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ESS Subittal Handout

ONLINE PERMIT SUBMITTAL – PLEASE READ BELOW

To submit through the Dixon Civic Access Portal please go to [City of Dixon, CA](#) and you can find other information here [Welcome to the Official Website of the City of Dixon, CA - Forms, Fees, and Permits](#). You may also apply for a permit using SolarAPP+ using the Dixon Civic Access portal and you may find further information here [Welcome to the Official Website of the City of Dixon, CA - SolarApp+ Permitting Instructions](#).

CONVENTIONAL PERMIT SUBMITTAL – GENERAL REQUIREMENTS

- ☐ A separate application and building permit is required for Energy Storage Systems.
- ☐ Minimum plan size is 11"x17" with a minimum font size of 10.
 - Please include 2 full sets of plans and 2 sets of supporting documents. Provide manufacture's specifications and installation instructions for all new equipment.
- ☐ If a photovoltaic system is being applied for at the same time, please refer to the City of Dixon PV checklist for the submittal requirements.
- ☐ Include the applicable codes on the cover sheet for the project.
- ☐ Include a complete scope of work on the cover sheet for the project. Identify if the system is to be used as a partial home backup or a whole home backup.
- ☐ The City of Dixon strongly encourages ESS power storage units to be installed outside the garage. If power storage units must be mounted on the exterior of the structure, they shall be located such that they are not visible from a public or private street. A physical screening structure such as but not limited to a fence or natural vegetation may be required.
- ☐ When mounted in the garage, they shall be mounted on the interior sidewall of garages rather than the end wall. An area 18 feet x 16 feet wide clear of obstructions must be maintained for a standard 2 car garage (18 feet x 8 feet for a single car garage). This can be

demonstrated by providing a dimensioned plan of the garage and a cross section illustrating the energy storage systems mounted a minimum 36 inches above the finished floor to keep clear of most hoods, trunks, vehicle door swings, etc.

ELECTRICAL REQUIREMENTS

- ☐ Provide an accurate site and floor plan showing the following:
 - A legend or key for the site and floor plan.
 - The location of the structure and the location where the system is to be installed.
 - All equipment that is to be interconnected with the ESS (e.g., utility service, subpanel, PV system, etc.) shall be identified as new or existing equipment.
 - Show required (indoor/outdoor) working clearances for existing/new electrical equipment.
 - Show conduit/cable routing of the ESS, PV, and related circuits.
- ☐ Provide an elevation drawing of the system equipment.
- ☐ Show method and location of required ventilation equipment (if required) for indoor installations. (CEC 110.13(B))
- ☐ Show trench or overhead runs, as applicable, and denote whether conductors are routed indoors or outdoors.
- ☐ 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.
- ☐ Provide documentation from a National Recognized Testing Laboratory (NRTL) showing that the ESS is listed as a multi-mode inverter per UL 1741. (CEC 705.4)
- ☐ Add a note that plug-in type back-fed circuit breakers connected to an interconnected supply shall be secured in accordance with 408.36(D).
- ☐ Provide a permanent plaque or directory denoting all electric power sources 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)
- ☐ Disconnecting means shall be provided for the ESS. Disconnects are required within 5' of main service panel or if structural conditions exist may be within 10' of main service panel and within in sight. Permanent plaque or directory denoting location is required.
- ☐ Please demonstrate unobstructed access on the plans to all required disconnects or as determined by the City of Dixon Fire Department.

- ☐ Specifically for Tesla Powerwalls, clearly show how the Tesla Powerwall and the Backup Gateway communicate and how the load management functions (e.g., the low voltage cable must be shown in the single-line diagram)
- ☐ Provide a complete single-line diagram for the system. Include information for:
 - All new circuits, including, conductor/conduit size/type, and number of conductors.
 - Grounding and bonding
 - Method of interconnection
 - Overcurrent protection method and rating
 - All disconnecting means
 - Ratings (voltage, ampacity, environmental, etc.) for new and existing service equipment
- ☐ Calculations shall be part of the submittal and should include the following:
 - Sizing of new conductors
 - Overcurrent protection ratings
 - For Tesla Powerwalls, provide a label at the subpanel (Generation panel) that reads: NO BRANCH CIRCUIT LOADS LARGER THAN XX AMPS TO BE INSTALLED IN THIS SUBPANEL. (Note: XX corresponds to 30 amps if one Tesla Powerwall, 60 amps if two, 90 amps if three, etc.)

STRUCTURAL REQUIREMENTS

- ☐ Identify if the ESS will be wall- or floor-mounted.
- ☐ 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. (CBC 1603.1.8)
- ☐ If several ESSs are floor-mounted and their weight is equivalent to 400 lbs. (or more), you must provide structural details in the drawings and calculations as a separate document. (CBC 1616.10.15)
- ☐ ESSs mounted in a vehicular pathway must be protected from physical damage.

ELECTRICAL REQUIREMENTS

- ☐ An AC disconnect is required for the ESS within 5 feet and within sight of the main service panel.
- ☐ Line side taps are limited to 5 feet in length and required to be in Rigid Metal Conduit. (RMC)
- ☐ For services in excess of 200 amps, the available fault current must be larger than 10,000 amps. Provide short-circuit fault calculations.

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 in accordance with UL 9540 and marked “For use in residential dwelling units” where installed in accordance with 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 smaller separation distances are documented to be adequate based on large-scale fire testing complying with Section 1207.1.5 of the *California Fire Code*.

- ☐ **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.
 - 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 5/8-inch (15.9 mm) Type X gypsum wallboard. ESS shall not be installed in sleeping rooms, or closets or spaces opening directly into sleeping rooms *or in habitable spaces of dwelling units*.

- ☐ **R330.5 Energy ratings.** Individual ESS units shall have a maximum rating of 20 kWh. The aggregate rating of the ESS shall not exceed:
 - 1. 40 kWh within utility closets, basements and storage or utility spaces.
 - 2. 80 kWh in attached or detached garages and detached accessory structures.
 - 3. 80 kWh on exterior walls.
 - 4. 80 kWh outdoors on the ground. ESS installations exceeding the permitted individual or aggregate ratings shall be installed in accordance with Section 1207 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 R314. 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 R330.8.3.
- ☐ **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 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 (609 mm) from the back wall and 36 inches (914 mm) of 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.
- ☐ **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.
- ☐ **R328.8.3 Impact protection options.** Where ESS is required to be protected from impact in accordance with Section R330.8.1 or R330.8.2, such 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 (304 mm) deep and 6 inches (152 mm) in diameter, with at least 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 minimum 8-inch (203 mm) by 1/4-inch (6.4 mm) thick steel plate and bolted to a concrete floor by means of 4 1/2 inch (113 mm) concrete anchors with 3-inch (76 mm) minimum embedment. 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. Pre-manufactured steel pipe bollards shall be filled with concrete and anchored in accordance with the manufacturer's installation instructions, with spacing not greater than 60 inches (1524 mm), and each bollard shall be located not less than 6 inches (152 mm) from the

ESS.

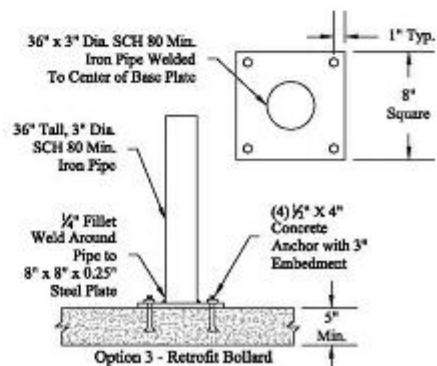
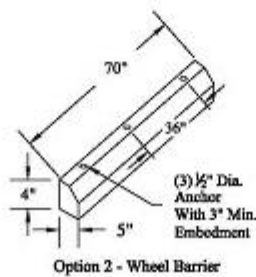
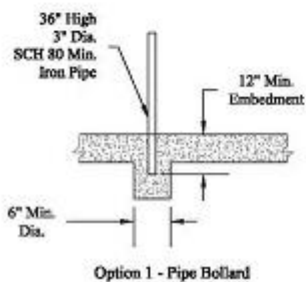
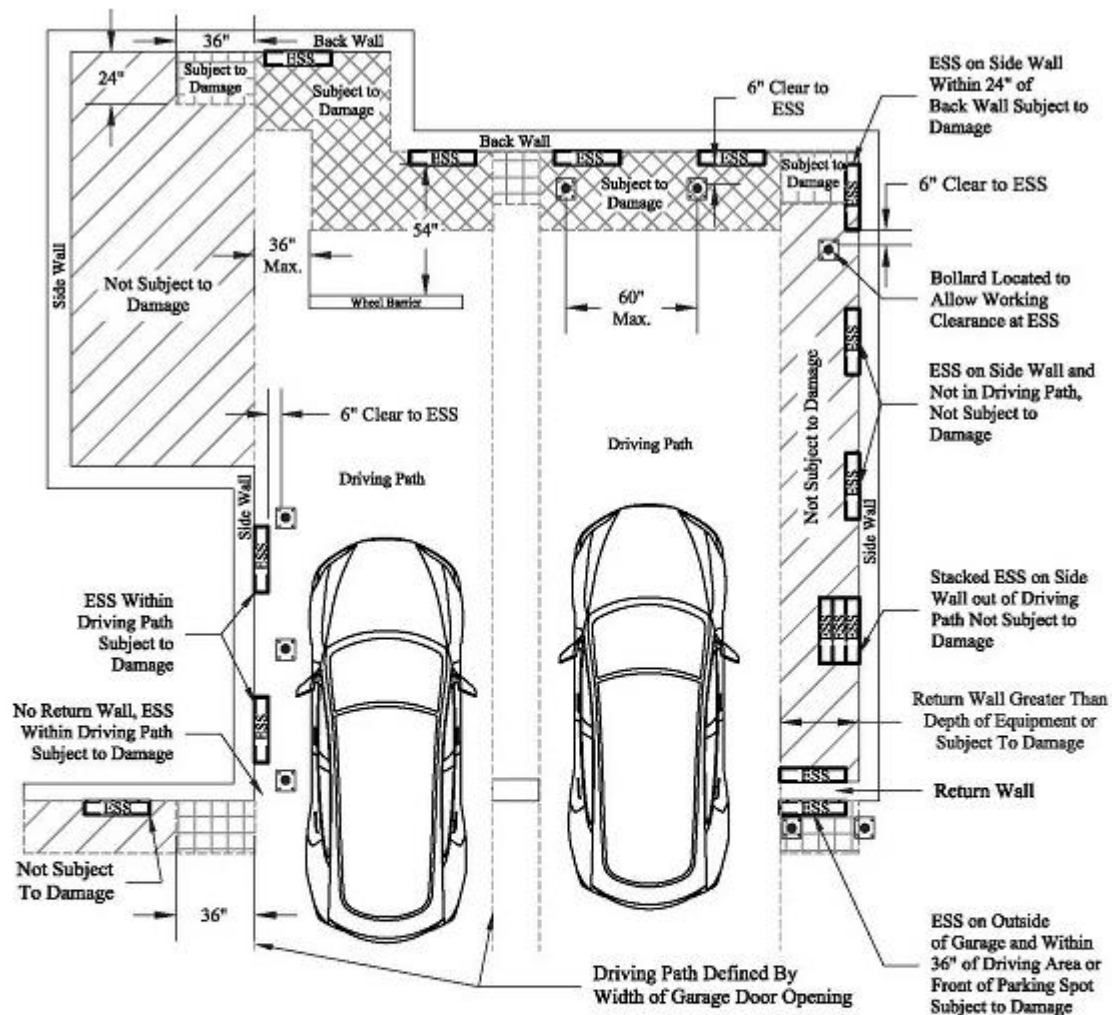
2. Wheel barriers constructed in accordance with one of the following:

2.1. Four inches (102 mm) in height by 5 inches (127mm) in width by 70 inches (1778 mm) in length wheel barrier made of concrete or polymer, 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. Minimum 31/2-inch (89 mm) diameter concrete anchors with a 3-inch (76 mm) embedment per barrier shall be used. Spacing between barriers shall be no greater than 36 inches (914 mm).

2.2. Pre-manufactured wheel barriers shall be anchored in accordance with the manufacturer's installation instructions.

3. Approved method designed to resist a 2000-lb. (8899 Newtons) impact in the direction of travel at 24 inches (608 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.*



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