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Permits & Inspection Services

A Guide to the Requirements of Building Permits for Photovoltaic Systems on Residential Buildings.

This guideline provides assistance in determining when Engineering may be required for installing Solar Photo Voltaic systems on the roofs of residential (Alberta Building Code Part 9) buildings

It is the responsibility of the owner to ensure the building is capable of withstanding the loads from the system being installed and the array is mounted in a manner that it will not be torn off in the wind. The solar PV array will add loads (Snow, Wind, Dead load from PV array weight) onto the building onto which it is installed. The building structure must have the ability to support those loads and/or reactions. In most cases these loads are relatively small.

In general, the weight footprint and height of a solar system determine the need for involving an engineer to design structural support elements. Engineers are to be involved where there is a need to reinforce the roof, the method of attaching the solar racking system onto the roof is by use of solar ballast or the installation is on a flat roof where there is a major obstruction such as a parapet or wall around the edge.

If the installation of solar modules on a roof of a residential building falls within the following conditions, then the addition of the solar array should not require additional structural support. This applies to both flat roof and sloped roofs and roofs of rafter or truss construction. Permit applicants are to confirm loads by completing a Structural Review Checklist

1. The roof must have been designed in compliance with Part 9 of the Alberta Building Code. Modern structures are built with factors of safety large enough to account for the relatively small loads imposed by a PV array. For older buildings or those built with non-standard construction practices, the structural members would need evaluation to ensure structural integrity.

2. The solar array's distributed (dead) weight is less than 5 pounds per square foot (24.4 kg/m2) and the roofing is a single layer of lightweight material (such as asphalt shingles, cedar shakes, or metal).

3. The solar module's connections to the roof result in the array's weight being uniformly distributed. The maximum point load shall be less than 50 pounds (22.7 kg) per roof connection.

4. The solar array will be mounted close to the surface of the roof with a maximum height of 18" (46 cm) above the roof surface. Modules must be below or flush to the roof ridge on sloped roofs and they cannot extend beyond the roof edges (i.e. eaves) on all sides of the building. Solar modules must not be installed on the overhang area of the roof.

5. The mounting structure is an engineered product specifically designed to mount solar modules to roofs. Racks must be installed with full compliance to the installation instructions provided by the supplier of the mounting structure.

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Structural Review Checklist for Residential Solar Panel Installations

Mounting system information

1. Is the Mounting system an engineered product designed to mount solar modules with no more than 18" below the module frames?

   Yes | No

   If no provide details of structural attachment certified by a design professional

2. For the racking system please fill out the information below:

   a. Total weight of modules and racking _____lbs / KG

   b. Total number of attachment points _____

   c. Weight per attachment point (a÷b) _____lbs / KG
   If greater than 50 lbs/22.5KG Provide engineering

   d. Maximum spacing between attachment points on a rail _____ Inches
   (See manufacturer's specifications for maximum spacing allowed based on wind speed and installation location on the roof area)

   e. Total surface area of PV Modules _____ SqFt

   f. Distributed Weight of installation (a÷e) _____ lbs/ft2
   If the distributed weight of the installation exceeds 5 lbs/ft2 engineering is required

Roof Information

1. Is the roof construction: Wood Truss | Rafter | Roof Joist | Other _____

2. Is the roofing type lightweight (Asphalt shingle, Wood shake, Sheet metal)? Yes | No
   If no, (Masonry, Slate, Ect.) provide engineering

3. Does the roof have a single roof covering? Yes | No
   If no, provide engineering

4. Provide type and method of weatherproofing roof penetrations (Flashing, Caulk, Butyl, ect.)

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Building Mounted Sustainable Technologies - Building Permit Application Checklist

Note: All applications must provide sufficient information to show that the proposed work will conform to the National Building Code-Alberta Edition and whether or not it may affect adjacent properties.

Please submit the following:

- Permit Application
  - Signature
  - Mailing Address
  - Contact Number
  - Email Address
  - Payment Method
  - Blue sign/Fire Number, Civic Address, Legal Description and/or Land Location
  - Building Use
  - Detailed Description of Work
- Development Permit *(if required by the Municipality. Check with your local jurisdiction).*
- Site Plan including property lines, north arrow and any other existing buildings or structures, and layout of solar panels
- Information about the building where the system will be installed including use and occupancy
- Information about the type of system to be installed including technical specifications from the manufacturer such as, mounting or racking details, solar panels specifications, locations of the system components (modules, meters, disconnect switches, batteries/storage, etcetera), CSA/ULC standards, and documentation for professional involvement *(if applicable).*
- Structural Details if structural modifications are being done
- Additional Information as required

Noteworthy Items

★ Plumbing and/or electrical permits may be required in addition to your building permit
★ Includes Green Roofs, Solar Hot Water, Photovoltaics, Cogen, Wind Turbines, Geoexchange Systems
★ For more information see the Safety Tip Brochures provided by the Safety Codes Council at www.safetycodes.ab.ca/permits-inspections/safety-tips/

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