



South Central Regional Construction Code Council

5058 W. Main Street Houma, Louisiana 70360
P.O. Box 1870, Gray, Louisiana 70359
Toll Free at 1-866-95-PERMIT or (985) 655-1070

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COMMERCIAL SOLAR PHOTOVOLTAIC SYSTEMS

Permit Plan Submittal & Code Requirements

Applicable Building Codes:

IBC	2015 International Building Code
NEC	2014 National Electrical Code

___ Electrical Plans with the following shall be included:

- a. ___ Location of main service or utility disconnect [NEC 80.21(Annex H)];
- b. ___ Total number of modules, number of modules per string and the total number of strings [NEC 80.21 (Annex H)];
- c. ___ Make and model of inverter(s) and/or combiner box if used [NEC 690.4(B)];
- d. ___ One-line diagram of system [NEC 215.5];
- e. ___ Specify grounding/bonding, conductor type and size, conduit type and size and number of conductors in each section of conduit [NEC 80.21 (Annex H)];
- f. ___ If batteries are to be installed include them in the diagram and show their locations and venting;
- g. ___ Equipment cut sheets including inverters, modules, AC and DC disconnects and combiners [NEC 80.21 (Annex H)];
- h. ___ Labeling of equipment as required by NEC Sections 690 and 705 [NEC 110.3(B)];
- i. ___ Site diagram showing the arrangement of panels on the roof or ground, north arrow, lot dimensions, and the distance from property lines to adjacent buildings/structures (existing and proposed) [NEC 80.21(Annex H)];
- j. ___ Plans shall include "Rapid Shutdown of PV systems on Buildings" per NEC 2014 Article 690.12 shall be applicable as follows:
 - ___ Requirements for controlled conductors shall apply only to PV system conductors of more than 5ft in length inside a building, or more than 10ft from a PV array;
 - ___ Controlled conductors shall be limited to not more than 30 volts and 240 volt-amperes within 10 seconds of rapid shutdown initiation;
 - ___ Voltage and power shall be measured between any two conductors and between any conductor and ground;
 - ___ The rapid shutdown initiation methods shall be labeled in accordance with 690.56(B);
 - ___ Equipment that performs the rapid shutdown shall be listed and identified.

___ Structural analysis by a "Licensed Engineer" shall be provided for solar panels, components and their loading on existing and new roofs [IBC 1607.12.5]. The intent of the letter or drawings has to relay that the existing framing has been viewed by the engineer and determined that it is capable of supporting the PV loads imposed with or without additional framing modifications.

___ Structural Plans and/or analysis shall include the following:

- a. ___ The type of roof covering and (if existing) the number of roofing layers installed;
- b. ___ Type of roof framing, size of members and spacing;
- c. ___ Weight of panels, support locations and method of attachment;
- d. ___ Framing plan and details for any work necessary to strengthen the existing roof structure;

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- e. ___ Any relevant calculations (when required);
- f. ___ Location of PV equipment on the building;
- g. ___ Where an approved racking system is used, provide documentation showing the manufacturer of the rack system, maximum allowable weight the system can support, attachment method to the roof or ground and product evaluation information or structural design for the rack system.

___ Roof Plan showing location of Modules/panels

___ Roof Plan with marked location of all adjacent openings such that roof access points are located in areas that do not require the placement of ground ladders over openings such as windows or doors and located at strong points of building construction in locations where the access point does not conflict with overhead obstructions such as tree limbs, wires or signs [IBC 1512.1 and IFC 605.11] – OR-

___ Elevation drawing or photo depicting opening location in wall in reference to location of on-roof module placements for compliance with “Roof Access Points” [IBC 1512.1 and IFC 605.11]

NOTE: **Group R-3:** Residential occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including Boarding houses, Care facilities, and congregate living facilities. Although Group R-3 also includes One & Two Family Dwellings and Townhouses, PV requirements for this type occupancy (One & Two Family Dwellings or Townhouses) can be regulated in accordance with the International Residential Code provided this type dwelling is NOT connected to any of the other Group R or Commercial occupancies (See separate check list for One & Two Family Dwellings and Townhouses).

___ Group R-3 – Size of PV array (max 150’ x 150’); multiple arrays shall be separated by 3-foot wide pathway [IBC 1512.1 and IFC 605.11]

___ Group R-3 – Hip roof layout: 3-foot clear access pathway from eave to ridge on each roof slope where panels and modules are located [IBC 1512.1 and IFC 605.11] (Exception: N/A where roof slope is 2:12 or less)

___ Group R-3 – Single-Ridge Roofs (Gables only): Minimum of two 3-foot clear access pathways from eave to ridge on each roof slope where panels or modules are located [IBC 1512.1 and IFC 605.11] (Exception: N/A where roof slope is 2:12 or less)

___ Group R-3 – Roofs with hips and valleys: PV panels/modules shall not be closer than 18 inches of hips or valleys where panels/modules are located on both sides of a hip or valley. No restrictions when panels/modules placed on only one side of the hip or valley [IBC 1512.1 and IFC 605.11] (Exception: N/A where roof slope is 2:12 or less)

___ Group R-3 Smoke Ventilation Requirements: PV panels/modules shall not be less than 3 feet from ridge to allow for fire department smoke ventilation operations [IBC 1512.1 and IFC 605.11]

___ Other than Group R-3 (All other Groups): Access to systems other than Group R-3 shall be in accordance with IBC 1512.1 and IFC 605.11. Exception: Where determined by code official that the roof configuration is similar to that of a group R-3 occupancy, then Group R-3 requirements may be used [IBC 1512.1 and IFC 605.11]

___ Other than Group R-3 (All other Groups): Roof Access: Minimum 6-foot wide clear perimeter around the edges of the roof [IBC 1512.1 and IFC 605.11]. Exception: Where either axis of the building is 250 feet or less, the clear perimeter around the edges of the roof shall be permitted to be reduced to a minimum 4 foot wide.

___ Other than Group R-3 (All other Groups): Pathways: centerline axis pathways shall be provided in both axes of the roof. Pathways shall be in a straight line not less than 4 feet clear to roof standpipes or ventilation hatches, roof access hatches, and not less than one roof access hatch with a singular pathway not less than 4 feet clear to a parapet or roof edge [IBC 1512.1 and IFC 605.11]

___ Other than Group R-3 (All other Groups): Smoke Ventilation: PV arrays shall not be greater than 150’ x 150’ on either axis. Smoke ventilation options between array sections shall be one of the following [IBC 1512.1 and IFC 605.11]:

- a. ___ A pathway 8 feet or greater in width;
- b. ___ A 4-foot or greater in width pathway and bordering roof skylights or gravity-operated dropout smoke and heat vents on at least one side;

- c. ___ A 4-foot or greater in width pathway and bordering all sides of nongravity-operated dropout smoke and heat vents;
- d. ___ A 4-foot or greater in width pathway and bordering 4-foot by 8-foot “venting cutouts” every 20 feet on alternating sides of the pathway.

___ Note: Roof Access Pathway requirements are not applicable for detached non-habitable Group U structures including, but not limited to, parking shade structures, carports, solar trellises and similar structure.