City of Ione
Building Department
209.274.2412 / Ext 105

PHOTOVOLTAIC SOLAR CHECKLIST

Prior to City approval and issuance of PV solar permits, all of the following must be provided on submitted plans as is applicable to the proposed system and design.

Please note that the temperature correction factor for the City is 1.12.

- ☐ General
  - o Submit 3 sets of plans for residential systems and 4 sets for commercial, on minimum 11"x17" size paper.
  - o All plans must be drawn to scale, fully dimensioned, legible, and include all of the information noted below. Attaching this checklist to plans will not be approved as a substitute for complete plans.
  - o Design and installation must comply with the 2016 California Building Code (CBC), California Residential Code (CRC), California Electrical Code (CEC), and California Fire Code (CFC) as is applicable.
  - o All components and equipment used in the photovoltaic system must be installed in accordance with applicable listings and manufacturer installation instructions/specifications. Panels and modules shall be listed and labeled in accordance with UL 1703, and shall have a fire classification rating ≥ the roof covering.
  - o Cloud and/or highlight all revisions on revised plans.
- ☐ Cover sheet to include the following (min information):
  - o Project address (also on all other plan and manufacturer cut sheets).
  - o Owner's name, address, phone number. Include also on all equipment manufacturer cut sheets.
  - o Name, address, phone number, and signature of plan designer/preparer. Provide an engineer's seal and/or CSL# if by an electrical contractor, and/or if structural calcs/information is submitted with plans.
  - o A list of all applicable codes.
  - o Scope of work statement.
  - o Sheet index indicating each sheet title and number.
  - o Legend for symbols, abbreviations, and notations used in the plans.
  - o That a sturdy, *non-folding and non-telescoping* extension ladder will be in place, secured to, and extend above roof at least two feet, and be secured to roof to provide access for all inspections. Also, that the same type of ladder shall be in place and extend into the attic access for all attic inspections.
  - o Specify that the contractor will be present for all inspections, and have attic, and all equipment, disconnects, and main and subpanels panels open and ready for inspection prior to arrival of inspector.
- ☐ Provide an electrical single-line diagram identifying all devices in the system including the total kVA rating.
- ☐ Provide location of the main electrical service panel and subpanel(s), and amperage rating for each.
- ☐ Specify type and number of roof coverings, and method of water proofing all roof penetrations.
- ☐ Provide listing criteria for the method of and devices used for bonding PV modules.
- ☐ Conduit
  - o Show vertical and horizontal paths of all conduits to all equipment locations. Specify whether conduit is above or below roof.
  - o Labels shall be ≤ 10 feet apart, shall appear on every section of the wiring system that is separated by enclosures, walls, partitions, ceilings, or floors roof/ceiling assemblies per CEC 690.31(G)(4).
  - o Indicate type, size, and number of wires in each conduit.
  - o Specify that redlined as-built plans are required and will be submitted at the final inspection if changes in the approved conduit path shown are made during the project.
  - o Specify that conduits placed under the roof structure shall be a minimum 12 inch below the roof sheathing and above the ceiling insulation.
  - o Identify the methods, intervals, and clearances for supporting all roof and attic mounted conduit. Supports shall be listed for roof mounted conduit support, and shall not consist of wood or wood byproducts.
  - o Provide a conduit mounting detail specifying the standoff distance from conduits to roof covering.
  - o All ridged conduit shall be supported at maximum 10' intervals, and flex conduit installed in attics shall be supported at maximum intervals of 4.5 feet.

☐ (Over)

☐ IONE PHOTOVOLTAIC SOLAR CHECKLIST

- ☐ Provide manufacturer specifications and installation instructions for the modules, mounting systems, inverters, disconnects, transformers, batteries, generators, etc.
- ☐ Provide identification labeling and warning signage in conformance with CEC Article 690, and identify locations for all labels.
- ☐ Roof setbacks:
  - o Minimum setbacks from roof ridges, roofs with hip layouts, roof eaves and parapets to be 3' in accordance with local fire district requirements (for additional information, contact the local Fire Chief).
  - o Minimum setbacks from hips and valleys where panels and modules are placed on both sides of hips and valleys shall be 18".
- ☐ Backfeed breaker to be at end of buss bar at the furthest position from the main breaker per CEC 690.64 and 705.12(D)(2)(3)b). Signage is required adjacent to this breaker which states: "Do Not Relocate This Breaker".
- ☐ Per the 2016 CA Residential Code (CRC) § R314 & R315, 10 year battery smoke alarms shall be installed in each sleeping area and hallways leading to sleeping areas, and 10 year battery carbon Monoxide alarms shall be installed in hallways leading to sleeping areas. Access for verifying the installation of said alarms will be required at final inspection.
- ☐ Re load side taps (between meter socket and bus bar): Specify that wiring in existing panels will be neat and of a workmanlike manner. Taps shall be listed for the application, and approved by panel manufacturers. The amperage rating of the tap and conductor shall be equal to the combined existing loading and new solar loading.
- ☐ <u>Central/string inverters</u>
  - o Specify location(s) of inverters. If in side or rear yard areas, show related fences, gates, doors, etc.
  - o Specify that inverters not in line of sight of the main service pane (MSP)/PV OCPD, will have an AC disconnect adjacent to the inverter.
  - o When inverters are located in non-readily accessible areas/spaces (eg lockable garages, rooms, yards, etc) and/or within line of sight of MSP, provide placards with directional signage to inverters and MSP.
- ☐ <u>Grounding</u>
  - o Plans to identify the existing grounding system. If it is other than a concrete encased electrode (UFER), show that (2) ⅝" x 8' copper clad driven rod electrodes will be installed, that they will be driven flush with grade, a minimum of 6' apart, bonded together and connected to main panel grounding bus with unspliced solid copper conductor ≥ #8. Note on plans that if a UFER is used, contractor will provide visual onsite access for inspection.
  - o *Note: If proof of resistance to ground of 25 OHMs or less is provided, only one driven grounding electrode is required.*
  - o Specify that exposed main grounding electrode conductors (GEC) ≥ #4 copper and subject to damage will be protected by flex or rigid conduit. GE conductors ≤ #6 and not subject to damage can be secured to a structure.
  - o Specify that solar grounding will connect to the main grounding system by irreversible means.
  - ☐ <u>Structural</u>
  - o Roof plan to indicate the dimension and layout of the existing roof framing members.
  - o Show proposed placements/locations of all array supports.
  - o Demonstrate that roof mounted systems are designed for wind loads in accordance with CBC 1510.7.
  - o To avoid concentrated loads on roof structural members (trusses/rafters), stagger the placement of (other than ends) supports to said members, to properly distribute loads and avoid concentrated loading. Otherwise, provide engineering to verify that the roof structure is capable of supporting in-line supports.
  - o Provide total combined weight for all roof mounted equipment. Structural calculations by a licensed/registered CA design professional are required for the existing roof structure, if the total combined weight of the PV system exceeds 5 pounds per square foot.
  - ☐ <u>Ground-mount system</u>
  - o Include a plot plan showing the property boundaries, all buildings located on the parcel, easements, etc.
  - o Provide details for footings/foundation and structural frame work, including all dimensions, materials, fasteners, depths, and clearances.
  - o Provide structural specifications for panel support.
  - o Provide a clear brush free area ≥ 10' around PV arrays.
  - ☐ <u>Battery Installation</u>
  - o Provide floor plan of structure used to house battery bank.
  - o Indicate battery type, size, dimensions, ventilation, and protection from physical damage.
  - o Provide method for battery bank anchoring. Provide wiring diagram of battery set.