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# DSA PROCEDURE #09-10

Issue Date: November 16, 2009

**To: DSA Regional Offices Staff  
Interested Parties**

**From: Division of the State Architect  
Department of General Services  
State of California**

**SUBJECT: Pre-Check (PC) Approval Process for Solar Design**

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- 1. Purpose and Goal:** The purpose of this procedure is to describe the DSA requirements for the submission of solar design for pre-check (PC) review and the processes DSA uses to approve such designs. The Solar PC program provides for DSA approval of the design in advance of submittal for specific school campus construction projects.

Once the Solar PC documents have been approved, they can be submitted with site specific project drawings. The review of a site specific project utilizing approved Solar PC documents will be completed within 45 calendar days of the receipt of a complete application per Education Code, Section 17282.5(b). Request for over-the-counter-review (OTC) of site specific projects may be granted if the criteria of [PL 07-02](#) are met.

**Note:** Solar PC approval is applicable to passive or active systems that include the solar panels, anchorages (of panels, components and equipment), and support frames. Building envelope is not part of the PC approval process.

## **2. Solar Pre-Check (PC) Submittal:**

- 2.1 Required Documents:** The required documents that need to be submitted for Solar PC approval are as listed on form [DSA-3 - Project Submittal Checklist](#) and [DSA-3 Form Instruction](#) may be found on the DSA website. Site specific information is not necessary as that information will be provided when a specific school campus construction project is submitted for DSA review.

- 2.2 Fee Deposit Requirement:** A deposit of \$3,000.00 is required when a Solar PC project is submitted for review. Final fees will be charged based on the number of hours to perform the review at the established hourly rates DSA determines each year for the reviewers' work. DSA will either refund part of the deposit or invoice for additional fees in excess of the deposit accordingly. If additional fees are required, payment must be received before the Solar PC plans are officially approved. The applicant may request an estimate of hours and fees prior to the start of review.

- 2.3 Revisions to Solar PC Designs:** Any revision to the approved Solar PC drawings without DSA review and approval automatically voids the Solar PC approval. If revisions are requested to a Solar PC approved design, a new Solar PC application, per Sections 2.1 and 2.2 above, is required, except that the fee deposit will be \$1,500. The revisions to the drawings and affected calculations need to be clearly indicated. The DSA plan reviewer will check only those portions of the design that are impacted by the revisions.

If errors or omissions are discovered in an existing Solar PC Design, they shall be corrected through this Solar PC Revision process.

- 2.4 Renewal:** Renewal of a Solar PC is required when a new California building code becomes effective or when significant code change occurs. The applicant must submit an application for renewal in accordance with Section 2.1 above. An initial renewal deposit is required per Section 2.2, except the amount will be \$1,500 for renewal.

- 3. **Design Requirements:** The design must comply with all the applicable Title 24 regulations, including energy.
- 3.1 **Structural Safety:** See [DSA IR 16-8](#). Solar design that uses proprietary support systems, connectors, anchorages, etc. must have product evaluation reports that comply with [DSA IR A-5](#).
- 3.2 **Fire Life Safety Requirements:** See DSA IR 16-8.
- 3.3 **Energy Requirements:** Solar PC for active systems connected to building’s plumbing or water heater shall comply with [DSA IR N-1](#) - PRE-CHECK (PC) DESIGNS - ENERGY COMPLIANCE REVIEW.

**Note:** Although energy reviewed may not be required for some solar PCs, it is required for all site specific projects.

- 4. **Solar PC Review:** File a separate solar PC application for each type of solar energy system. For example, submit one application for a photovoltaic system and a separate application for a solar thermal system. PC application should be limited to one or two options or schemes so that it meets the criteria for OTC review of the site specific projects using the PC. See DSA policy for over-the-counter review PL 07-02.
- 4.1 **Solar PC Review Priority:** PC plan reviews have equivalent priority as conventional project plan review submittals.
- 4.2 **Conflict Resolution:** If the applicant and the DSA plan reviewer could not reconcile their difference during plan review, the [Code Appeal Process](#) (PR 09-01) will be used to resolve disagreements.
- 4.3 **Information on Cover Sheet:** To expedite OTC and reviews of site specific projects using approved Solar PC documents, the following itemized information must be shown on the Solar PC drawings cover sheet, and if needed, continue on the sheets immediately following the cover sheet.
  - 4.3.1 All applicable codes and standards
  - 4.3.2 Complete PC specifications. Specifications submitted separately on paper size that is different from drawing size are not acceptable unless prior permission is secured from DSA. If permitted, the title sheet of PC drawing set shall show index of specifications and add the following statement:

“Complete specifications for this PC are listed on a separate document.”
  - 4.3.3 Structural design notes per CBC Section 1603A: See Appendix A for a sample template.
  - 4.3.4 Testing and Inspection Requirements: Testing and inspection are required for field install or constructed components such as support framing, anchor bolts, concrete foundations, etc. See Appendix C of [Procedure 07-01](#) for a PC Tests & Inspections Guideline. Delete the items that are not applicable.

For solar panels and BOS equipments manufactured by the manufacturer of the solar system, the project engineer shall verify the models, parts, and installation in accordance with DSA approved solar PC construction documents.
  - 4.3.5 Indicate whether or not the installation will be in a wildland-urban interface fire area per CBC Section 7.01A.3.2.

- 5. **Solar PC Approval:** All construction documents (plans and specifications) must be signed and stamped by the architect or structural engineer in general responsible charge in accordance with [IR A-19](#). Any portion of the work that was delegated to

another design professional must be stamped and signed by the architect or structural engineer and the design professional in accordance with IR A-18.

- 5.1 Solar PC Stamp-Out:** The final set of the Solar PC approved plans and specifications must show the regular DSA stamp (with the application identification and reviewers initial blocks) and the following PC stamp. These stamps could be pre-printed on the drawings and specification by the applicant.

**PRE-CHECK (PC) DOCUMENT**

**Code Version: 2007 CBC**

**A separate project application for construction is required.**

- 5.2 Record Sets:** A Record set of each approved Solar PC will be kept in the DSA files. A Solar PC design approved in one DSA Regional Office will be accepted in all other DSA Regional Offices without additional review. The PC design structural engineer or architect in general responsible charge shall follow the procedures outlined in DSA [Policy 06-01](#) regarding the creation of a Record Set by DSA and the return of original drawings and specifications. Form [DSA-145](#) must be signed and submitted along with the original documents prior to receiving final approval.

- 5.3 Revocation:** DSA reserves the right to revoke any Solar PC approval. The grounds for revocation include (but are not limited to) the following:

- 1) Approval was granted on the basis of incorrect or false information submitted.
- 2) The Solar PC design has demonstrated a history of unsafe or unsatisfactory performance.
- 3) Repeated structural modifications during fabrication or construction.
- 4) Any unauthorized deletions, additions, or alterations of any DSA approved plans or specification.
- 5) Expiration of required product evaluation reports per Section 3.1 above.

**6. Reference Hyperlinks:**

- DSA Submittal Checklist:  
[http://www.documents.dgs.ca.gov/dsa/forms/DSA-3\\_05-02-08.pdf](http://www.documents.dgs.ca.gov/dsa/forms/DSA-3_05-02-08.pdf)
- DSA Submittal Checklist Instructions:  
<http://www.documents.dgs.ca.gov/dsa/forms/DSA-3-INSTR.pdf>
- IR 16-8:  
[http://www.documents.dgs.ca.gov/dsa/pubs/IR\\_16-8\\_rev04-03-09.pdf](http://www.documents.dgs.ca.gov/dsa/pubs/IR_16-8_rev04-03-09.pdf)
- IR A-5:  
[http://www.documents.dgs.ca.gov/dsa/pubs/IR\\_A-5\\_rev06-02-08.pdf](http://www.documents.dgs.ca.gov/dsa/pubs/IR_A-5_rev06-02-08.pdf)
- IR N-1:  
[http://www.documents.dgs.ca.gov/dsa/pubs/IR\\_N-1\\_rev07-01-09.pdf](http://www.documents.dgs.ca.gov/dsa/pubs/IR_N-1_rev07-01-09.pdf)
- Code Appeal Process (CAP):  
[http://www.documents.dgs.ca.gov/dsa/pubs/PR\\_09-01\\_05-29-09.pdf](http://www.documents.dgs.ca.gov/dsa/pubs/PR_09-01_05-29-09.pdf)
- Policy 06-01:  
[http://www.documents.dgs.ca.gov/dsa/pubs/PL06-01\\_rev09-01-06.pdf](http://www.documents.dgs.ca.gov/dsa/pubs/PL06-01_rev09-01-06.pdf)
- DSA-145:  
<http://www.documents.dgs.ca.gov/dsa/forms/DSA145-0507RE.pdf>
- IR A-18:  
[http://www.documents.dgs.ca.gov/dsa/pubs/IR\\_A-18\\_rev07-01-09.pdf](http://www.documents.dgs.ca.gov/dsa/pubs/IR_A-18_rev07-01-09.pdf)

- IR A-19:  
[http://www.documents.dgs.ca.gov/dsa/pubs/IR\\_A-19\\_rev04-07-08.pdf](http://www.documents.dgs.ca.gov/dsa/pubs/IR_A-19_rev04-07-08.pdf)
- Procedure 07-01:  
[http://www.documents.dgs.ca.gov/dsa/pubs/PR\\_07-01\\_rev09-29-09.pdf](http://www.documents.dgs.ca.gov/dsa/pubs/PR_07-01_rev09-29-09.pdf)
- Policy 07-02:  
[http://www.documents.dgs.ca.gov/dsa/pubs/PL\\_07-02\\_rev\\_07-01-09.pdf](http://www.documents.dgs.ca.gov/dsa/pubs/PL_07-02_rev_07-01-09.pdf)

## Appendix A - Sample Design Template

### 2007 CBC Solar PC Structural Design Notes

Description	Design Values
<b>Dead and Live Loads</b>	
Live Load	
Dead load	
<b>Allowable Soil Pressure</b>	
DL (wood footing)	
DL+LL (wood footing - 1000 psf max)	
DL+LL+Snow (wood footing)	
DL+LL+Seismic (wood footing)	
DL+LL (concrete footing)	
DL+LL+Seismic concrete footing)	
<b>Snow Load</b>	
Ground Snow Load, $P_g$ , from County	
Roof Snow Load: <input type="checkbox"/> Flat, $P_s$ or <input type="checkbox"/> Sloped, $P_f$ , from County	
Snow Exposure Factor, $C_e$	1.2
Snow Load Importance Factor, $I$	<input type="checkbox"/> 1.0 <input type="checkbox"/> 1.1
Thermal Factor, $C_t$	1
<b>Flood Design</b>	
Flood Hazard Area: <input type="checkbox"/> Yes <input type="checkbox"/> No (If no, skip to Wind Design)	
Flood Hazard Map Used and Datum Elevation (from County)	
Lowest Floor Elevation	
Flood Proofing Elevation	
Lowest Structural Member Elevation (bottom)	

<b>Wind Design</b>	
Basic wind speed (3 Second gust), V (85 mph min.)	
Wind exposure factor:	<input type="checkbox"/> C <input type="checkbox"/> D
Topographic Factor, $K_{zt}$ (1 minimum)	
Wind load Importance Factor, I:	<input type="checkbox"/> 1.0 <input type="checkbox"/> 1.15
<input type="checkbox"/> Method 1 – MWFRS (Select and complete one method)	
Adjustment Factor, $\lambda$	
Simplified Wind Pressure, $p_{s30}$	
<input type="checkbox"/> Method 2 – MWFRS (Select and complete one method)	
Exposure category coefficient, $K_z$ or	
<b>Wind Design (cont)</b>	
Velocity Pressure Exposure Coefficient, $K_h$	
Internal Pressure Coefficient, $GC_{pi}$ (0.18 minimum)	
<input type="checkbox"/> Method 3 – IR 16-7 (Select and complete one method)	
Wind Directional Factor, $K_d$	0.85
Wind Velocity Pressure, $q_s$ (18.5 psf minimum)	
Velocity Pressure Exposure Coefficient, $K_z$	
<b>Seismic Design</b>	
Solar Component Seismic design category (SDC)	
Solar Component Seismic importance factor, $I_p$	
Solar Component Seismic Design Force, $F_p$ , per ASCE 7-05, Section 13.3.1	<input type="checkbox"/> D <input type="checkbox"/> E
Solar Component Amplification Factor, $a_p$	<input type="checkbox"/> 1.0 <input type="checkbox"/> 1.5
Solar Component Response modification factor, $R_p$	
Design spectral response acceleration at short period, $S_{DS}$	
Height, z, in structure of point of attachment of solar component with respect to the base of structure.	
Average roof height, h, of structure with respect to the base.	

Note: For additional information and instructions, contact DSA regional offices.