SUBMITTAL REQUIREMENTS FOR ROOFTOP BALLASTED SOLAR PHOTOVOLTAIC SYSTEMS

The purpose of this document is to clarify submittal requirements for ballasted solar photovoltaic (PV) systems.

Ballasted systems are typically not attached to the roof and rely on their weight, aerodynamics, and friction to counter the effect of wind and seismic forces. In some cases, ballasted systems have few attachment points to supplement the friction forces.

A ballasted solar PV system can be used on flat roofs without a positive connection when the following requirements are met:

1. The seismic design of a solar ballasted PV system shall fully comply with Report PV1-2012 (www.seaoc.org) from the Structural Engineers Association of California (SEAOC). The displacement for unattached arrays can be determined by the following methods:

   A. Prescriptive design method per Section 7 of Report PV1-2012

   B. Nonlinear response history analysis per Section 9 of Report PV1-2012

   C. Shake table testing per Section 9 of Report PV1-2012

2. The wind design of a solar ballasted PV system shall fully comply with Report PV2-2012 (www.seaoc.org) from the SEAOC. The wind load design factor for unattached arrays can be determined by the following methods:

   A. Prescriptive pressure coefficient GCrn per Section 3 of Report PV2-2012

   B. Wind tunnel tests per Section 5 of Report PV2-2012

      - Option A with peer review - Provide peer review report and peer reviewer's qualification

      - Option B without peer review - A minimum wind design of not less than 65 percent of the value obtained from the prescriptive wind analysis based on Report PV2-2012; Provide a comparison table clearly demonstrating compliance with this ratio

3. A sliding test shall be performed by an approved test agency to determine the dynamic coefficient of friction having the same type of roofing material under critical roof slopes and dry/wet conditions. The tests shall conform to the applicable requirements of ASTM G115.

4. A load sharing engineering analysis or test report shall be provided to demonstrate that the interconnected modules are sufficiently rigid as to warrant load sharing assumption.

5. The Engineer of Record shall provide gravity load and lateral load analyses to justify that the addition of the ballasted solar PV system complies with Section 1607.12.5 of the Building Code and will not increase the demand on roof framing members by more than five percent and the demand on building lateral force-resisting system and elements by more than 10 percent per the Existing Building Code Sections 402.3 and 402.4. Otherwise, the building structural system shall be upgraded to comply with current code standards.

6. An alternate design approval pursuant to Section 104.2.8 of the Building Code is required for design based on this document.