PEORIA FIRE DEPARTMENT
8351 West Cinnabar Avenue
Peoria, Arizona 85345

Date: December 31, 2013 (revised October 28, 2014)

To: Installers/Designers of Solar Photovoltaic Power Systems

From: Peoria Fire Department – Fire Prevention Division

Subject: Residential Photovoltaic Solar Requirements

This memorandum 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 memorandum are taken from the 2012 edition of the *International Fire Code* (IFC) and are effective beginning January 1, 2014.

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. See sample drawings for examples.**
    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 noted 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 two (2) different methods. The first method is using the Inspection Request Line (IVR) at (623) 773-7220. The second method is to use the Accela Citizen Access (ACA) at **https://devservices.peoriaaz.gov/aca/peoria.aspx.**
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. The inspection code for a rough inspection for the Fire Department is a 960.
3. All installations require a final fire inspection prior to the final electrical inspection being conducted. The inspection code for a final fire inspection for the Fire Department is a 990.
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 ACA 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. Deficencies 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 enviroment. 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 lables 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 lable 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 lables will be inspected in the field. When lables 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 deficencies 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. **See Example #4. See sample drawings for references on how to note the required clearances on the plans.**

> **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. **See Example #3. See sample drawings for references on how to note the required clearances on the plans.**

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

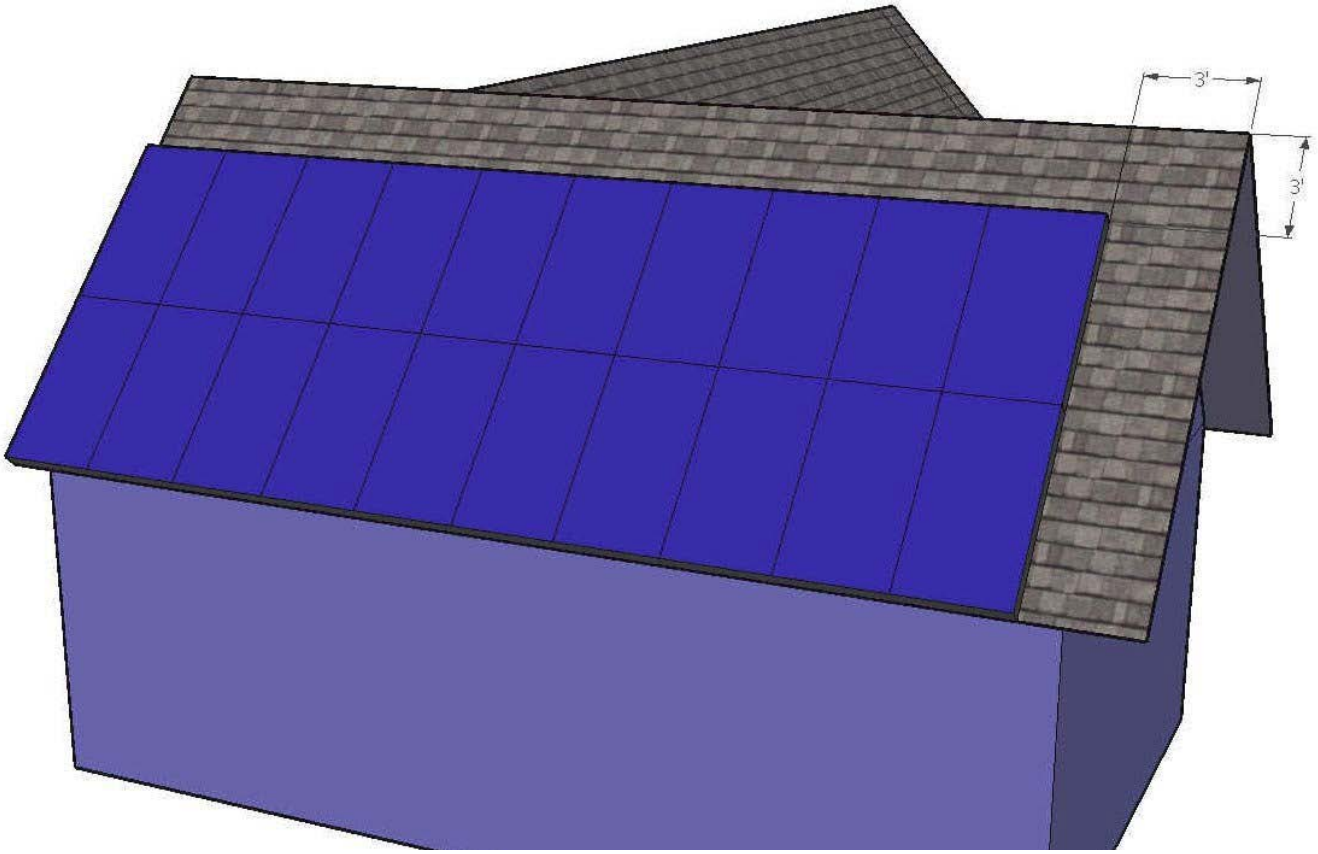
§605.11.3.2.3 Residential buildings with roof hips and valleys. Panels/modules installed on residential building with roof hips and valleys shall be located no closer that 18 inches to a hip or valley where panels/modules are to be placed on both sides of a hip or valley. Where panels are to be located 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. **See Example #2. See sample drawings for references on how to note the required clearances on the plans.**

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

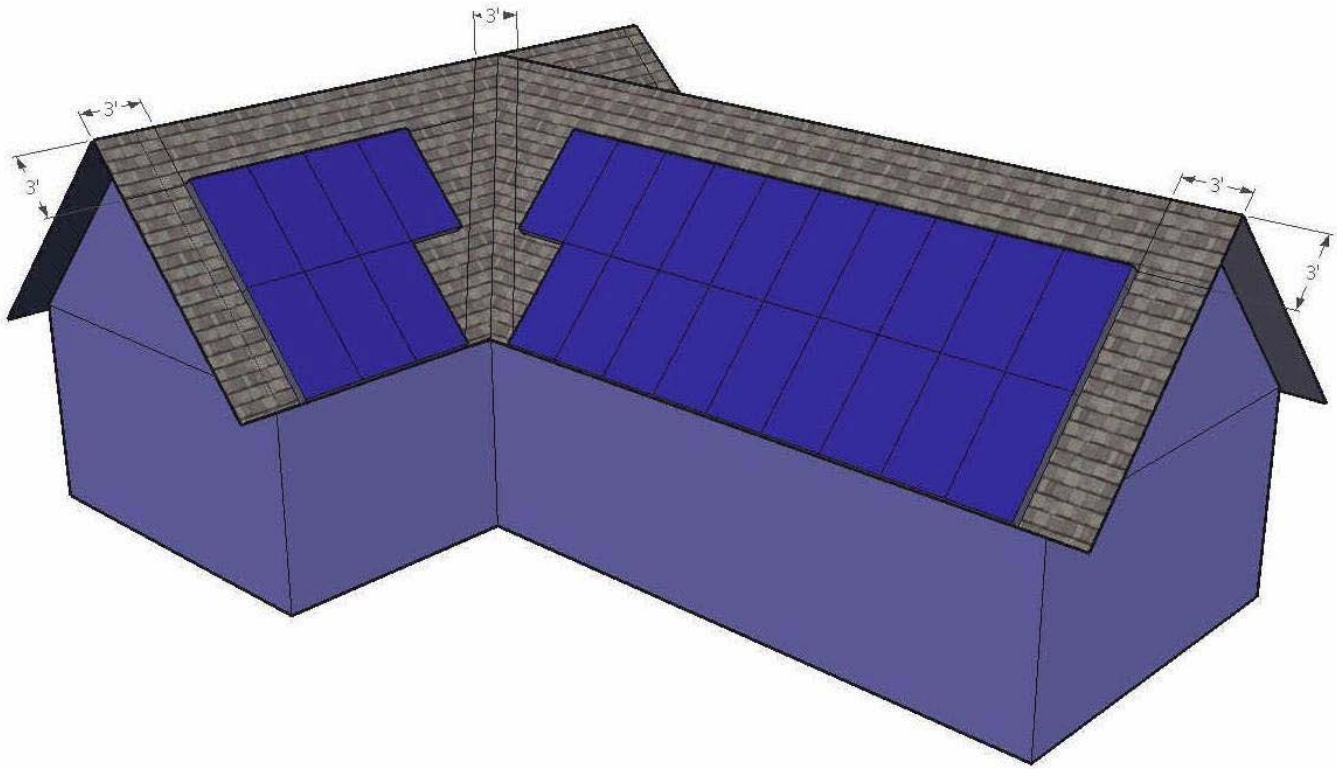
§605.11.3.2.4 Residential building smoke ventilation. Panels/modules installed on residential buildings shall be located no higher that 3 feet below the ridge in order to allow

for fire department smoke ventilation operations. **See Examples #1 through #4. See sample drawings for references on how to note the required clearances on the plans.**

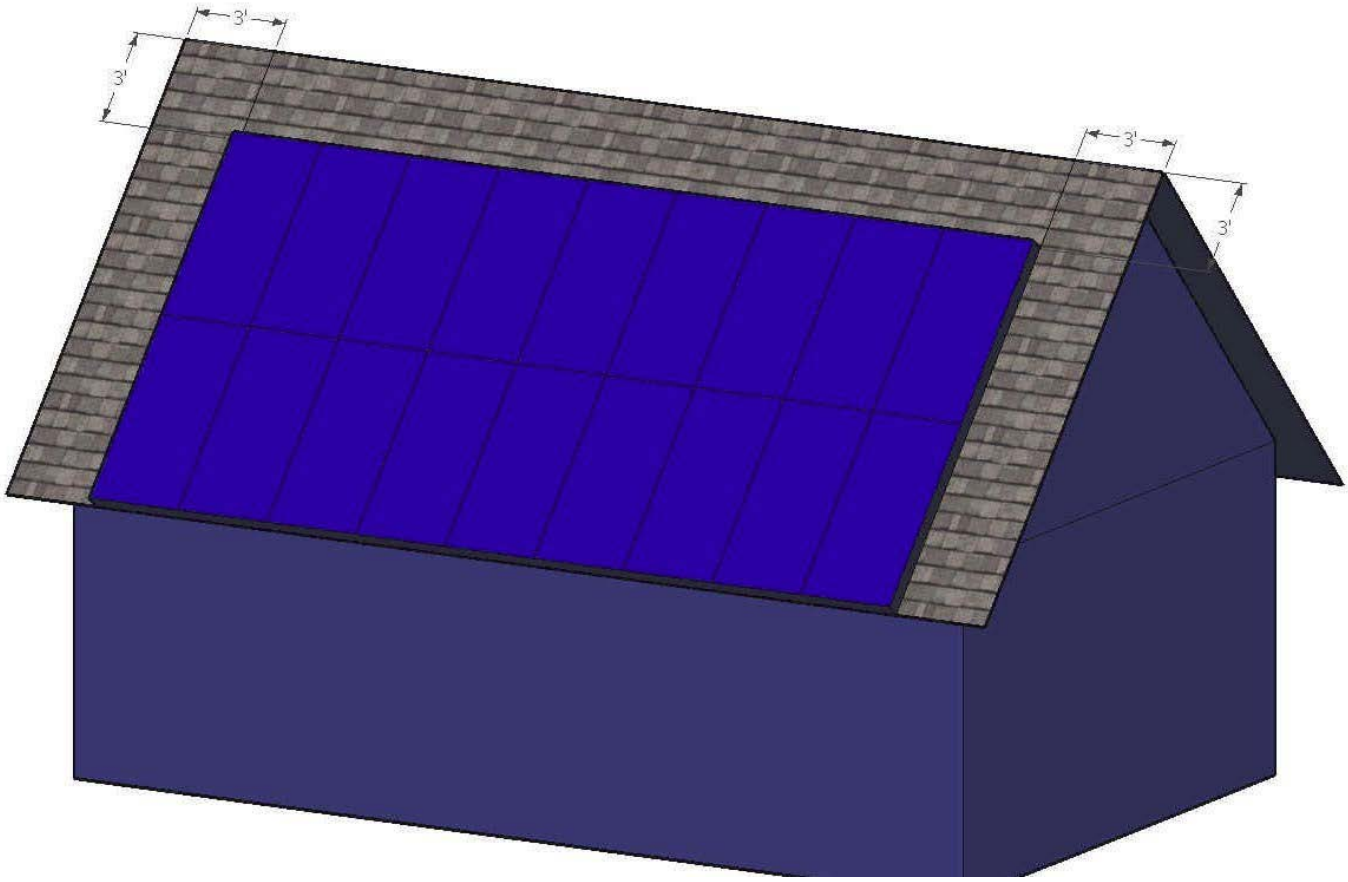
Example #1 – Cross Gable Roof



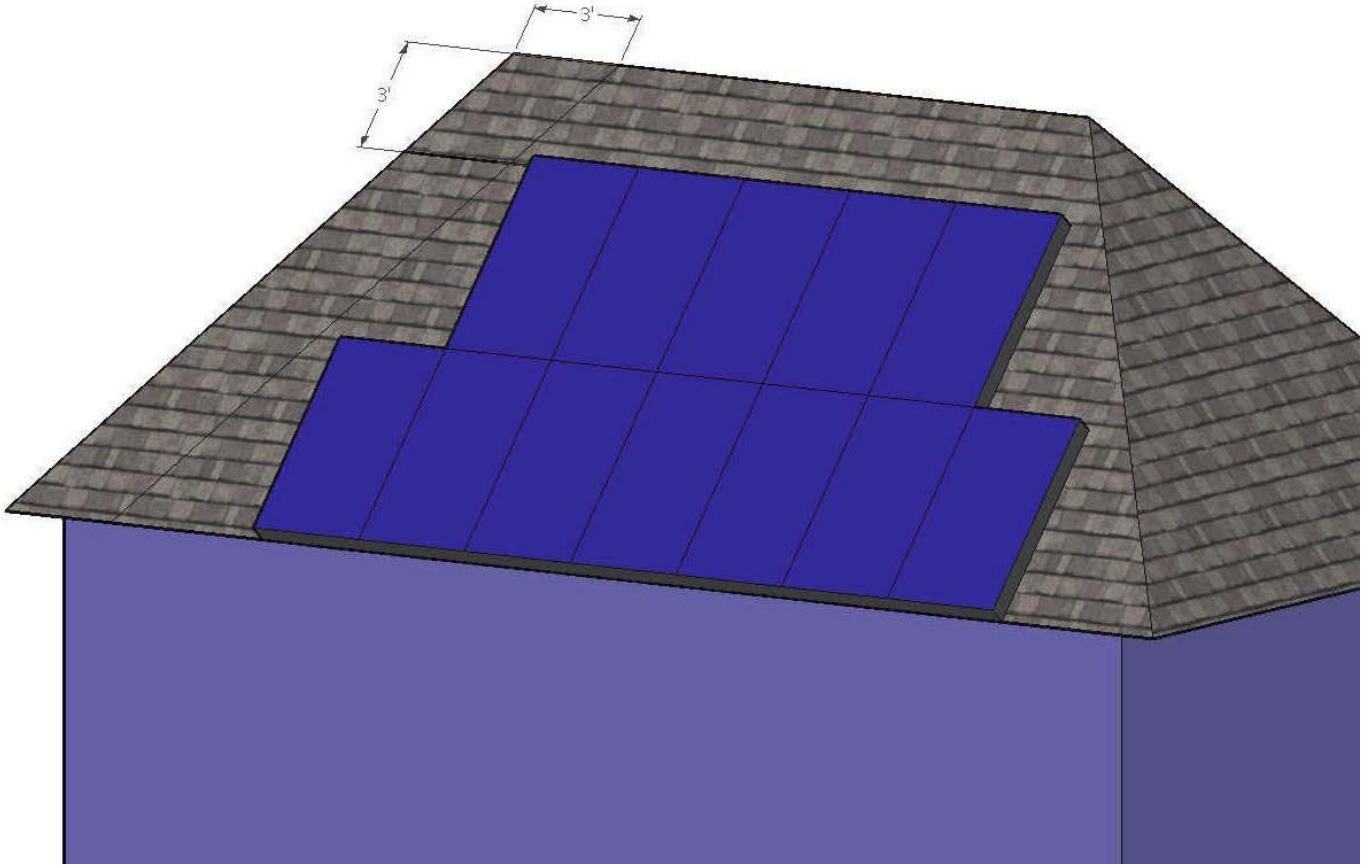
Example #2 – Cross Gable Roof with Valley



Example #3 – Full Gable Roof

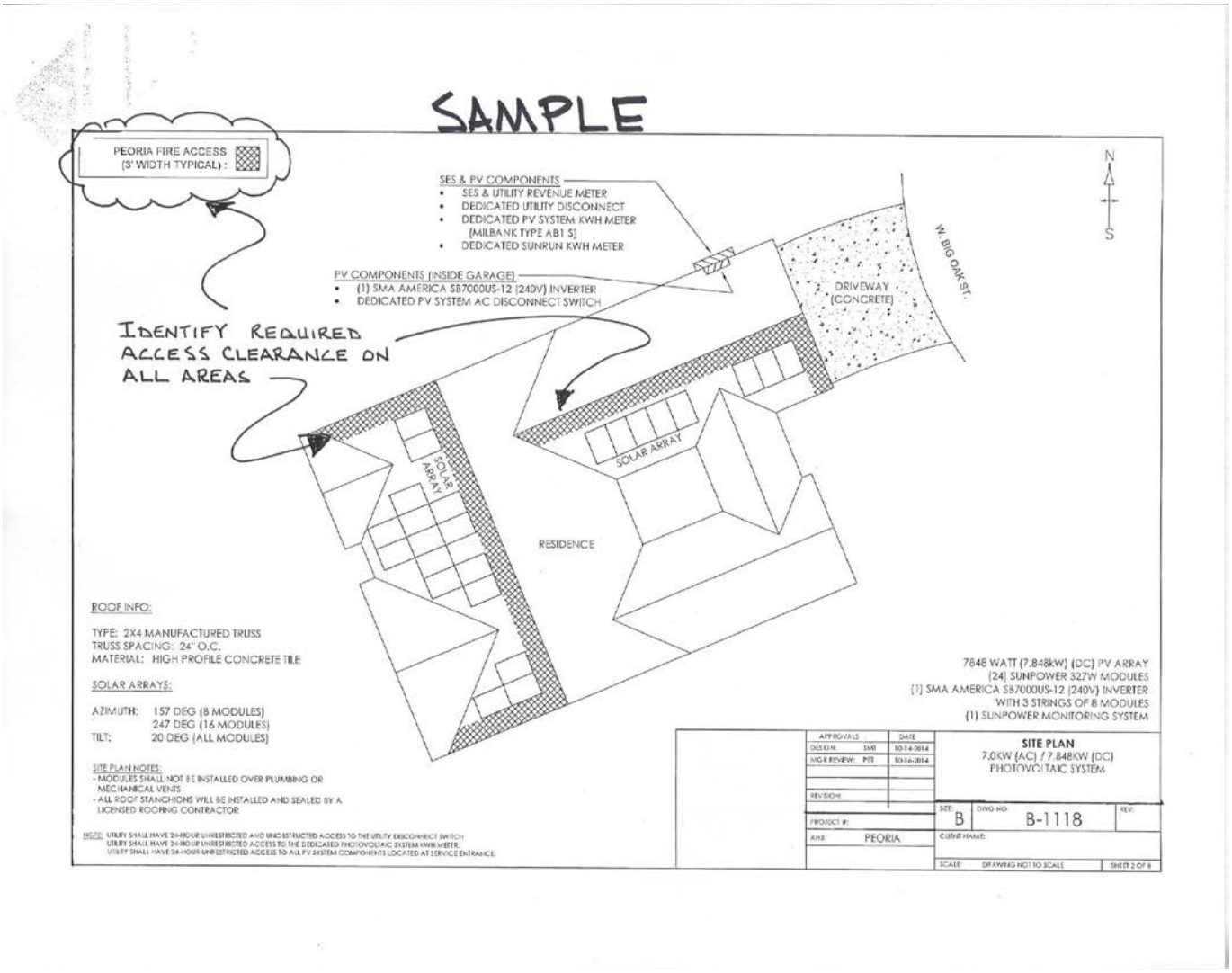


Example #4 – Full Hip Roof



Solar Drawing Example #1

Sample drawing showing that the required three (3) foot clearance is identified on all portions of the drawing.



Solar Drawing Example #2

Sample drawing showing that the required three (3) foot clearance is identified on all portions of the drawing. This sample includes identifying the eighteen (18) inch clearance on both sides of the hip and valley.