CITY OF HELENA BUILDING DIVISION * 316 N. PARK* HELENA, MT * 406-447-8437

ALTERNATIVE ENERGY PLAN SUBMITTAL REQUIREMENTS

MINIMUM PLAN SUBMITTAL REQUIREMENTS FOR
SOLAR ELECTRIC, SOLAR WATER, WIND TURBINE, GEOTHERMAL OR
GROUND SOURCE HEAT PUMP SYSTEMS

SUBMIT A MINIMUM OF:

- **THREE (3) FULL SETS OF PLANS AND SPECIFICATIONS, INCLUDING SITE PLAN**

CURRENT APPLICABLE CODES:

2012 International Building Code (IBC)
2012 International Residential Code (IRC)
2012 International Mechanical Code (IMC)
2012 International Existing Building Code (IEBC)
2012 International Energy Conservation Code (IECC)
2012 International Fuel Gas Code (IFGC)
2012 Uniform Plumbing Code (IAMP)
2014 National Electrical Code (NEC)
2012 International Fire Code (IFC)

Codes have been amended and modified by State of Montana Administrative Rules (ARM's), Title 24, Chapter 301. Full text is available at http://www.mt.gov/dli/bsd/bc/rules.asp .

Indicate compliance with City of Helena City Code for all land use, infrastructure, zoning rules and regulations. Full text is available at http://www.sterlingcodifiers.com/MT/Helena/index.htm .

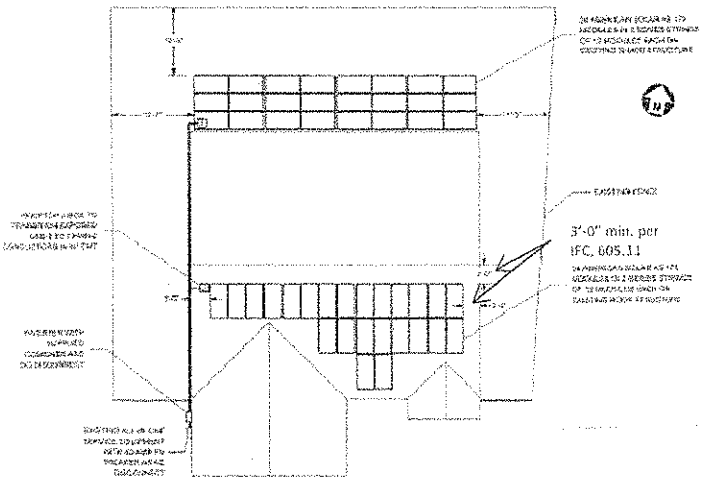
THE FOLLOWING INFORMATION MUST BE CONTAINED WITHIN YOUR SUMBISSION TO BE CONSIDERED A COMPLETE SUBMITTAL IN ORDER TO PROCESS YOUR PLANS IN A TIMELY AND CONSISTENT MANNER. INCOMPLETE SUBMITTALS WILL BE RETURNED TO THE APPLICANT UN-REVIEWED.

Electrical, mechanical and plumbing equipment specifications and installation data shall be on job site at time of rough and final inspections. No changes to equipment types, location within the building or general system design shall be made without prior approval by the Building Division based on letter from design engineer authorizing the requested changes and certifying such changes comply with the respective code.

INSPECTIONS: In order to see all components of a PV system, a rough in inspection will be required. The rough-in will be after the support system and wiring/grounding is rough installed and before the PV panels are installed and final connections are completed. This will provide: 1) access and inspection to the total project, including ladders and access to interior wiring and 2) facilitate corrections before the project is completed.

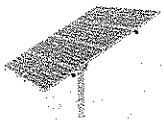
Plan Submission Requirements:

1. Site Plan Utility One-Call Locate - **811**
   - Legal description, property address and zoning district designation.
   - Property boundary dimensions and distances to the street curb and public walks.
   - Easements, covenants, or other use restrictions and encumbrances on the property.
   - Size and location of existing structures and distance to property boundaries.
   - Location of proposed alternative energy system relative to structures and property boundaries.
   - Location of all site utilities, electricity, gas, phone, cable, water and sewer services, vehicular access points to the property (curb approaches, etc.)

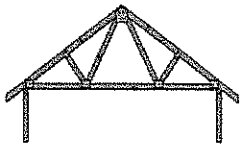


2. Architectural plans shall include foundation plan as applicable, floor plan and/or roof plan for the installation of system. Provide dimensions of roof and location of roof top system. Provide dimensions from all ridges, hip and valleys and from roof edges per IFC, Section 605.11. Floor plans shall indicate where system components will be installed within the structure. Provide location of new mechanical, plumbing and electrical equipment and shut-off devices.

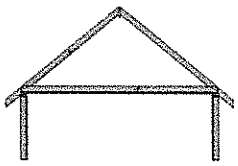
3. Provide plans, manufacturer's details and specifications for structural support of energy systems.



   a. Footing and foundation system for ground mounted systems shall be stamped by Montana licensed structural engineer. Provide details and dimensions of all foundation and support elements.



   b. For systems being installed on roof tops constructed with engineered, pre-manufactured roof trusses (metal plate trusses), provide manufacturer's specifications for solar panels, mounting system and anchorage, type of flashing. Provide dimensioned layout of components on roof. Identify location of all electrical components in relation to roof top system.



   c. For roof top systems being installed on a raftered roof system, provide a structural analysis prepared by a Montana licensed structural engineer indicating the existing roof system is adequate to support the proposed solar system. Analysis shall include verification of roof structure assembly, rafter sizes and span and anchoring method into the existing structural members.

4. Electrical plans, details, schedules and specifications shall be stamped by Montana licensed engineer or provide alternative energy system manufacturer's complete system specifications. Submitted information must indicate compliance with requirements of NEC.

   a. Provide complete single line diagram indicating number of modules per string. Show voltages and kilowatt outputs for each module as well as totals per string and overall totals.
   b. List all components of system, i.e. modules, combiners, disconnects, inverters. Include input and output ratings. Show sizing and overcurrent protection.
   c. Show size of main electrical service bussing, main breaker and PV circuit breaker. If grid tie in is to be other than main service, show feeder size, type and load center bussing and amperage.
   d. Show size and type of all raceways and conductors.
   e. Provide load calculations of residence (and load center if used as point of tie in).
   f. Provide auxiliary array grounding electrode and #6 bare copper conductors. Run conductor bare or sleeved in PVC and arrange so that no sharp bends are present. It is strongly suggested that the auxiliary electrode be bonded to the existing electrical system electrode system.
   g. Show size and type of all grounding and bonding conductors and raceways.
   h. On floor plan, indicate all locations of equipment and grounding points.
   i. Provide complete spec sheets of all equipment and hardware with complete electrical information.

   Additional Notes:
      i. All DC conductors shall be run in metal raceways.
      ii. Inverters that are not readily accessible shall require AC and DC disconnects within sight of and as close as practical to inverters.

5. Mechanical plans, details, schedules and specifications shall be stamped by Montana licensed engineer or provide alternative energy system manufacturer's complete system plans and specifications. Submitted information must indicate compliance with requirements of IBC and IMC.

6. Plumbing plans, details, schedules and specifications stamped by Montana licensed engineer or provide alternative energy system manufacturer's complete system plans and specifications. Submitted information must indicate compliance with requirements of IBC and UPC.

7. All components shall be labeled as required by IFC and NEC. Labels shall be permanently engraved plastic, minimum 3/8" high white letters on red background.

8. In addition to all applicable items above, all commercial installations require engineered drawings stamped by a Montana licensed PE.