



# Photovoltaic (PV) Solar System Application and Checklist

## Systems $\leq$ 15KW (Expedited Review $\leq$ 3 Days)

### Planning & Zoning Department

Building Permit #: \_\_\_\_\_

Homeowner: \_\_\_\_\_ Phone #: \_\_\_\_\_

Contractor: \_\_\_\_\_ Phone #: \_\_\_\_\_

I, \_\_\_\_\_ have read the information below and acknowledge that all required documents have been provided. I understand that omissions in the required information will result in delays in the review process.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

#### **Items needed to complete the process:**

**Site Plan**

Provide a site plan drawing showing location of major components on the property. The drawing does NOT need to be exactly to scale, but it should represent relative location of components and show elevation. Setbacks for ground mounted systems must be shown.

**Construction Drawings**

Two (2) copies of plans showing PV array configuration, wiring system, overcurrent protection, inverter, disconnects, required signs, AC connection to building, and attachment detail for roof mounted or footing details for ground mounted.

**Spec Sheets & Installation Manuals**

Include specification sheets and installation manuals for all manufactured components including, but not limited to PV modules, inverters, combiner box, disconnects, and mounting system.

**Engineer's Report (IF NEEDED)**

Include engineer's report if needed (see *pages 2 and 3*).

#### **Steps to completing a PV Solar System project:**

**Step 1** | Review the [2011 Clay County Land Development Code \(LDC\)](#). Pay special attention to Section 151-6.3 (G) beginning on page 156.

**Step 2** | Concurrently submit this form to the Planning & Zoning Department and the Net Metering/Interconnection Application to appropriate electric utility.

**Step 3** | Work may commence after the permit is approved by Planning & Zoning.

**Step 4** | Notify Planning & Zoning when ready for inspection.

**Step 5** | Notify appropriate electric utility when inspection is passed.

**Step 6** | Electric utility will schedule its inspection and meter exchange.

**Step 7 | Electric utility will provide Permission to Operate (PTO).**

## Structural Review

### Roof Information:

This section is for evaluating roof structural members that are site built. This includes rafter systems and site built trusses. Manufactured trusses and roof joist systems, when installed with proper spacing, meet the roof structure requirements as well.

1. Are the solar panels to be mounted on a permitted roof structure?  Yes  No
2. Roof Age: Structure:  < 5 years  5-10 years  20-30 years  30+ years  
Covering:  < 5 years  5-10 years  20-30 years  30+ years
3. Type of roof covering material (e.g. asphalt, tile, wood, etc.): \_\_\_\_\_
4. Does the roof have a single covering?  Yes  No
5. Provide method and type of weatherproofing for roof penetrations (e.g. flashing, caulk)  
\_\_\_\_\_
6. Roof Construction:  Rafters  Trusses  Other: \_\_\_\_\_
7. Describe rafter or truss system:
  - a. Rafter Size: \_\_\_\_\_ x \_\_\_\_\_ inches
  - b. Rafter Spacing: \_\_\_\_\_ inches
  - c. Maximum unsupported span: \_\_\_\_\_ feet, \_\_\_\_\_ inches
8. Are rafters or trusses in good condition, i.e. have not been adversely altered and no visible damage?  Yes  No
9. Is the rafter or truss design unusual or abnormal?  Yes  No
10. Are the rafters or trusses made out of non-standard materials?  Yes  No
11. Have the rafters or trusses been modified in any way (e.g. drilled holes, etc.)  Yes  No

**Need a structural engineer's stamp:** If you answered "No" to question #8 or "Yes" to any of the questions numbered 9 - 11, a structural engineer's stamp will be required by Clay County verifying the roof can support the additional weight from the PV system. A framing plan is also required if strengthening the rafters/trusses is necessary.

**IMPORTANT NOTICE:** This application and checklist form does not constitute an approval of the engineering methods of any PV solar system nor its mounting techniques. Clay County, Missouri recommends that regardless of applicable building permit requirements, you should employ the professional services of a qualified Professional Engineer (P.E.) within the State of Missouri for the placement of any PV Solar System.

## Mounting System Information

This section provides information on how the PV modules will be mounted to the roof. It is very important to have enough attachment points to adequately spread the dead load across as many roof-framing members as needed so that the point loads created at attachment points account for additional snow load (the Kansas City region has a 20 psf ground snow load).

12. Is the mounting structure an engineered product designed to mount PV modules with no more than 18" gap beneath the module frames?  Yes  No

**Need a structural engineer's stamp:** If you answered "No" to question #12, a structural engineer's stamp will be required by Clay County. Must include design for uplift including system to rafter detail as well as a framing plan if strengthening the rafters/trusses is necessary.

13. Fill out information on the mounting system below: If info is listed on plans check here:

d. Mounting System Manufacturer: \_\_\_\_\_ Product Name & Model #: \_\_\_\_\_

e. Total Weight of PV Modules and Rails: \_\_\_\_\_ lbs \_\_\_\_\_

f. Total Number of Attachment Points: \_\_\_\_\_ lbs

g. Weight per Attachment Point (e ÷ f): \_\_\_\_\_ lbs

h. Maximum Spacing Between Attachment Points on a Rail : \_\_\_\_\_ inches

*See product manual for maximum spacing allowed based on maximum design wind speed.*

To ensure proper weight distribution: For each successive rail, attachment points should occur on rail ends and then staggered based on 16" or 24" on center rafter spacing.

i. Total Surface Area of PV Modules (square feet) : \_\_\_\_\_ ft<sup>2</sup>

j. Distributed Weight of PV Module on Roof (e ÷ i): \_\_\_\_\_ lbs/ft<sup>2</sup>

k. Mounting Frame to Rafter Framing:  Self-ballasted  Penetrating

If penetrating, please provide for fasteners:

Type: \_\_\_\_\_ Size: \_\_\_\_\_ Number: \_\_\_\_\_ Spacing: \_\_\_\_\_ inches

14. Additionally, please attach a cross-section detail that shows rafter size, spacing, number of attachment points, span dimensions, and approximate roof slope.

### **Electrical Review of PV System (Calculations for Electrical Diagram)**

In order for a PV system to be processed using this application, the following must be true:

1. PV modules, utility-interactive inverters, and combiner boxes are identified for use in PV systems.
2. The PV array is composed of 4 series strings or less per inverter.
3. The AC interconnection point is on the load side of service disconnecting means (690.64 (B))
4. A standard electrical diagram can be used to accurately represent the PV system.