

SECTION R330—ENERGY STORAGE SYSTEMS

R330.1 General. Energy storage systems (ESS) shall comply with the provisions of this section.

Exceptions:

1. ESS listed and labeled for use in habitable spaces, in accordance with UL 9540 and where installed in accordance with the listing, the manufacturer's instructions and *the California Electrical Code*.
2. ESS less than 1 kWh (3.6 megajoules).

R330.2 Equipment listings. Energy storage systems (ESS) shall be listed and labeled in accordance with UL 9540.

Exception: Where approved, repurposed unlisted battery systems from electric vehicles are allowed to be installed outdoors or in detached sheds located not less than 5 feet (1524 mm) from exterior walls, property lines and public ways.

R330.3 Installation. ESS shall be installed in accordance with the manufacturer's instructions and their listing.

R330.3.1 Spacing. Individual units shall be separated from each other by not less than 3 feet (914 mm) except where other separation distances are specified by the ESS listing and the manufacturer's installation instructions.

R330.4 Locations. ESS shall be installed only in the following locations:

1. Detached garages and detached accessory structures.
2. Attached garages separated from the dwelling unit living space in accordance with Section R302.6.
3. Outdoors or on the exterior side of exterior walls located not less than 3 feet (914 mm) from doors and windows directly entering the dwelling unit, except where smaller separation distances are permitted by the UL 9540 listing and manufacturer's installation instructions.
4. Enclosed utility closets, basements, storage or utility spaces within dwelling units with finished or noncombustible walls and ceilings. Walls and ceilings of unfinished wood-framed construction shall be provided with not less than $\frac{5}{8}$ -inch (15.9 mm) Type X gypsum wallboard. Openings into the dwelling shall be equipped with solid wood doors not less than $1\frac{3}{8}$ inches (35 mm) in thickness, solid or honeycomb-core steel doors not less than $1\frac{3}{8}$ inches (35 mm) in thickness, or doors with a 20-minute fire protection rating. Doors shall be self-latching and equipped with a self-closing or an automatic-closing device. Penetrations through the required gypsum wallboard into the dwelling shall be protected as required by Section R302.11, Item 4.

ESS shall not be installed in sleeping rooms, or closets or spaces opening directly into sleeping rooms.

R330.5 Energy ratings. Individual ESS units shall have a maximum rating of 20 kWh. The ratings of the ESS in each location shall not exceed the ratings in Table R330.5. The total aggregate ratings of ESS on the property shall not exceed 600 kWh.

ESS installations exceeding the permitted individual or aggregate ratings shall be installed in accordance with Section 1207 of the California Fire Code.

TABLE R330.5—MAXIMUM AGGREGATE RATINGS OF ESS

LOCATION	MAXIMUM AGGREGATE RATINGS (kWh)	INSTALLATION REQUIREMENTS
Within utility closets, basements, and storage or utility spaces located within dwellings	40	
In attached garages	80	
On or within 3 feet of exterior walls of dwellings and attached garages	100	
On or within 3 feet of exterior walls of dwellings and attached garages	200	Exterior walls and eaves are constructed with noncombustible surfaces ^a
In detached garages and detached accessory structures	200	
In detached garages and detached accessory structures	600	Detached garage or detached accessory structure is a minimum 10 feet away from property lines and dwellings
Outdoors on the ground	200	ESS is a minimum 3 feet away from property lines and dwellings
Outdoors on the ground	600	ESS is a minimum 10 feet away from property lines and dwellings

For SI: 1 foot = 304.8 mm.

a. Noncombustible wall surface shall extend in accordance with all the following:

1. A minimum of 5 feet horizontally from the edge of the ESS.
2. A minimum of 1 foot vertically below the bottom edge of the ESS.
3. A minimum of 8 feet vertically above the ESS, or to a non-combustible eave, whichever is less.

The code official is authorized to approve reductions of installation requirements based on large-scale fire testing complying with Section 1207.1.5 of the California Fire Code.

R330.6 Electrical installation. ESS shall be installed in accordance with the California Electrical Code. 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.

R330.7 Fire detection. Rooms and areas within dwelling units, basements and attached garages in which ESS are installed shall be protected by smoke alarms in accordance with Section R310. A heat detector, listed and interconnected to the smoke alarms, shall be installed in locations within dwelling units and attached garages where smoke alarms cannot be installed based on their listing.

[SFM] ESS installed in Group R-3 and townhomes shall comply with the following:

1. Rooms and areas within dwellings units, sleeping units, basements and attached garages in which ESS are installed shall be protected by smoke alarms in accordance with Section R314.
2. A listed heat alarm interconnected to the smoke alarms shall be installed in locations within dwelling units, sleeping units and attached garages where smoke alarms cannot be installed based on their listing.

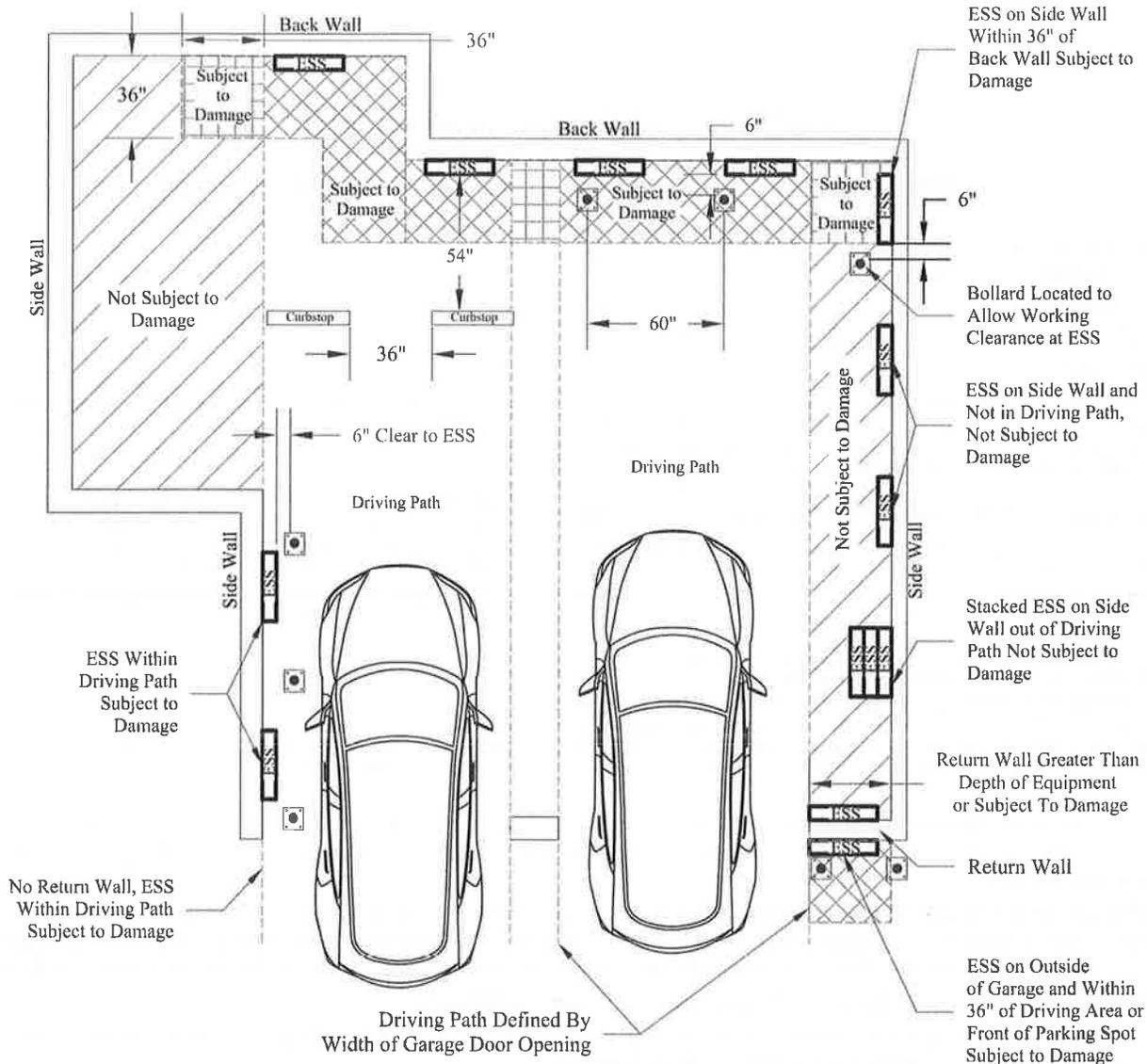
R330.8 Protection from impact. ESS installed in a location subject to vehicle damage in accordance with Section R330.8.1 or R330.8.2 shall be provided with impact protection in accordance with Section R328.8.3.

R330.8.1 Garages. Where an ESS is installed in the normal driving path of vehicle travel within a garage, impact protection complying with Section R330.8.3 shall be provided. The normal driving path is a space between the garage vehicle opening and the interior face of the back wall to a height of 48 inches (1219 mm) above the finished floor. The width of the normal driving path shall be equal to the width of the garage door opening. Impact protection shall also be provided for an ESS installed at either of the following locations (see Figure R330.8.1):

1. On the interior face of the back wall and located within 36 inches (914 mm) to the left or to the right of the normal driving path.
2. On the interior face of a side wall and located within 24 inches (610 mm) from the back wall and 36 inches (914 mm) from the normal driving path.

Exception: Where the clear height of the vehicle garage opening is 7 feet 6 inches (2286 mm) or less, ESS installed not less than 36 inches (914 mm) above finished floor are not subject to vehicle impact protection requirements.

FIGURE R330.8.1—ESS VEHICLE IMPACT PROTECTION



For SI: 1 inch = 25.4 mm.

R330.8.2 Other locations subject to vehicle impact. Where an ESS is installed in a location other than as defined in Section R330.8.1 and is subject to vehicle damage, impact protection shall be provided in accordance with Section R330.8.3.

R330.8.3 Impact protection options. ESS protection shall comply with one of the following:

1. Bollards constructed in accordance with one of the following:
 - 1.1. Minimum 48 inches (1219 mm) in length by 3 inches (76 mm) in diameter Schedule 80 steel pipe embedded in a concrete pier not less than 12 inches (305 mm) deep and 6 inches (152 mm) in diameter, with not less than 36 inches (914 mm) of pipe exposed, filled with concrete and spaced at a maximum interval of 5 feet (1524 mm). Each bollard shall be located not less than 6 inches (152 mm) from an ESS.
 - 1.2. Minimum 36 inches (914 mm) in height by 3 inches (76 mm) in diameter Schedule 80 steel pipe fully welded to a steel plate not less than 8 inches (203 mm) in length by 1/4 inch (6.4 mm) in thickness and bolted to a concrete floor by means of 4 1/2-inch (114 mm) concrete anchors imbedded not less than 3 inches (76 mm). Spacing shall be not greater than 60 inches (1524 mm), and each bollard shall be located not less than 6 inches (152 mm) from the ESS.
 - 1.3. Premanufactured steel pipe bollards filled with concrete and anchored in accordance with the manufacturer's installation instructions, with spacing not greater than 60 inches (1524 mm). Each bollard shall be located not less than 6 inches (152 mm) from the ESS.
2. Wheel barriers constructed in accordance with one of the following:
 - 2.1. Concrete or polymer 4 inches (102 mm) in height by 5 inches (127 mm) in width by 70 inches (1778 mm) in length, anchored to the concrete floor not less than every 36 inches (914 mm) and located not less than 54 inches (1372 mm) from the ESS. Concrete anchors not less than 3 1/2 inches (89 mm) in diameter with 3-inch

(76 mm) embedment per barrier shall be used. Spacing between barriers shall be not greater than 36 inches (914 mm).

- 2.2. Premanufactured wheel barriers shall be anchored in accordance with the manufacturer's installation instructions.
3. An approved method designed to resist an impact of 2,000 pounds per square foot (95 760 N/m²) in the direction of travel at 24 inches (610 mm) above grade.

R330.9 Ventilation. Indoor installations of ESS that produce hydrogen or other flammable gases during charging shall be provided with mechanical ventilation in accordance with *the California Mechanical Code*.

R330.10 Electric vehicle use. The temporary use of an owner or occupant's electric-powered vehicle to power a dwelling unit while parked in an attached or detached garage or outdoors shall comply with the vehicle manufacturer's instructions and *the California Electrical Code*.

R330.11 Documentation and labeling. The following information shall be provided:

1. A copy of the manufacturer's installation, operation, maintenance and decommissioning instructions shall be provided to the owner or placed in a conspicuous location near the ESS equipment.
2. A label on the installed system containing the contact information for the qualified maintenance and service providers.

R330.12 Toxic and highly toxic gas. ESS that have the potential to release toxic or highly toxic gas during charging, discharging and normal use conditions shall not be installed within Group R-3 or R-4 occupancies.