



Structural Criteria for Residential Rooftop Solar Energy Installations

STRUCTURAL CRITERIA FOR RESIDENTIAL FLUSH-MOUNTED SOLAR ARRAYS

1. ROOF CHECKS

- A. Visual Review/Contractor's Site Audit of Existing Conditions:
- 1) Is the roof a single roof without a reroof overlay? Y N
 - 2) Does the roof structure appear structurally sound, without signs of alterations or significant structural deterioration or sagging, as illustrated in Figure 1? Y N
- B. Roof Structure Data:
- 1) Measured roof slope (Flat to 6:12): _____:12
 - 2) Measured rafter spacing (center-to-center): _____ inch
 - 3) Type of roof framing (rafter or manufactured truss): Rafter Truss

2. SOLAR ARRAY CHECKS

- A. Flush-mounted Solar Array:
- 1) Is the plane of the modules (panels) parallel to the plane of the roof? Y N
 - 2) Is there a 2" to 10" gap between underside of module and the roof surface? Y N
 - 3) Modules do not overhang any roof edges (ridges, hips, gable ends, eaves)? Y N
- B. Do the modules plus support components weigh no more than:
4 psf for photovoltaic arrays or 5 psf for solar thermal arrays? Y N
- C. Does the array cover no more than half of the total roof area (all roof planes)? Y N
- D. Are solar support component manufacturer's project-specific completed worksheets? Y N
- E. Is a roof plan of the module and anchor layout attached? (see Figure 2) Y N
- F. Downward Load Check (Anchor Layout Check):
- 1) Proposed anchor horizontal spacing (see Figure 2): _____' - _____"ft-in
 - 2) Is proposed anchor horizontal spacing equal to or less than 4'0" on-center? Y N
- G. Wind Uplift Check (Anchor Fastener Check):
- 1) Anchor fastener data (see Figure 3):
 - a. Diameter of lag screw, hanger bolt or self-drilling screw: _____ inch
 - b. Embedment depth of rafter: _____ inch
 - c. Number of screws per anchor (typically one): _____
 - d. Are 5/16" diameter lag screws with 2.5" embedment into the rafter used, OR does the anchor fastener meet the manufacturer's guidelines? Y N

3. SUMMARY

- A. All items above are checked YES. No additional calculations are required.
- B. One or more items are checked NO. Attach project-specific drawings and calculations stamped and signed by a California-licensed civil or structural engineer.

Job Address: _____ Permit #: _____
 Contractor/Installer: _____ License # & Class: _____
 Signature: _____ Date: _____ Phone #: _____

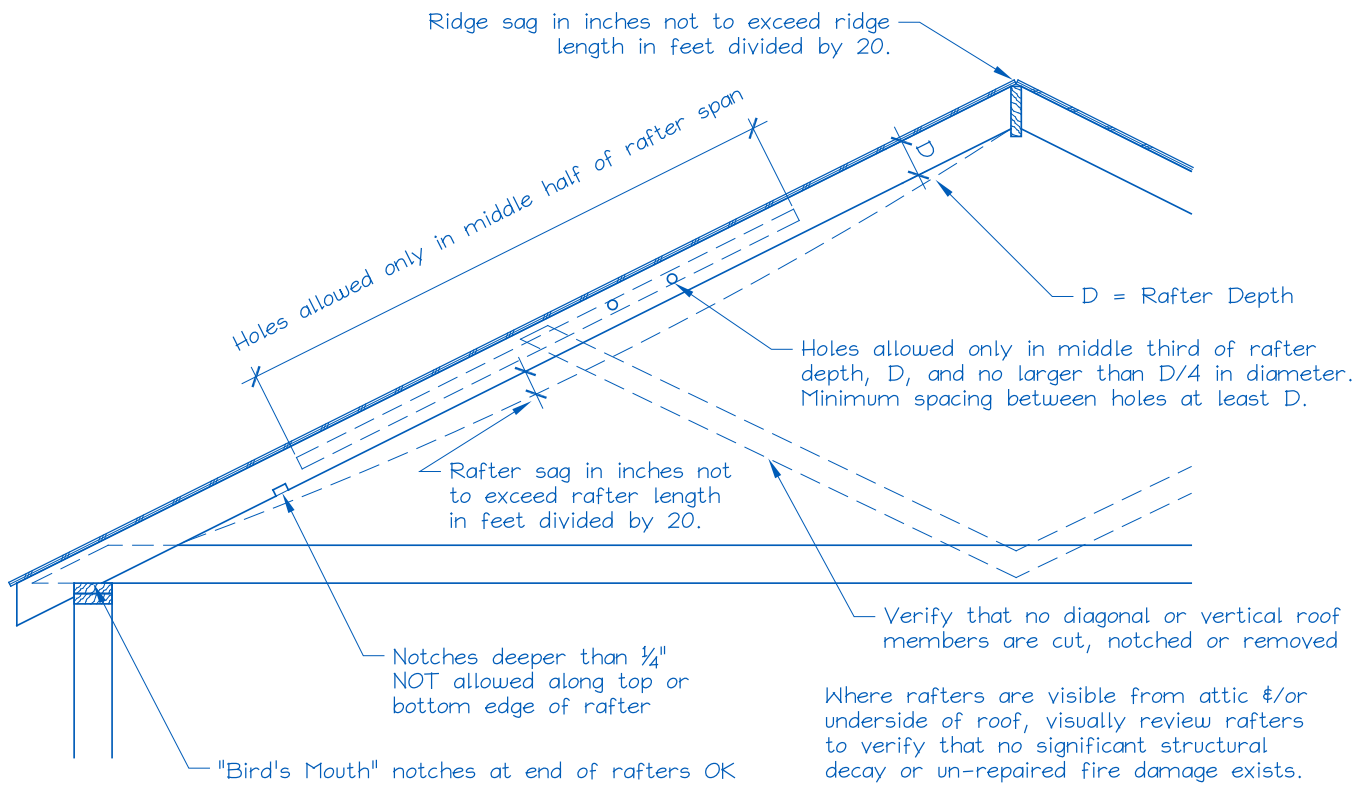


Figure 1. Roof Visual Structural Review (Contractor's Site Audit) of Existing Conditions.

The site auditor should verify the following:

1. No visually apparent disallowed rafter holes, notches and truss modifications as shown above.
2. No visually apparent structural decay or un-repaired fire damage.
3. Roof sag, measured in inches, is not more than the rafter or ridge beam length in feet divided by 20.

Rafters that fail the above criteria should not be used to support solar arrays unless they are first strengthened.

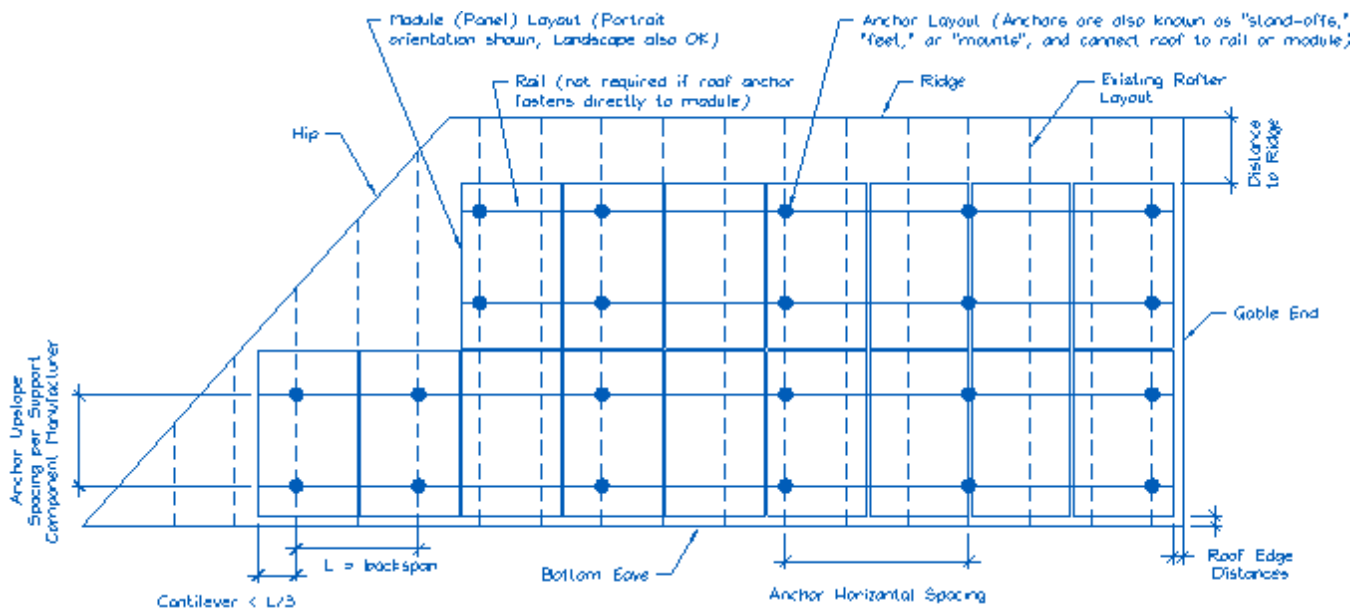


Figure 2. Sample Solar Panel Array and Anchor Layout Diagram (Roof Plan).

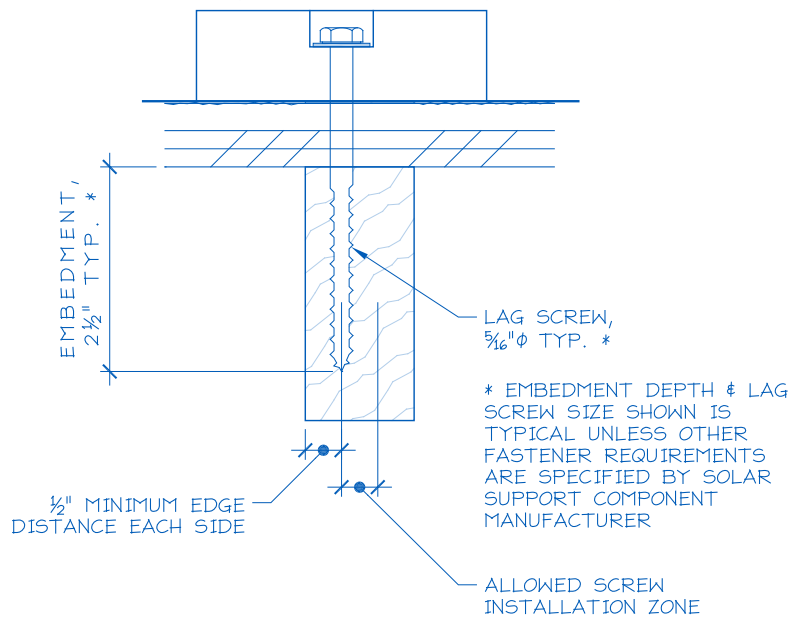


Figure 3. Typical Anchor with Lag Screw Attachment.