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Joint Memorandum

To: Building Inspectors and Fire Prevention Officers

From: Layla D'Emilia, Commissioner, Division of Professional Licensure

Peter Ostroskey, State Fire Marshal, Department of Fire Services

Date: May 21, 2021

Re: **Guidance for Energy Storage System (ESS) installation in One- and Two-Family Dwellings**

The advancement in stationary battery storage of electrical power generated by photovoltaic systems has outpaced prescriptive requirements in the current State Building Code (780 CMR). As a result of receiving many inquiries from municipal Building and Fire Officials about how 780 CMR and 527 CMR 1.00 handle Energy Storage Systems (ESS), this guidance has been created to provide a code path to permitting ESS for one- and two-family dwellings. This guidance delivers consistency with issuing building, fire and electrical permits for ESS and some construction requirements providing minimum safeguards for the occupants of one- and two-family dwelling structures. Although the 9th Edition of 780 CMR does not specifically address ESS installations, Section R104.12 – “Matters Not Provided For” gives building officials the authority to address these new technologies. Also, for Fire Officials, 527 CMR 1.00: 1.4 allows for alternative designs within 527 CMR 1.00. Plans for such installations must be submitted to Building, Fire and Electrical Inspector/ Officials for review and approval in accordance with 780 CMR R104.12, 527 CMR 1.00:1.4, and 527 CMR 12.00 prior to the issuance of a permit.

The following guidance is a summary of code interpretations and requirements from 780 CMR, 527 CMR 1.00, and 527 CMR 12.00 (NFPA 70, Massachusetts Electrical Code):

- An ESS should conform to the requirements below unless the ESS is listed as less than 1 kWh (3.6 mega joules).
- The ESS must be *listed* and *labeled* in accordance with UL 9540 and marked “For use in residential dwelling units” and be installed in accordance with the manufacturer’s instructions and NFPA 70.



- Individual battery storage units are to be separated from each other by not less than 3 feet (914 mm) except where smaller separation distances are allowed by the manufacturer's specifications.
- An ESS shall be installed only in the following locations:
 1. **In attached garages.** If an existing garage has 5/8" Type X gypsum wallboard, then ESS systems (80 kwh max.) shall be located in a 1 hr. fire rated enclosure, with hard-wired powered heat detector, interconnected with dwelling unit smoke detector system. If dwelling does not have hard-wired smoke detectors then a sounder base shall be installed within the main floor of dwelling unit. If the garage does not have 5/8" Type X gypsum wallboard then it would need to be installed as per 780 CMR IRC Ch.3.
 2. **In a basement, or enclosed utility closets, storage closets or storage spaces within basements.** A 1 hr. rated enclosure is required with 5/8" Type X gypsum wallboard at ceiling in enclosure. Also, 5/8" Type X gypsum wallboard shall be installed throughout remainder of basement ceiling. The basement must also be sprinklered per NFPA 13D. Smoke detectors shall also be installed in the basement and interconnected with the main dwelling unit.
 3. **In detached garage or accessory structure.** If a detached garage or structure is closer than 10' to the dwelling unit, then the walls within 10' of the dwelling shall be treated with the same level of protection as an attached garage (see item #1).
 4. **Outdoors or on the exterior side of exterior walls.** ESS battery storage units must be located more than 3' from doors or windows. ESS units must be within a noncombustible enclosure and contain a hard-wired smoke detector interconnected with the dwelling smoke detectors.
- ESS shall not be installed in/on main level living area, in sleeping rooms, or closets or spaces opening directly into sleeping rooms.
- Individual ESS units shall not exceed a maximum rating of 20 kWh. The aggregate rating of the ESS shall not exceed:
 1. 40 kWh within enclosed utility closets or storage spaces in basements.
 2. 80 kWh in attached, detached garages and detached accessory structures.
 3. 80 kWh outdoors.
- An ESS installation exceeding the permitted individual or aggregate ratings shall be installed in accordance with Chapter 52 of 527 CMR 1.00 and 780 CMR.
- Inverters shall be *listed* and *labeled* in accordance with UL 1741 or provided as part of the UL 9540 listing. Systems connected to the utility grid shall use inverters *listed* for utility interaction.

- An ESS installed in a location subject to vehicle damage shall be protected by *approved* barriers.
- Indoor installations of ESS that produce hydrogen or other flammable gases during charging are to be provided with mechanical *ventilation* in accordance with Section M1307.4 of 780 CMR IRC (as amended).
- A label shall be required on the installed system containing the contact information for the qualified maintenance and service providers.

The following information shall be provided with the application of an *ESS* installation: A copy of the manufacturer's specifications, installation manual, operation, maintenance, and decommissioning instructions. Upon the completion of the project this information shall be provided to the owner or placed in a conspicuous location near the *ESS* equipment.

In order to install an *ESS*, a building owner must obtain a permit from the Building Official per 780 CMR, Fire Official per 527 CMR 1.00, and Electrical Inspector per 527 CMR 12.00.

If a property *owner* within your jurisdiction is seeking a permit to install an *ESS*, and you have questions or concerns, please do not hesitate to contact:

- District State Building Inspector (<https://www.mass.gov/doc/state-building-inspector-district-assignments/download>)
- Division of Fire Safety, Department of Fire Services (<https://www.mass.gov/info-details/dfs-staff-list-and-directory#division-of-fire-safety->)

For communities North of I-90, contact Kristen McDonough at Kristen.mcdonough@mass.gov. For communities along South of I-90, contact Jake Nunnemacher at Jacob.nunnemacher@mass.gov.