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## **PROCEDURE: ALTERNATE MEANS FOR PHOTOVOLTAIC (PV) PANEL REQUIREMENTS: CAMPUS PV SYSTEMS**

Division of the State Architect (DSA) documents referenced within this publication are available on the [DSA Forms](#) or [DSA Publications](#) webpages.

### **DISCIPLINE(S)**

Regional Intake and Headquarters Sustainability Unit

### **PURPOSE**

This procedure is to define the process for the submittal and review of K–12 School and Community College projects for which DSA has authority, requesting alternate means to the California Energy Code (CEC) regulations requiring Photovoltaic (PV) systems for all newly constructed buildings and is to be used in lieu of Procedure (PR) 18-01: *Request for Alternate Design, Materials and Methods of Construction* for this purpose only. This procedure describes the process for and the specific information required when an alternative to the CEC Section 140.10 are requested, based upon the availability of existing DSA certified campus solar systems with surplus power capacity.

### **BACKGROUND**

In 2022 the CEC requires that new PV systems are to be installed with all new buildings. Exemptions do not include the ability to transfer excess power generation from a campus sized PV array with surplus power capacity to a newly constructed building for the purpose to offset the PV requirements in the CEC. Energy Commission analysis indicated that schools were the leader in the effort to provide on-site power generation at a campus scale. School occupancies considered in the Energy Commission’s test cases, indicate a marginal return on investment. When new PV panels are added to an existing campus sized PV systems in excess of 10% of the existing campus PV system, it may trigger the transfer of all existing campus PV on the meter to NEM 3.0 reducing the return on investment for the new PV and the existing PV under the previous Net Energy Metering (NEM) agreement. Until rescinded DSA will, on a case-by-case basis, consider alternate means requests for campus PV systems pursuant to California Administrative Code (CAC) California Code of Regulations, Title 24 Part 1, Section 4-304.

### **PROCEDURE**

This procedure is to be used solely for the purpose stated herein.

Alternate means requests utilizing this procedure may not be made related to battery storage requirements required by 140.10 – Prescriptive Requirements for Photovoltaic and Battery Storage System.

The performance method per Energy Code Section 140.1 – Performance Approach: Energy Budgets, shall not be accepted for the purposes of this request.

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## ALTERNATE MEANS REQUIREMENTS TO PHOTOVOLTAIC PANEL REQUIREMENTS: CAMPUS PHOTOVOLTAIC (PV) SYSTEMS

### 1. REQUIREMENTS FOR AN ALTERNATE MEANS REQUEST

#### 1.1 Application for Approval

When a project is registered with DSA for project submittal (refer to *PR 17-03: Project Submittal Appointment Process*) the alternate design shall also be submitted to DSA utilizing the form *DSA 1-AMM-PV: Request for Alternate Design, Materials & Methods of Construction*. This will provide time for DSA to review the alternate means application and supporting documentation prior to the submittal date assigned the project. If rejected, will provide adequate time for the design professional to provide required building specific PV system design in the project documents prior to project submittal to DSA.

##### 1.1.1 Campus PV System Description

For the purposes of this procedure, campus PV systems are PV systems on K–12 and community college campuses, and which produce and provide power on a single campus or a portion of a single campus. Campus PV systems include but are not limited to all electrical components of that system including inverters and PV panels.

##### 1.1.2 PV Degradation

Photovoltaic panels degrade over time. The amount of degradation varies but the average degradation ranges from .3 percent to 1.6 percent per year depending on age/generation of the PV panels. For the purposes of campus PV system degradation, calculations shall include the manufactures published degradation factor. If manufacturer's information is not available degradation shall be assumed to be .8 percent per year.

##### 1.1.3 Required Information

The following documents are required to be submitted with the completed DSA 1-AMM-PV form.

**1.1.4** All calculations required to substantiate the amount of PV power required for the proposed new building(s) pursuant to the Energy Code section 140.10 – Prescriptive Requirements for Photovoltaic and Battery Storage Systems (i.e. SARA and Equation 140.10-A of the Energy Code). Refer to *Interpretation of Regulations (IR)-N-3: Energy Code Requirements for Photovoltaic and Battery Systems* for clarification;

**1.1.5** All calculations to substantiate existing campus PV system capacity;

**1.1.6** All calculations to substantiate equivalent calculated total existing campus photovoltaic direct current size.

**1.1.7** Prior 12 months of utility bills associated to the campus PV system or the annual true-up statement issued by the utility company if issued no more than one month prior to the date of the Alternate means request.

**1.1.8** Project Drawings: The project drawings submitted with the registration of the project may suffice for the purposes of this review if substantially complete and contain all necessary information to review the alternate means request including all previous application numbers related to the existing campus PV system.

**ALTERNATE MEANS REQUIREMENTS TO PHOTOVOLTAIC PANEL REQUIREMENTS: CAMPUS PHOTOVOLTAIC (PV) SYSTEMS**

**1.1.8.1** Electrical drawings must include a campus PV system calculation table indicating 1) total existing campus PV system capacity 2) equivalent calculated total existing campus photovoltaic direct current size connected to the campus solar power system. 3) surplus power generated by the campus solar power system, 4) required building PV System Size for the new building(s) under consideration, 5) calculated remaining surplus power generation after the new building PV required is factored in (See example below); 6) a note on the plans indicating that the existing campus PV system is fully functional and is operating as originally designed except that normal degradation is anticipated.

**1.1.8.2** Plans must also include an electrical site plan, indicating the location of all electrical main panels, conditioned floor area for each building, the location of all main electrical meter connected to the campus PV system, and a campus one-line diagram and date of original installation of the existing campus PV system.

Sample Campus PV System Calculation Table:  $f \geq 0$ , where  $a - b = c$ ; and where  $c - d = f$

Total Existing Campus PV System Capacity <sup>1,4</sup> (supply) (kW <sub>dc</sub> ) (a)	Equivalent Calculated Total Existing Campus Photovoltaic Direct Current Size (kW <sub>dc</sub> ) <sup>2</sup> (b)	Excess Campus Power (kW <sub>dc</sub> ) (c)	New Building Required PV System Size (kW <sub>dc</sub> ) <sup>3,5</sup> (d)	Final Surplus Campus Power (kW <sub>dc</sub> ) (f)

Notes:

- Existing PV system capacity shall be based on manufacture’s listed maximum output capacity for inverters and PV panels with any anticipated degradation. All PV systems used for the purpose of this alternate means must be summed and the appropriate degradation factor applied. All conditioned floor areas in all buildings on campus served by the existing campus PV system(s) must be summed.
- Calculation must be based on conditioned floor area calculation Equation 140.10-A. Uses not listed in Table 140.10-A shall be calculated using the most similar use listed in the table. SARA calculation for existing buildings shall not be used to calculate existing campus PV system capacity.
- The Required PV System Size in kW<sub>dc</sub> shall be not less than the smaller of the PV system size determined by Equation 140.10-A, or the total of all available solar access roof area (SARA) multiplied by 14 W/ft<sup>2</sup>.
- Resultant capacity of Equation 140.10 A shall be reduced by the degradation factor (DF) published by the panel mfg. The equation shall be:  
 $kW_{PVdc} = (\text{total CFA} \times A/1000 \times (1 - (DF \times (\text{current year} - \text{year installed}))))$   
 (e.g. 75,000 sq.ft. x 1.27W/ft<sup>2</sup> / 1000W/kW<sub>dc</sub> x (1 - .008 x (2023 - 2012)) = 86.868 kW<sub>PVdc</sub>).
- Must be 100 percent of the required PV system size as calculated per California Energy Code section 140.10.

## **ALTERNATE MEANS REQUIREMENTS TO PHOTOVOLTAIC PANEL REQUIREMENTS: CAMPUS PHOTOVOLTAIC (PV) SYSTEMS**

### **2. SUBMITTAL REVIEW**

Upon approval of the alternate means request, the electrical plans shall clearly indicate that the PV power required by the energy code is provided by the existing campus solar power system as approved by an alternate means request and any changes to the design related to the alternate means, after approval, to the main power service of the building shall be reviewed and approved by DSA prior to any work related to the alternate means request is initiated.

### **3. APPROVED ALTERNATE MEANS REQUESTS**

The project plans submitted to DSA review shall include all design related to the alternate means and shall include all items listed in Part 1.1.3.4 . A copy of the approved DSA 1-AMM-PV, all supporting documents and calculations shall be kept in the project file.

### **4. DISAPPROVED ALTERNATE MEANS REQUESTS**

The plans submitted for DSA review shall not use the disapproved alternate design and instead provide the design for project specific new solar PV system as required by the Energy Code.

#### **ADDITIONAL RESOURCES:**

- Form DSA 1 AMM-PV: Request for Alternative Design, Materials and Methods of Construction

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#### **REFERENCES:**

California Education Code  
Section 17280 through 17317, and 81130 through 81147  
California Code of Regulations (CCR) Title 24  
Part 1: California Administrative Code (CAC), Sections 4-304  
Part 6: California Energy Code, Sections 140.1, 140.10

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A DSA Procedure documents a process or series of steps that DSA staff and/or external stakeholders must complete in order to fulfill one or more administrative requirements of DSA's review and approval of plans and specifications and construction oversight programs.