



WOODSIDE FIRE PROTECTION DISTRICT

Solar Photovoltaic System (PV) Design and Installation Standard

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SCOPE. This standard and guideline provide the minimum requirement necessary for the installation of solar photovoltaic power systems. Installations shall be in accordance with California Building or Residential Code, Electrical Code, Fire Code and Woodside Fire Protection District Ordinance No. 12.

LABELING

All signage, labels and placards shall be: RED SIGN WITH WHITE LETTERS or as approved by the fire code official.

Per the Woodside Fire Protection District, (WFPD) Ordinance #12 a standard of specific installation conditions is in place to ensure firefighter and public safety for all Solar PV systems. Solar PV power systems shall also follow Section 1205 of the 2022 California Fire Code.

WFPD appreciates the environmentally friendly technologic advances these systems bring, however, traditional firefighting techniques, such as roof venting, water extinguishment and fire overhaul must be modified to ensure human safety.

Roofs that contain solar arrays will be most difficult for firefighters to vent. Delayed roof venting may increase the time factor in fire containment resulting in a greater extent of fire damage overall. Conventional water extinguishment on roofs may not be an option for firefighters if the integrity of any portion of the Solar array is threatened. The risk of accidental electric shock is greatly increased with systems that have been compromised. Fire overhaul will also be a challenge for firefighters and inspectors as broken panels or compromised solar conduit will remain energized during daylight hours.

INSTALLATION REQUIREMENTS (ROOF AND GROUND MOUNTED)

1. All pathways shall be located over areas capable of supporting the live load of fire fighters accessing the roof. Pathways shall be located in areas with minimal obstructions, such as vent pipes, conduit or mechanical equipment, *CFC 1205.2*
2. Pathways to the ridge. A minimum of two 36-inch-wide pathways on separate roof planes,

from lowest roof edge to ridge, shall be provided on all buildings. **At least one pathway shall be provided on the street or driveway side of the roof.** For each roof plane with a photovoltaic array, at least one 36-inch-wide pathway from lowest roof edge to ridge shall be provided on the same roof plane as the photovoltaic array, or on an adjacent roof plane, or straddling the same and adjacent roof planes. *CFC 1205.2.1.1*

- a) Exception: Detached, nonhabitable Group U occupancies and solar integrated roof panels may be installed without any setback to the ridge or eaves.

3. Setbacks at ridge, *CFC 1205.2.1.3*

- a) For photovoltaic arrays occupying 33% or less (**66% or less if sprinklered**) of the plan view total roof area = 18-inch minimum wide setback is required on both sides of a horizontal ridge.
- b) For photovoltaic arrays occupying more than 33% (**66% if sprinklered**) of the plan view total roof area = 36-inch minimum wide setback is required on both sides of a horizontal ridge.

4. Ground mounted Solar arrays will be erected on a noncombustible base. A clear, brush free area of 10 feet shall be required around the perimeter of the ground mounted photovoltaic arrays. *CFC 1205.5.1*

5. Emergency escape and rescue openings. Panels and modules installed shall not be placed on the portion of a roof that is below an emergency and rescue opening. A pathway of not less than 36 inches wide shall be provided to the emergency escape and rescue opening. *CFC 1205.2.2*

6. 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. *CFC 1205.2.4*

7. Rapid shutdown shall meet the requirements of *CFC 1205.4*

8. Signage, **WARNING: PHOTOVOLTAIC POWER SOURCE** shall be placed on conduit, raceways, enclosures, junction boxes (interior or exterior). AC and DC disconnects shall be labeled as such, with fade resistant red labels having white lettering. All labels shall conform to UL 969, red labels with white lettering. **All conduit on roofs shall be labeled regardless if it's AC or DC.**

9. Install a red permanent phenolic plaque on the main service denoting:
 - a) **Photovoltaic Disconnect**
 - b) **CAUTION: Solar PV System Installed-When Power Disconnected Solar Panels and Wiring May Remain Energized During Daylight Hours**
10. Provide a red permanent phenolic plaque next to the main electrical disconnect denoting building site plan and solar array locations.
11. Install a red permanent phenolic plaque at the service entrance equipment denoting all electrical power sources and location of onsite emergency power sources (*CEC 705.10*). Minimum size shall be 3"x4."
12. Array DC disconnects shall be accessible and labeled with red weather resistant **UL 969 compliant signage.**
13. All disconnects shall be accessible to fire department and located together when possible.
14. Approved fire plans, fire comments and permit must be on site at the time of inspection. No exceptions.
15. Final acceptance of this project is subject to field inspection.

SIGNAGE REQUIREMENTS FOR SOLAR PV SYSTEMS

Two forms of signage are required for Solar PV Systems. Permanently affixed reflective labels should have a red background with white lettering. Materials used for marking must be weather resistant in compliance with UL 969. Size of lettering should be equal to the example below.

1. Exterior/Interior Conduit signage:

Horizontal and Vertical to be installed every 10 feet, at turns and above and/or below penetrations and all DC combiner and junction boxes.

WARNING: PHOTOVOLTAIC POWER SOURCE

2. Exterior/Interior of Electrical Panel signage:

CAUTION

Solar PV System Installed. When Power Disconnected Solar Panels and Wiring In Conduit May Remain Energized During Daylight Hours.

3. All conduit labeling, and signage shall be completed prior to Inspector's arrival. Failure to be ready may result in reinspection fees.

Diagram 1: Cross Gable Roof

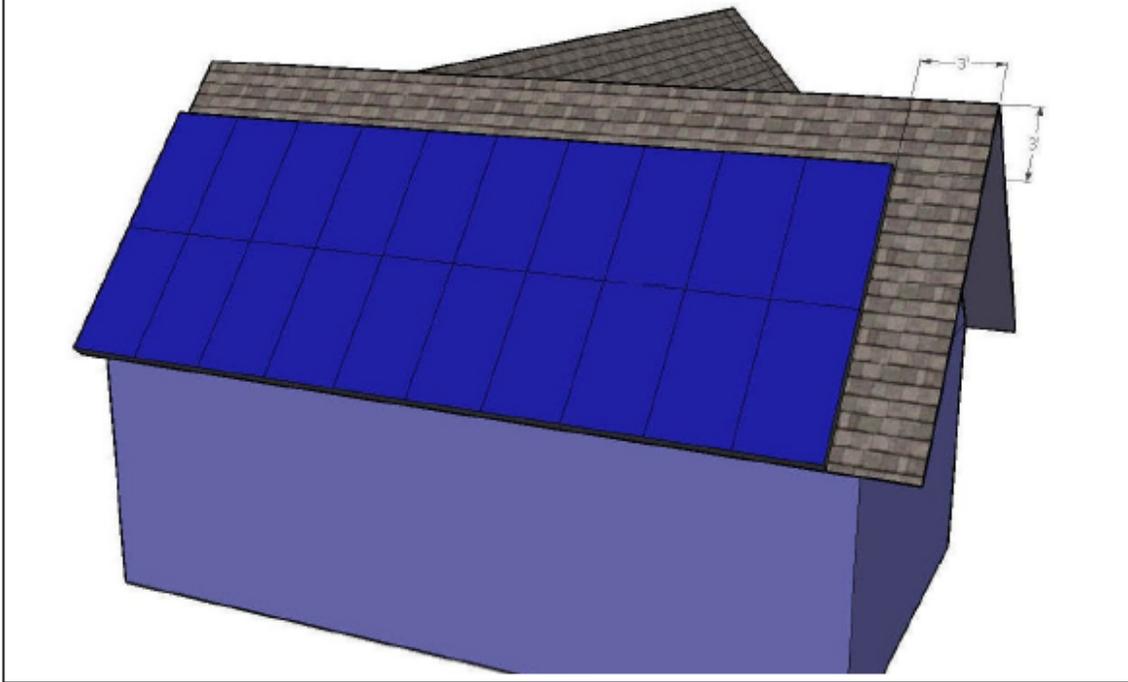
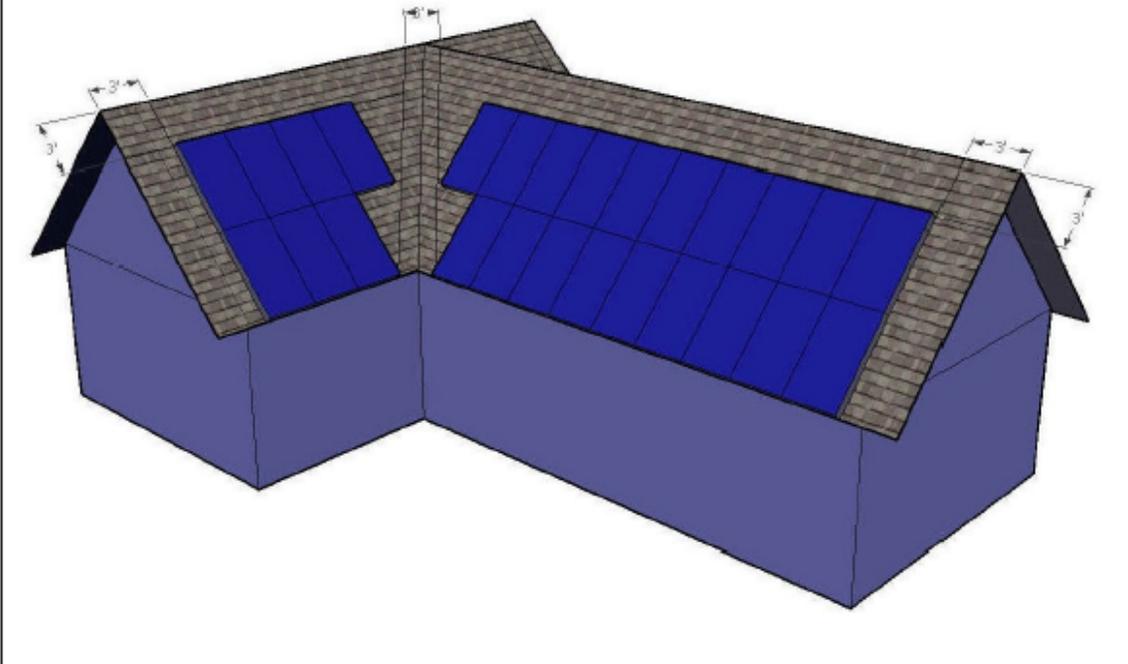
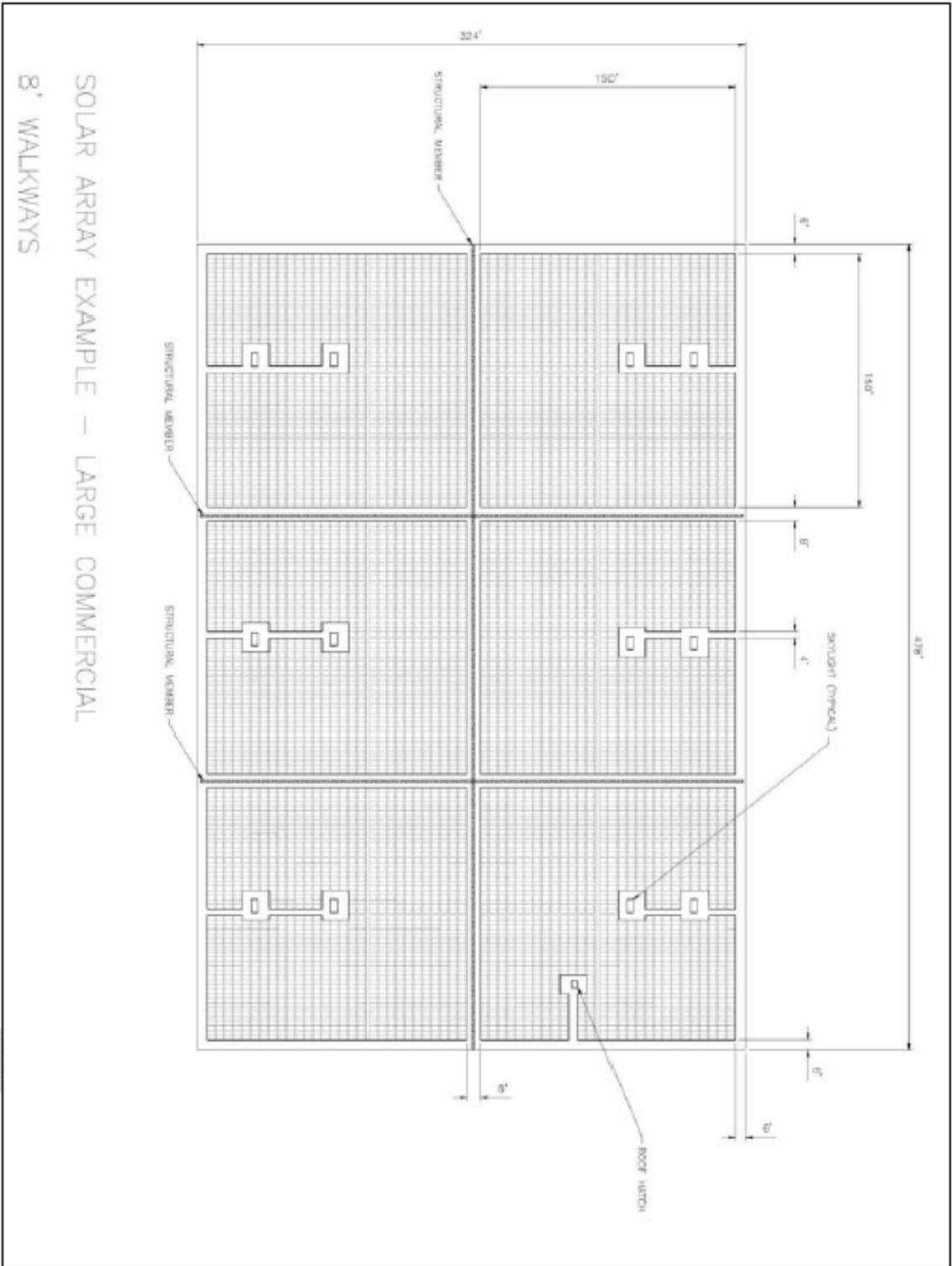


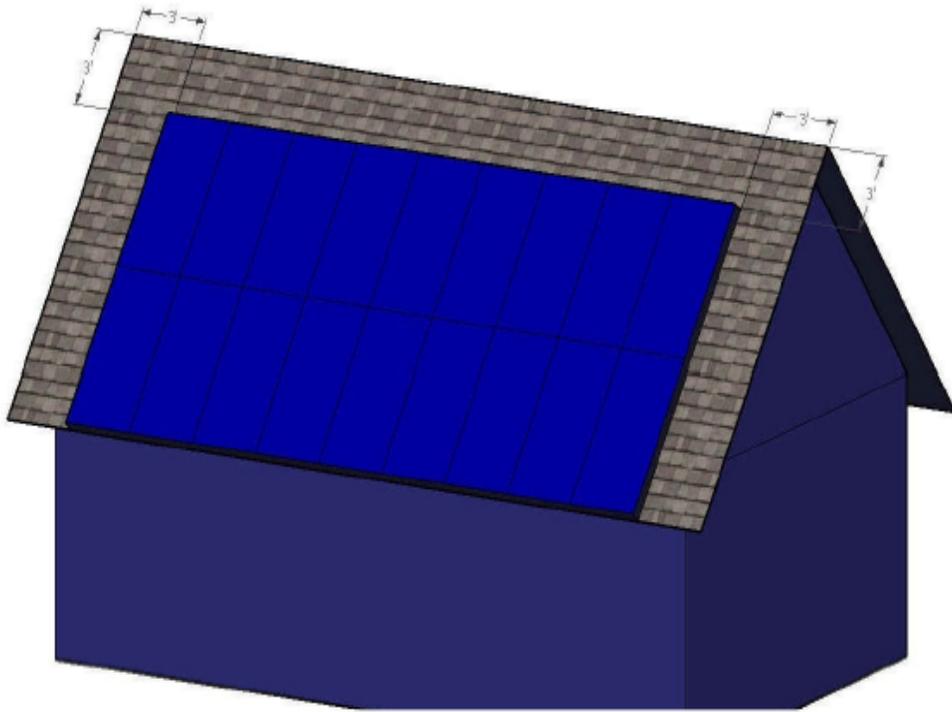
Diagram 2: Cross Gable with Valley



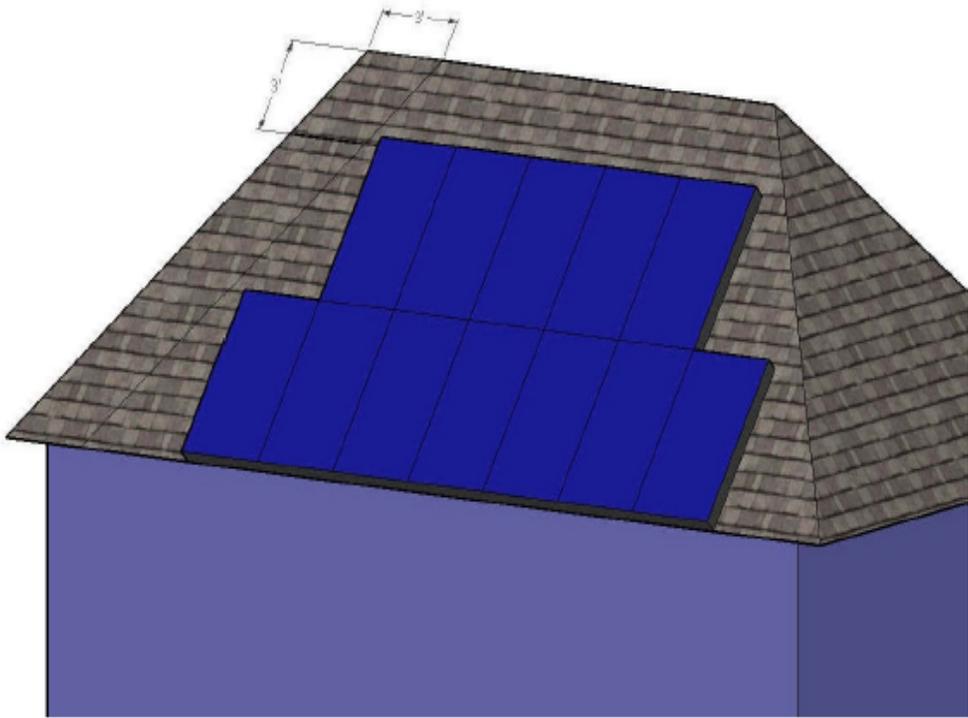


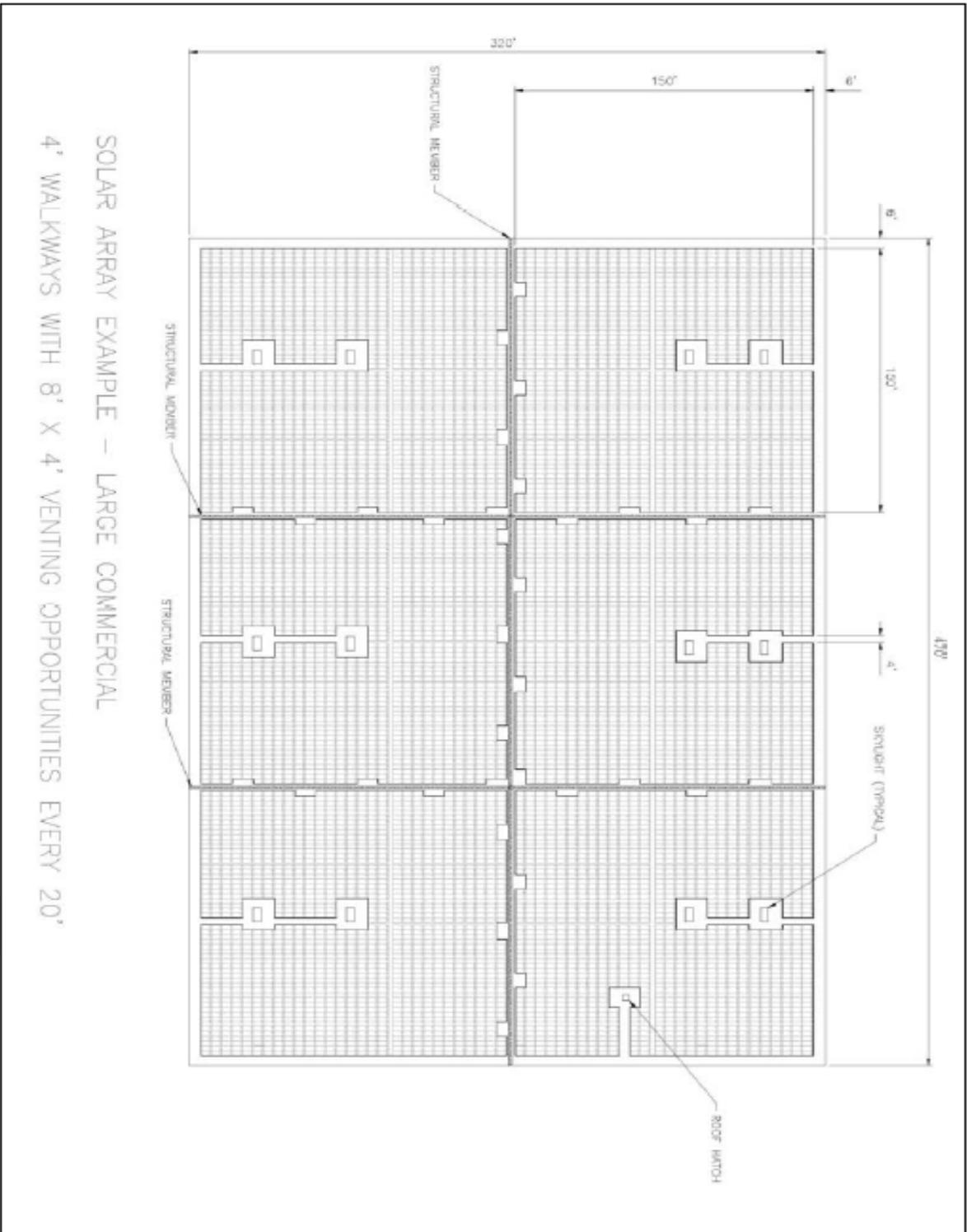
SOLAR ARRAY EXAMPLE – LARGE COMMERCIAL
 8' WALKWAYS

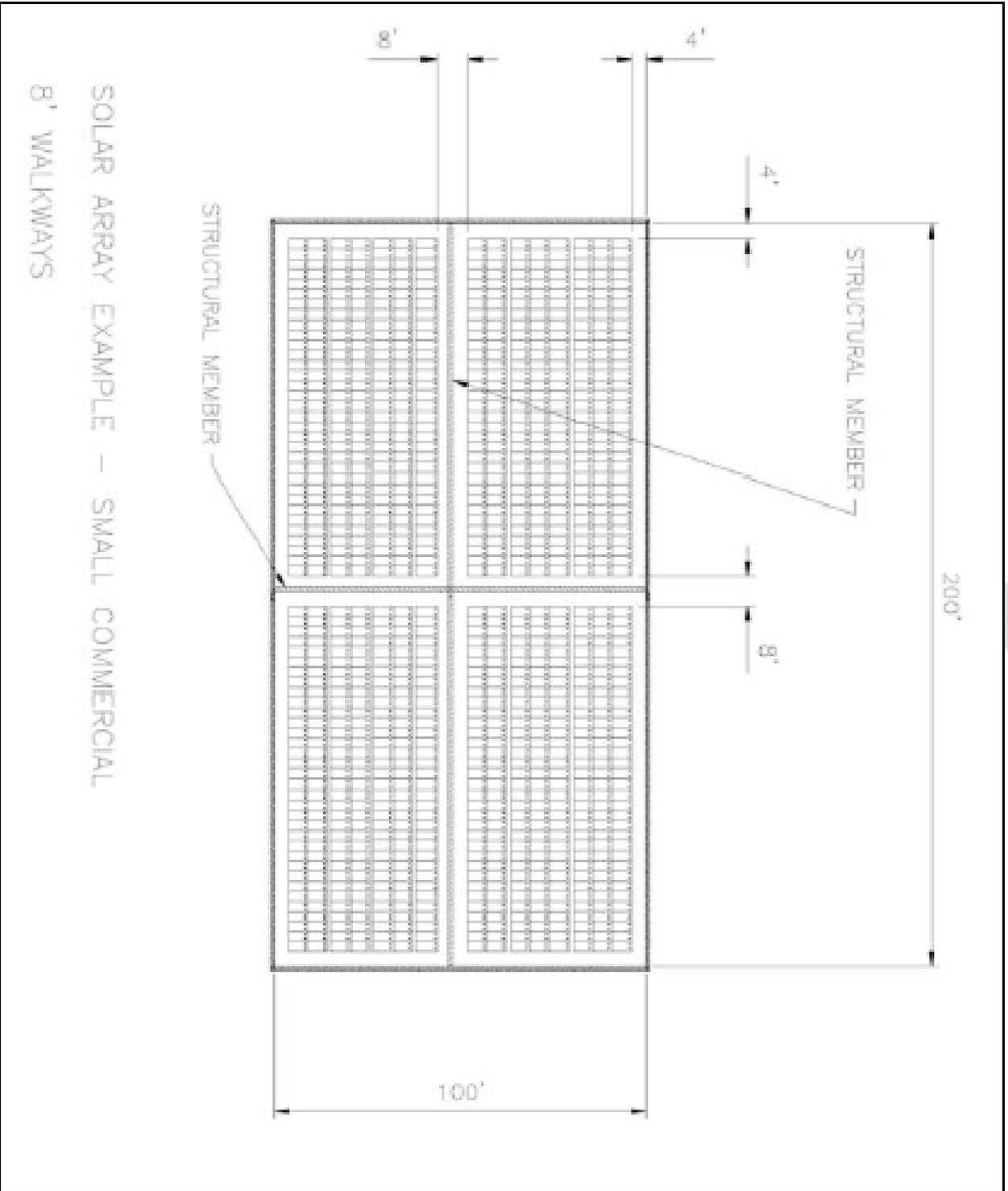
Diagram 3: Full Gable



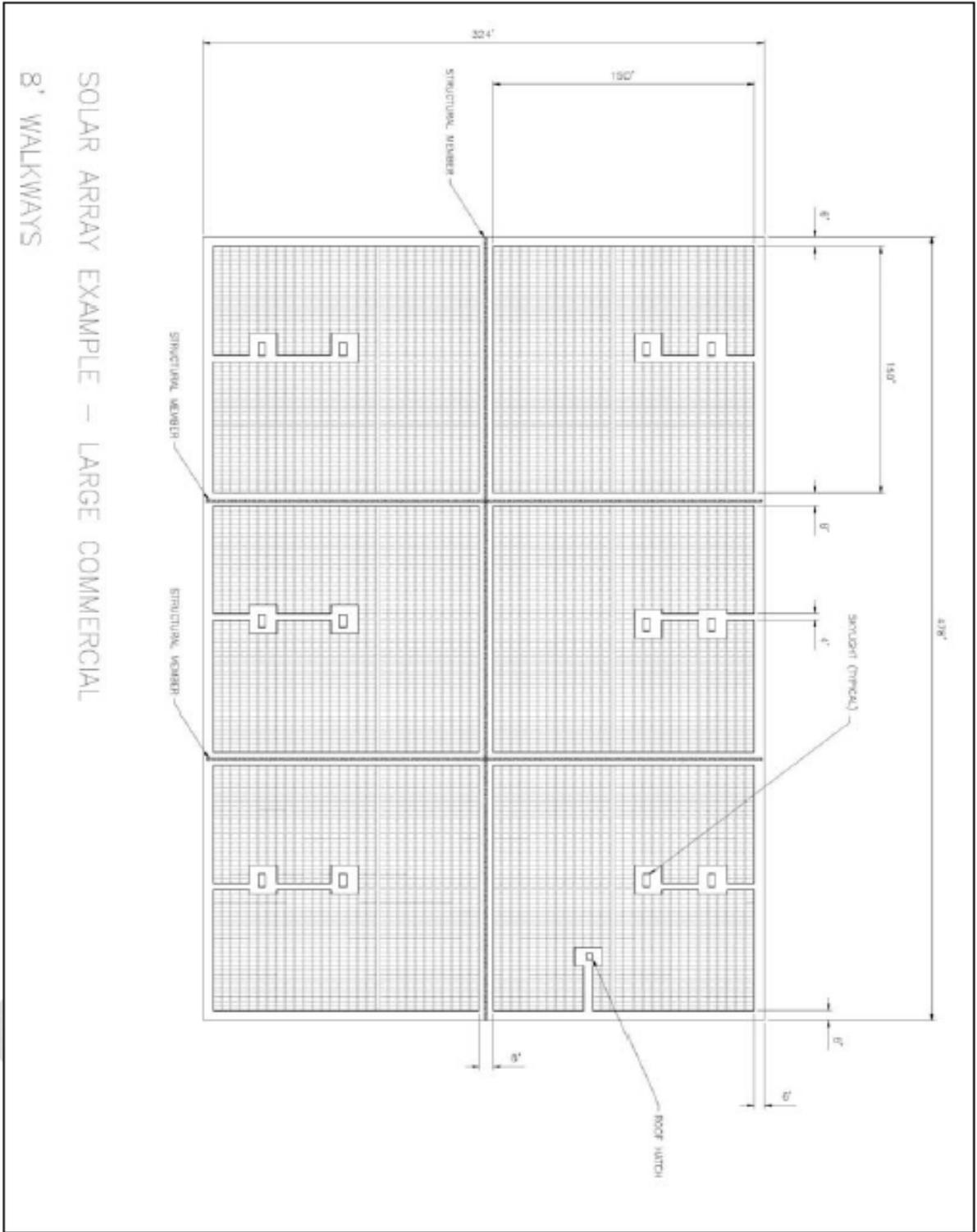
Example 4: Full Hip Roof







SOLAR ARRAY EXAMPLE – SMALL COMMERCIAL
8' WALKWAYS



SOLAR ARRAY EXAMPLE – LARGE COMMERCIAL
8' WALKWAYS