

## Residential Remodel Building Permit Requirements Single-family Roof Solar Shingle

### **Important notes about building permit request submissions**

- All permit applications must be submitted online using the [Customer Access](#) portal.
- There is no need to email us when you submit documents. Staff is notified automatically within one business day of your submission.
- Submit documents as PDF file type only.
- Please include the following:
  1. List the site address on all documents and plans.
  2. Include the owner's name on all documents.
- Permit review will be delayed if the required documents are not submitted online, if they are not submitted as PDFs, or if the documentation is missing information.
- All submitted documents will become a public permanent record of the property. It is in your best interest that the submitted PDFs are of the highest quality and detail, in case you or somebody else needs to refer to them in the future.

### **General Requirements**

1. Specify:
  - a. Whether the roof has a pitch lower than a 5/12 or 22.62 degrees. No rough roof inspection is necessary, but an engineer-signed compliance letter is required if the pitch is equal to or above the 5/12 pitch.
  - b. The Direct Current (DC) rating of the proposed system.
  - c. The number of modules proposed.
  - d. The name of the serving electrical utility.
2. The code information is to match Arapahoe County's currently adopted codes including:
  - a. 2021 International Residential Code (IRC)

- b. 2020 National Electrical Code (NEC)
- c. All Arapahoe County [amendments](#).

## Required documents

Attach the following to the online application:

1. Site Plan:
  - a. It must show the location of all proposed construction in relation to property lines and any other structures currently on the property with legible distances.
  - b. It must show the location of any overhead power lines.
  - c. It must show the legal address, the lot, and block numbers.
  - d. Important: the submitted site plan will be filed as a permanent record.
2. Aerial view of the roof. The following items must be included in the aerial view:
  - a. Distances to fencing and property lines.
  - b. Dimensions of all roof surfaces upon which modules will be installed.
  - c. Dimensions and locations of all required fire walk paths.
  - d. Dimensions and locations of all roof modules.
  - e. This document must be stamped, signed, and dated by the engineer.
3. Electrical calculations. This must show the actual Alternate Current (AC) and DC calculations for the proposed solar roof system.
4. Electrical one-line and or three-line drawings. These drawings must include:
  - a. Information on existing electrical distribution equipment including bus and main breaker rating.
  - b. Conductor sizing for all conductors.
  - c. The path for bonding and grounding system.
  - d. Conductors to roof modules and indicate if these conductors are AC or DC.

- e. The path from the electrical distribution system to modules. The installation method must be specified such as Non-Metallic (NM) cable through the attic, or Electrical Metallic Tubing (EMT) through the attic if the conductors will be installed inside the structure.
  - f. Location of point of interconnection. The location must be noted as the bus location at the point farthest from the main breaker if this is a breaker in an existing panel.
  - g. Method of interconnection to utility. This may be one of the following:
    - i. Load side in electrical panel must specify breaker size. Calculations must be included for sizing the interconnection breaker with respect to bus and main breaker ampacity.
    - ii. Load side as a tap on a feeder conductor.
    - iii. Line side in a new enclosure using service-listed components and terminating in a properly sized overcurrent protective device.
    - iv. Line side connections are only allowed in existing equipment when all the following requirements are met:
      - The existing equipment is designed and listed as Solar Ready.
      - The manufacturer must provide specific information regarding allowing a tap inside their enclosure and verify it does not alter the product listing or warranty.
      - With a field evaluation from an approved testing agency.
5. Labeling page showing all labels to be installed and where they will be installed.
6. Manufacturer's information on the following items:
- a. Roof Photovoltaic (PV) module: the module must be identified by marking, highlighting or otherwise identifying if not specific to the module to be used.
  - b. Inverter module: the module must be identified by marking, highlighting or otherwise identifying if not specific to the module to be used.
  - c. Combiner panel, if used.
  - d. Underlayment requirements for solar roof panels

7. Provide a letter from a Colorado licensed engineer with a roof evaluation for all roof surfaces modules are to be installed on. This evaluation must include the following information:
  - a. Name and address of engineer and or engineering company.
  - b. Address of project.
  - c. Roof components, including:
    - i. Roof structure materials such as 2 x 4 trusses on 24-inch center, 2 x 10 rafters, etc.
    - ii. Roof surface material such as asphalt shingles, concrete tile roof, metal roof, etc.
      - It must be noted as the inspection processes are different if the surface is concrete tile. An engineer's general compliance letter will be required at the time of final inspections.
  - d. Design criteria used for the evaluation, including:
    - i. 2021 IRC.
    - ii. 2020 NEC.
    - iii. All Arapahoe County [amendments](#).
    - iv. 115 mph Wind speed (3-second gusts).
    - v. 30 pound per square foot (PSF) non-reducible roof snow load.
  - e. The letter must state that the roof structure is adequate without reinforcement, no modifications are required or similar wording.
  - f. The engineer must include all calculation sheets required for the evaluation.
  - g. All required modifications to the roof structure must be specified and require an engineer's general compliance letter at the time of final inspections.
    - i. Roof structure materials such as 2 x 4 trusses on 24-inch center, 2 x 10 rafters, etc.

- ii. Roof surface material such as asphalt shingles, concrete tile roof, metal roof, etc.
- iii. Calculation sheets for all roof evaluations.

### **Important additional requirements for a successful inspection**

- Download, print and have the following documents ready for the inspector from the [Customer Access](#) portal:
  - A color copy of all final stamped permit documents (i.e., all the ones reviewed and approved – these documents are found in the Customer Access portal and will have the file name marked as “FINAL”).
  - A copy of the review comments.