrant such review. For fire apparatus access roads, file TM-1 and the application type should be "Engineering Application". For rooftop access, file TM-5 and the application type should be "Rooftop Access Variance."

### Indoor Installations

1. All applications for indoor installations shall follow DOB procedures. NFPA 15 water spray systems for indoor installations must be approved by DOB. Please refer to DOB's website for complete guidance.
2. Indoor installations are not subject to FDNY TM-1 mechanical plan review unless the installation of the battery unit is not in compliance with the terms and conditions of the COA. See Section 3 for additional information on TM-1 filings (if required).

### Outdoor Installations

1. Applications for plan review of ESS for small and medium systems (as set forth in Table 1 of the Fire Department rule [3RCNY 608-01](#)) shall be submitted to DOB for review and approval. Please note that FDNY plan review is not required for these two capacities/sizes if they have obtained a COA.
2. Applications for plan review of ESS for large systems (as set forth in Table 1 of the Fire Department rule [3RCNY Section 608-01](#)) shall be subject to both FDNY and DOB plan reviews.

### Notes:

- For any FDNY related questions/concerns, please contact [FDNY.Businesssupport@FDNY.nyc.gov](mailto:FDNY.Businesssupport@FDNY.nyc.gov).
- See DOB's Office of Technology Certification and Research (OTCR) resources page [here](#).



## 3. FDNY Filings

### **3.A TM-1 Engineering Plan Review for Installations (Mechanical) of ESS**

Plan review of site specific installations (where required as stated above) shall be submitted to [FDNY TM via the FDNY Business portal](#). The application type should be "Engineering Application." Plans will be reviewed for applicable Fire Code requirements.

#### **Documents Required**

The TM-1 application must be accompanied by all required documents mentioned in the TM-1 application form, including the following:

1. Plans/drawings signed and sealed by a NYS Registered Design Professional showing the proposed location of BESS installation.
2. Additional drawings such as 100 & 250-foot radii site plans, fire alarm, fire protection plans, etc.
3. Narrative of the scope of work including pictures of the proposed site.
4. Installation, operation, maintenance manuals, technical documentations, etc.
5. Commissioning and decommissioning plans
6. Emergency Management Plan
7. Site-specific Hazard Mitigation Analysis (HMA), signed and sealed by a NYS Registered Design Professional
8. Other pertinent information (copy of COA, signage, flood zone map, certificate of occupancy, DEP letter for hydrant flow test, UL listing/certificate, etc. as applicable)
9. Information on the Certificate of Fitness (COF) holder, Subject Matter Expert (SME) and remote monitoring facility, etc.
10. Fencing to ensure the site complies with NYC noise requirements, if applicable.

#### **Possible Outcomes**

The TM-1 application and all supporting documents will be reviewed by TM. The TM plan examiner will issue one of the following responses to the applicant:

1. Conditional Letter of Acceptance (CLOA): If plans are deemed acceptable, a CLOA will be issued.
2. Letter of Deficiency (LOD): If plans are not deemed acceptable, a LOD will be issued.
3. Letter of Denial (LOD): If the site does not meet all applicable NYC requirements, and/or it is determined that the site is unsafe, a Letter of Denial (LOD) will be issued denying the installation.

Upon receipt of a FDNY CLOA for plan review and installation, the applicant shall file a plan review and installation application with the DOB.

**Note:** When filing for an amendment to an approved TM-1 application, the applicant must submit copies of all supporting documents originally approved/submitted and an updated narrative indicating all proposed revisions including changes to registered professionals, license holders and monitoring facilities.

### **3.B Fire Alarm Plan Review (Including Emergency Alarm or Gas Detection System) Associated with ESS**

Fire alarm applications associated with ESS (where required) must be submitted to the Fire Alarm Plan Examination Unit within the BFP for review. The job description for the system shall indicate the type of protection, as well as the types of initiating devices activating the system. It shall indicate that it is for an



ESS as well as state the power capacity of the installation. A TM-1 form shall be completed by a NYS Registered Design Professional (NYS Registered Architect or Professional Engineer).

General guidance for filing a fire alarm application may be found in the following link: [tips-fire-alarm-systems.pdf](#)

In addition to the general requirements for fire alarm applications, the following shall also be noted when designing fire alarm systems for ESS installations:

1. Specification sheets for the proposed control units (panels)/devices featured in the proposed fire alarm system design. Fire alarm control units utilized must have a COA for use in NYC.
  - a. Outdoor installations will require fire alarm devices to be listed and designed for use in outdoor locations, specifically for weather rating and operating temperatures, as listed by the manufacturer.
  - b. A radiant energy sensing fire detection system may be required for all roof mounted and large outdoor ESS systems.
2. Mechanical approval for non-water based/water-spray suppression systems, which may be monitored/connected to the fire alarm system, shall be obtained from TM.
3. For job sites that are not under the jurisdiction of the DOB for permitting of use and occupancy, the Authority Having Jurisdiction (AHJ) that precedes over the job site shall provide an equivalent "Letter of No Objection/Verification" for the address and occupancy use of the site.
4. Fire alarm systems that serve ESS shall be provided with descriptive contact I.D. that identifies the coverage to be for an "Energy Storage System" to the central monitoring station.

When submitting an application, a CLOA for the ESS installation, or other documents such as a COA shall be provided as part of the supporting documents.

Once the fire alarm plans are approved, a **project authorization** shall be requested to begin the work. Once the project authorization is granted, an 8-digit record ID is generated which will be used for the on-site inspection. Utilize this number when the installation is complete, and while scheduling the inspection. Before requesting an inspection, confirm the installation is finalized and pre-tested. Failure to do so will result in violations and delays in the final approval.

### **3.C TM-1 Plan for the NFPA 15 Suppression System for ESS (Outdoor Only)**

#### **NFPA 15 Water Spray Fire Extinguishing System**

1. Submit a [TM-1 for plan review](#) with all required documents. The application type should be "Engineering Application".
2. The system shall be installed, positioned, and designed to provide a minimum density of 0.5 gpm/ft<sup>2</sup> over the entire surface area of the protected ESS containers.
3. Arrange the system to be zoned such that water flow will not exceed 1,000 gpm in each zone.
4. Upon satisfactory review, a CLOA will be issued.

### **3.D Additional Plans that May be Required for ESS**

Depending on the site and equipment, the following plans may be required to be submitted to FDNY for review and approval:

1. Non-Water Based (Alternative) Fire Extinguishing Systems (If installed)
  - a. Submit a separate/additional [TM-1 for plan review](#) with all required documents. The application type should be "Engineering Application".
  - b. Select "Non-water fire extinguishing systems (FC904)" category.
  - c. Upon satisfactory review, a Letter of Acceptance (LOA) will be issued.
2. Fire Apparatus Access (if not in compliance with FC 503)



- a. A [TM-1 for plan review](#) shall be submitted to FDNY for review and approval (The application will be reviewed and approved by the FDNY City Planning Unit). The application type should be "Engineering Application."
  - b. Upon satisfactory review, a LOA will be issued.
3. Rooftop Access Variance (if not in compliance with FC 504)
  - a. A [TM-5](#) shall be submitted to TM via [The FDNY Business Portal](#).
  - b. Upon satisfactory review, a LOA will be issued.
4. Fire Hydrant Location
  - a. Fire hydrants that are located more than 100 ft but less than 125 ft from Fire Department Connections (FDCs) must submit a [TM-1 for document review](#) to FDNY for review and approval. The application type should be "Engineering Application."
  - b. Upon satisfactory review, a Letter of No Objection (LNO) will be issued.
5. New Private Hydrant
  - a. For new private fire hydrants, a [TM-1 for plan review](#) shall be submitted to FDNY for review and approval (The application will be reviewed and approved by the FDNY City Planning Unit). The application type should be "Engineering Application".
  - b. Upon satisfactory review, a LOA will be issued.

**Note:**

1. For any fire alarm questions/concerns, please contact [FDNY.Businesssupport@FDNY.nyc.gov](mailto:FDNY.Businesssupport@FDNY.nyc.gov) "ATTN FAIU."
2. For all other questions/concerns, please contact [FDNY.Businesssupport@FDNY.nyc.gov](mailto:FDNY.Businesssupport@FDNY.nyc.gov) and/or [Tech.mgt@fdny.nyc.gov](mailto:Tech.mgt@fdny.nyc.gov).



## 4. Installation Inspections and Operating Permit

Please visit the [inspection page](#) of the FDNY to see the comprehensive [list of documents and applicant requirements by inspection type](#).

Upon successful installation of the ESS as per approved plans, a permit must be obtained for all systems exceeding 20 kWh aggregate capacity on premises by submitting a request [for FDNY Final Emergency Shutdown Test \(ESDT\)/Permit Inspection](#) as detailed below. Prior to requesting a Final ESDT/Permit Inspection, all required fire alarm, emergency alarm, detection system and non-water based (alternative) fire extinguishing systems shall be tested and have obtained a LOA for each such system from respective FDNY inspection units.

### **Exceptions for FDNY Installation Inspection and Operating Permit**

1. An FDNY permit is not required for any [outdoor system](#) with an aggregate capacity of 20 kWh or less.
2. An FDNY permit is not required for any residential system serving Group R-3 (one and two family) occupancy.

### **4.A Fire/Emergency/Gas Detection System Inspection**

**Unit:** Fire Alarm Inspection Unit (FAIU)

Requests for initial fire alarm inspections are to be submitted in person at FDNY headquarters located at 9 Metrotech Center, Brooklyn NY 11201 (use Flatbush Avenue entrance) on Tuesdays and Thursdays from 9AM to 12PM. Information on who can request the inspection as well as a list of required documents including the B45 Form, the A433C Form, Project Authorization and Approved Plans can be found on the [Request an Inspection](#) page on the FDNY website. Once submitted, an email listing the inspection date and time will be sent to the applicant. All contractors shall be on site to perform the inspection.

### **Possible Outcomes/Result of Inspection**

1. **Letter of Approval (LOA):** When the fire alarm system is installed in accordance with all applicable codes, and free of all defects, a LOA for the system is issued.
2. **Notice of Defect (NOD):** If defects are found during the inspection process, a NOD or violation order is issued.
  - a. These defects will need to be corrected. Depending on the severity of the defects, a re-test and/or submission of an amended plan may be required. If an amended plan is required, it must be submitted to the Fire Alarm Plan Examination Unit for review. Minor defects may be subject to professional certification, if desired. This will be noted on the notice of defect. Information on this process can also be found on the [Request an Inspection](#) website.
3. **Re-test:** If a re-test is to be conducted, the inspection request must be submitted through the FDNY business portal:
  - a. Go to FDNY Business [Accela Citizen Access](#) and Login.
  - b. Navigate to: Begin Application/Request → Public Request → Public Request for Inspections.
  - c. Follow the inspection instruction manual found on the [Request an Inspection](#) on how to submit a request for inspection through FDNY Business - Accela Citizen Access.

**Note:** For any questions/concerns, contact [FDNY.Businesssupport@FDNY.nyc.gov](mailto:FDNY.Businesssupport@FDNY.nyc.gov) "ATTN FAIU."





## **4.B NFPA 15 Suppression System for ESS Inspection**

**Unit:** Rangehood Unit

**Note:** Hydrostatic testing can only be conducted in non-freezing temperatures. The testing may take up to three hours.

### **Pre-Scheduling**

1. Project Authorization
  - a. A project authorization shall be requested from the FDNY Technology Management Unit.
  - b. Upon issuing the project authorization, a record ID number will be provided. This record ID will be used for the on-site inspection.

### **Scheduling**

1. Initial Email
  - a. Send an email to [Rangehood\\_Unit@fdny.nyc.gov](mailto:Rangehood_Unit@fdny.nyc.gov) with the FDNY approved plan and a filled out B45 Inspection request form attached.
  - b. Request a date to check for availability.
2. Online Scheduling
  - a. Go to **FDNY Business**.
  - b. Navigate to: Begin Application/Request → Public Request → Public Request for Inspections.
  - c. Fill in the address.
  - d. Fill out the Permit/LOA Contact and Billing Contact.
  - e. In the Inspection Request Details section:
    - i. Add a row.
    - ii. Select "Rangehood".
    - iii. For "Alternate Agent Test", select the type of system and test date.
    - iv. Continue filling out the form until you receive a request number (e.g., 2024-INSP-Request-040444).

### **Inspection**

1. Preparation
  - a. Ensure the contact listed on the B45 form and the inspection request is on-site on the day of the inspection.
  - b. S-12 or S-15 COF holder must be present.
  - c. Present documentation, such as an affidavit, from the manufacturer stating that the nozzle is capable of outdoor use.

### **Possible Outcomes/Result of Inspection**

The contractor will be notified whether the test has passed or failed upon completion of the inspection.

1. Letter of Approval (LOA): Upon passing the inspection, a LOA will be issued within three business days to the applicant on record. The contractor can also obtain the LOA through their NYC account using the record ID number provided when the project authorization was issued.
2. Letter of Defect (LOD):
  - a. The contractor will receive an email with an attached LOD, listing all the issues that need to be fixed.
  - b. Re-testing, re-inspection, or an amended plan will be required.



- i. For re-testing or re-inspection, the contractor may start the scheduling process again once the issues are fixed.
- ii. If an amended plan is required, it must be submitted to the FDNY TM unit for plan review.

#### **4.C Aerosol Fire Suppression System for ESS Inspection**

**Unit:** Rangehood Unit

Rangehood inspections of aerosol fire suppression systems will follow the same procedures mentioned above with the exception that it can be done all year long.

**Note:** For any rangehood questions/concerns, contact [FDNY.Businesssupport@FDNY.nyc.gov](mailto:FDNY.Businesssupport@FDNY.nyc.gov).

#### **4.D Final Inspections**

**Unit:** Bulk Fuel Safety Unit (BFSU)

You may contact the Bulk Fuel Safety Unit (BFSU -Hazard Control Inspection Group) at [BFSU@fdny.nyc.gov](mailto:BFSU@fdny.nyc.gov) or at 718-999-2461/2463 to request the Pre-commissioning (optional), Commissioning, Final Emergency Shutdown Test, and Post- commissioning. An ESS commissioning plan and Emergency Management Plan (EMP) shall be submitted at the time when requesting the Final Emergency Shutdown Test/Permit Inspection (see below for a breakdown of each inspection). An inspection may not be granted until such documents are submitted. Additionally, applicants must also officially schedule an inspection via the **FDNY Business Portal** to obtain an inspection request ID number.

The owner(s), installer, SME, fire alarm technician holding a COF ([S97/S98](#)), and [B-28](#) Certificate of Fitness (COF) holder responsible for the installation of the ESS shall be present at the time of Final Emergency Shutdown Test/Permit inspection, and the following shall be made available at the inspection site by the owner:

1. DOB work permit
2. Approved plans
3. As-built plans/drawings as applicable
4. Information and documentation about the remote monitoring facility staffed by trained and knowledgeable person(s) retained by the manufacturer or installer of the battery system
5. All approvals for the fire protection systems
6. Copy of the COA for the ESS
7. FDNY or DOB variance approvals, if any
8. All required signs posted
9. A decommissioning plan
10. A maintenance plan
11. Site-specific EMP
12. Familiarization drills must also be performed with Hazmat and the local fire house.

**Note:** The CLOA requires a notification of the commissioning and decommissioning of stationary storage battery systems to be given to the local fire company and HazMat Operations for their familiarization with the system, its operation, the safety systems incorporated, and actions to take in case of emergency according to the emergency management plan. The notification shall be promptly sent to [Hazmat.EmergingTech@fdny.nyc.gov](mailto:Hazmat.EmergingTech@fdny.nyc.gov) "ATTN Familiarization Drill" to set up the drills.



### **Possible Outcomes**

Upon successful inspection, a LOA and a site permit (valid for one year) will be issued to operate the system.

If the inspection has failed due to an administrative issue, a violation order is issued. Applicant may submit corrections/amendments via email ([BFSU@fdny.nyc.gov](mailto:BFSU@fdny.nyc.gov)) to resolve deficiencies.

If the inspection has failed due to other reasons such as missing equipment or mechanical issue, a violation order is issued. Applicants must request a reinspection/retest via FDNY Business Support or via email at [BFSU@fdny.nyc.gov](mailto:BFSU@fdny.nyc.gov).

**Note:** OTCR Final acceptance letter may be required prior to the FDNY permit renewal.

## **4.E Additional Information on BFSU Inspections**

### **Pre-Commissioning Inspection (Optional)**

The pre-commissioning inspection may be conducted by the Bulk Fuel Safety Unit (BFSU) following the installation of the ESS, including fire protection systems such as the fire alarm system, fire suppression system (e.g., water-based deluge system), and Fire Department Connection (FDC). During this inspection, BFSU will meet with the owner or owner's representative, the Certificate of Fitness (COF) B28 holder, and the designated Subject Matter Expert (SME) to review documentation, inspection, and test requirements. These requirements are outlined in the Technology Management (TM) unit Letter of Approval/Acceptance (LOA), Fire Code, Fire Rule, and the relevant NFPA standards.

### **Commissioning Inspection**

The commissioning inspection is conducted by BFSU after FAIU completes satisfactory testing of the fire alarm system, and the Rangehood Unit (RHU) completes testing of the suppression system and fire department connections. This inspection includes the emergency shutdown test of the BESS, which involves activating the emergency shutdown switch/button, fire alarm and detection devices (E.g., fire detectors, UV detectors), and manual pull stations to verify the transmission of alarm signals to the BESS remote monitoring station or approved central station as applicable. It also involves testing emergency telephone numbers displayed on required signage.

**BFSU** will require the presence of the owner or representative, B28 COF holder, SME, remote monitoring station representative, and fire alarm technician holding a FDNY's COF(S97/S98) during the inspection. After successful commissioning testing and inspection, BFSU will issue a LOA and permit.

### **Post-Commissioning Inspection**

The post-commissioning inspection may be conducted by BFSU at any time after the successful completion of the commissioning inspection. This inspection is aimed at monitoring the performance of the ESS and verifying established inspection and maintenance records.

### **Annual Permit Inspection**

The annual permit inspection will be conducted by BFSU on or before the expiration date of the ESS permit. This inspection will repeat the procedures performed during the commissioning and post-commissioning inspections to ensure ongoing compliance and performance of the system. If there is a change in the BESS remote monitoring company, a test of the ESD shall be conducted to verify transmission of signals to the new remote monitoring station at the time of the permit renewal.

**Note:** For any BFSU questions/concerns contact [FDNY.Businesssupport@FDNY.nyc.gov](mailto:FDNY.Businesssupport@FDNY.nyc.gov) and/or [BFSU@fdny.nyc.gov](mailto:BFSU@fdny.nyc.gov).