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PHOTOVOLTAIC POWER SYSTEMS RESIDENTIAL GUIDELINES

This guideline will detail the requirements for submittals, installations, and inspections of solar photovoltaic (PV) power systems on one- and two-family residential occupancies.

The requirements in this guideline are taken from the 2018 edition of the International Fire Code (IFC) and are effective beginning March 5th

Plans are to be submitted for review and the issuance of a permit for the installation of solar PV systems. Per the exception in 605.11 of the IFC, the following are the only exceptions where a submittal and permit are not required from the Fire Department.

- Detached carports
- Detached shade structures
- Detached uninhabitable structures

Per 105.7.13 of the IFC, a permit is required from the Fire Department to install or modify a solar photovoltaic power system. Submittals will need to consist of the minimum following information and meet the requirements outlined in this memorandum.

1. A scaled site plan. The site plan is to include the following.

- a. Complete address with vicinity map.
- b. Complete roof layout with all ridges, valleys, hips, and gable ends shown.
- c. Location of all photovoltaic solar panels. Clearance dimensions are to be clearly shown on the plan.

d. Meter location.

e. Inverter location. NOTE: For micro inverter type installations, a prominent note is to be provided on the cover page noting that type of installation.

f. Disconnect location.

2. Copies or details of all required labels is to be provided as part of the submittal. The location of each label is to be shown on the site plan or is to clearly note on the details as to their required location.

Per 106.2 of the IFC, inspections are required by the Fire Department to verify compliance with all requirements of the IFC. Inspections requests shall be per the following.

1. Inspections can be requested using phone or email

2. For installations on new residences that are being constructed, a rough inspection of the wiring in the attic space is required prior to the ceilings being installed.

3. All installations require a final fire inspection prior to the final electrical inspection being conducted. The final fire inspection from the Fire Department is required.

4. Where access is required into the residence, garage, or back yard of an occupied residence (not one under construction), someone must be on site to provide access. This can be the homeowner or their designee.

5. Where wiring is installed in the attic space in an occupied residence, a ladder is to be provided for the Fire Inspector to access the space for inspection. The Fire Inspector does not carry a ladder.

6. For the most part, inspections are scheduled for the next business day when the request is made prior to 6 pm the day before. Special instructions can be left in the comment section when using voice mail to request inspections. This is helpful when needing to schedule an appointment due to access issues.

605.11 through 605.11.4 of the IFC details the requirements for the installation of photovoltaic solar systems. The plan submittal, labels and installation are to meet these requirements. The

following are the requirements taken directly from the IFC that apply to one and two family residential installations. Bold red text indicates commentary provided for clarity.

Deficiencies with any of these requirements can result in an inspection failing.

605.11.1 Marking. Marking is required on interior and exterior direct current (DC) conduit, enclosures, raceways, cable assemblies, junction boxes, combiner boxes and disconnects. Provide a note on the plan indicating compliance with this section. The marking will be inspected in the field.

605.11.1.1 Materials. The materials used for marking shall be reflective, weather resistant and suitable for the environment. Marking as required in Sections 605.11.1.2 through 605.11.1.4 shall have all letters capitalized with a minimum height of 3/8 inch white on red background. Provide a note on the plan indicating compliance with this section. Non-durable labels such as paper or ones made on a computer are not acceptable.

605.11.1.2 Marking content. The marking shall contain the words "WARNING: PHOTOVOLTAIC POWER SOURCE." Show on details.

§605.11.1.3 Main service disconnect. The marking shall be placed adjacent to the main service disconnect in a location clearly visible from the location where the disconnect is operated. Provide a note on the plan indicating compliance with this section. The label location and how it is attached will be inspected in the field.

605.11.1.4 Location of marking. Marking shall be placed on interior and exterior DC conduit, raceways, enclosures, and cable assemblies every 10 feet, within 1 foot of turns or bends and within 1 foot above and below penetrations of roof/ceiling assemblies, walls or barriers. Provide a note on the plan indicating compliance with this section. The installation of the labels will be inspected in the field. When labels are missing, the inspection will fail.

605.11.2 Locations of DC conductors. Conduit, wiring systems and raceways for photovoltaic circuits shall be located as close as possible to the ridge or hip or valley and from the hip or valley as directly as possible to an outside wall to reduce trip hazards and maximize ventilation opportunities. Conduit runs between sub arrays and to DC combiner

boxes shall be installed in a manner that minimizes the total amount of conduit on the roof by taking the shortest path from the array to the DC combiner box. The DC combiner boxes shall be located such that conduit runs are minimized in the pathways between arrays. DC wiring shall be installed in metallic conduit or raceways when located within enclosed spaces in a building. Conduit shall run along the bottom of load bearing members. Metallic conduit or raceways are required in attic spaces. Provide a note on the plan indicating compliance with this section. Conduit routing, wiring systems and raceways will be inspected in the field and deficiencies will be noted where they create a tripping hazard that could have been avoided, reduce the available ventilation area or are not secured in the attic space.

605.11.3.2.1 Residential buildings with hip roof layouts. Panels/modules installed on residential buildings with hip roof layouts shall be located in a manner that provides a 3 foot wide clear access pathway from the eave to the ridge on each roof slope where panels/modules are located. The access pathway shall be located at a structurally strong location on the building capable of supporting the live load of fire fighters accessing the roof.

Exception: These requirements shall not apply to roofs with slopes of two units vertical in 12 units horizontal (2:12) or less.

605.11.3.2.2 Residential buildings with a single ridge. Panels/modules installed on residential buildings with a single ridge shall be located in a manner the provides two, 3 foot wide access pathways from the eave to the ridge on each roof slope where panels/modules are located.

Exception: These requirements shall not apply to roofs with slopes of two units vertical in 12 units horizontal (2:12) or less.

605.11.3.2.3 Residential buildings with roof hips and valleys. Panels/modules installed on residential building with roof hips and valleys shall be located no closer that 18 inches to a hip or valley where panels/modules are to be placed on both sides of a hip or valley. Where panels are to be located on only one side of a hip or valley that is of equal length, the panels shall be permitted to be placed directly adjacent to the hip or

valley.

Exception: These requirements shall not apply to roofs with slopes of two units vertical in 12 units horizontal (2:12) or less.

605.11.3.2.4 Residential building smoke ventilation. Panels/modules installed on residential buildings shall be located no higher than 3 feet below the ridge in order to allow
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for fire department smoke ventilation operations.