

INTERPRETATIONS & APPLICATIONS
OF BUILDING CODES & REGULATIONS 10-1



CODE SECTION : 2006 IBC 1609, ASCE7-05, Chapter 16

11/08/2010

SUBJECT: Photovoltaic Panels (Solar Panels) design & Installation Memorandum (Structural):

A. Design Wind Loads on Photovoltaic Panels (Solar Panels and Collectors)

The following wind load design methods shall be used when photovoltaic panels bear on or connect to a supporting structure or slab:

- For rooftop mounted panels, ASCE 7-05 Section 6.5.15 shall be used to determine for horizontal wind loads applied to the vertical projection of the roof top equipment. The additional factor for roof top mounted equipment per Section 6.5.15.1 shall also apply.
- For rooftop mounted and ground-mounted panels, ASCE 7-05 Section 6.5.13 shall be used to determine wind uplift on the panel normal to the surface of the panel.
- These sections do not need to be applied simultaneously.

Resistance to uplift loads shall be provided in accordance with the 2006 IBC Section 1605, Load Combinations or ASCE7-05 Chapter 2, "Combination of Loads".

B. Following is required for Photovoltaic panel submittals made prior to December 31st, 2010.

- This section applies to submittals that are already in the queue. This includes plans that may have received a review but are not permitted yet. However plans permitted after January 1st, 2011 shall comply with Part "C" below.
 - This section does not apply to Solar panel submittals that have been permitted.
1. Applicant shall contact the City to discuss submittal details. Please direct all contacts to Andre Darian, P.E., S.E. at: Tel. no. 480-312-7882; Email: adarian@scottsdaleaz.gov
 2. Photovoltaic panel design calculations, construction documents and installation manual. Design calculations shall comply with referenced codes listed in Part "A". Photovoltaic panels plans and calculations shall be sealed and signed by an Arizona registered professional engineer. Refer to note 4 for exceptions.

3. **An Arizona registered professional engineer shall review photovoltaic panel system and it's suitability to the supporting structural system, and shall seal and sign calculations and drawings for photovoltaic panels supporting structure. This engineer will be considered as Engineer of Records (EOR) for new construction.**
4. EOR shall verify that correct wind design load as specified in Part "A" above, is used in design of *photovoltaic panel* system.
Exception: City may accept photovoltaic panel frames designed for wind per ASCE 7-05 Section 6.5.12.4 however the existing structure and panel connections to existing structure shall be evaluated for wind loads derived from ASCE 7-05 Section 6.5.13.
5. Construction drawings shall specify exact geometry and location of photovoltaic panels on supporting structures. Existing or new framing location, size, and material and attachments shall be identified on drawings.
6. Where photovoltaic panels are to be installed on existing roofs or other structures, EOR shall verify that existing structure can support uplift forces, down forces as well as forces parallel with roof. Structural package shall include construction drawings where location of panels, support anchors, and ballast pans, etc. are clearly identified. Existing framing location, size, and material and attachments shall be identified on drawings.
7. Where panels are to be installed on new structures, EOR shall provide calculations to verify structural members can support photovoltaic panel loads. Structural submittal package shall include construction drawings where location of panels, support anchors, and ballast pans, etc. are clearly identified.
8. Members receiving photovoltaic panel loads shall be individually checked. Photovoltaic panel loads shall be applied as concentrated load, unless material provided to justify uniformly distributed load application.
9. Special Inspection may be required which will be discussed during initial contact. Refer to 2006 IBC Chapter 17 for additional information.

C. Following shall be provided for Photovoltaic panels submittals effective January 1st, 2011.

1. Photovoltaic panel design calculations, construction documents and installation manual. Design calculations shall comply with referenced codes listed in Part "A". Photovoltaic panels plans and calculations shall be sealed and signed by an Arizona registered professional engineer.
2. **An Arizona registered professional engineer shall review solar panel system and it's suitability to the supporting structural system, and shall seal and sign calculations and drawings for photovoltaic panels supporting structure. This engineer will be considered as Engineer of Records (EOR) for new construction.**

3. EOR shall verify that correct wind design load as specified in Part "A" above, is used in design of *photovoltaic panel* system.
4. Construction drawings shall specify exact geometry and location of photovoltaic panels on supporting structures. Existing or new framing location, size, and material and attachments shall be identified on drawings.
5. Where photovoltaic panels are to be installed on existing roofs or other structures, EOR shall verify that existing structure can support uplift forces, down forces as well as forces parallel with roof. Structural submittal package shall include construction drawings where location of panels, support anchors, and ballast pans, etc. are clearly identified. Existing framing location, size, and material and attachments shall be identified on drawings.
6. Where panels are to be installed on new structures, EOR shall provide calculations to verify structural members can support photovoltaic panel loads. Structural submittal package shall include construction drawings where location of panels, support anchors, and ballast pans, etc. are clearly identified.
7. Members receiving photovoltaic panel loads shall be individually checked. Photovoltaic panel loads shall be applied as concentrated load, unless documentation provided to justify uniformly distributed load application.
8. Special Inspection may be required. When required plans will be marked to notify applicant after initial review. Refer to 2006 IBC Chapter 17 for additional information.