

**DOCKETED**

<b>Docket Number:</b>	19-BSTD-12
<b>Project Title:</b>	Town of Truckee Petition to Solar PV Requirement
<b>TN #:</b>	234385
<b>Document Title:</b>	Truckee Title 24 Petition P-02-20-BSC
<b>Description:</b>	N/A
<b>Filer:</b>	Cheng Moua
<b>Organization:</b>	California Energy Commission
<b>Submitter Role:</b>	Commission Staff
<b>Submission Date:</b>	8/20/2020 9:10:30 AM
<b>Docketed Date:</b>	8/20/2020

**BUILDING STANDARDS COMMISSION**

2525 Natomas Park Drive, Suite 130  
Sacramento, California 95833-2936  
(916) 263-0916 FAX (916) 263-0959

February 19, 2020

*Via Email*

California Energy Commission  
Mr. Todd Ferris, Supervisor  
Standards Tools Development Unit, Efficiency Division  
1516 Ninth Street, MS-29  
Sacramento CA 95814-5512

RE: Petition P-02-20-BSC  
2019 Title 24, Part 6, Solar PV Requirements

Dear Mr. Ferris:

We are forwarding the enclosed petition dated February 11, 2020 received in our office via email on February 12, 2020 from Mr. Dan West of the Town of Truckee and Local Building Working Group. Their petition requests exemption from the solar PV requirements where high snow loads make compliance with the 2019 edition of the California Energy Code, Part 6 of Title 24 "routinely impossible or onerous." Specifically, an exemption is requested for building sites with ground snow loads above 223 psf, to be in effect until cost effective alternative options become available.

The petition request is being forwarded to the California Energy Commission (CEC) because CEC is the state agency with jurisdiction over the solar PV regulations contained in the California Energy Code (Part 6 of Title 24). The California Building Standards Commission does not have the authority to make an exception to the regulations within Part 6 without a request from CEC.

Also enclosed is a copy of our response letter to Mr. West, notifying him that this matter is being forwarded to CEC. We will continue to track this request. Should CEC determine that further action is warranted, please advise this office.

If you have questions or need further information, please contact me at (916) 263-0916.

Sincerely,



Michael L. Nearman  
Deputy Executive Director  
California Building Standards Commission

Enclosures

cc: CBSC Chron  
Mia Marvelli, CBSC  
Peter Strait, CEC  
Dan West, Petitioner

Craig Griesbach, Nevada Co. Director of Building  
Timothy Wegner, Placer Co. Deputy Director of Building Services  
Tim Beals, Sierra Co. Director of Planning & Building Official  
Tom Perry, Town of Mammoth Lakes & Mono Co. Building Official

**BUILDING STANDARDS COMMISSION**

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Sacramento, California 95833-2936  
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February 19, 2020

*Via Email*

Town of Truckee and  
Local Building Working Group  
Mr. Dan West, Building Division Supervisor  
10183 Truckee Airport Road  
Truckee CA 96161

RE: Petition P-02-20-BSC  
2019 Title 24, Part 6, Solar PV Requirements

Dear Mr. West:

This letter is to acknowledge our receipt of your petition and to advise you of our determination. Petitions regarding building standards received by this commission, and our review, are governed by the California Administrative Code, Part 1 of Title 24, Chapter 1, Article 3.

Your petition requests an exemption from the solar PV requirements where high snow loads make compliance with the 2019 edition of the California Energy Code, Part 6 of Title 24 "routinely impossible or onerous." Specifically, an exemption is requested for building sites with ground snow loads above 223 psf, to be in effect until cost effective alternative options become available.

Our determination is as follows:

Your petition is being forwarded to the California Energy Commission (CEC) because CEC is the state agency with jurisdiction over the solar PV regulations contained in the California Energy Code (Part 6 of Title 24). The California Building Standards Commission does not have the authority to amend the regulations within Part 6. Any request for an exemption from energy standards would need to be submitted to the California Building Standards Commission by CEC.

The CEC contact person is:

Todd Ferris, Supervisor  
Standards Tools Development Unit, Efficiency Division  
1516 Ninth Street, MS-29  
Sacramento CA 95814  
[Todd.Ferris@energy.ca.gov](mailto:Todd.Ferris@energy.ca.gov)

Mr. Dan West  
February 19, 2020  
Page Two

If you believe our determination is in error, you may elect to amend your petition and resubmit for our reconsideration. If you have questions or need further information, please contact CBSC at (916) 263-0916.

Sincerely,



Michael L. Nearman  
Deputy Executive Director  
California Building Standards Commission

Enclosure

cc: CBSC Chron  
Mia Marvelli, CBSC  
Peter Strait, CEC  
Todd Ferris, CEC

Craig Griesbach, Nevada County Director of Building  
Timothy Wegner, Placer County Deputy Director of Building Services  
Tim Beals, Sierra County Director of Planning & Building Official  
Tom Perry, Town of Mammoth Lakes & Mono County Building Official

## Petition to the California Building Standards Commission

Regarding Building Standards in Title 24, California Code of Regulations

### Instructions

1. Use this form to petition the California Building Standards Commission (CBSC) for the repeal, amendment or creation of a building standard pursuant to the repeal provisions in Title 24, Part 1, Article 3, California Administrative Code, detailed on page two of this form.
2. Attach additional sheets if necessary.
3. Mail completed form and all attachments to CBSC, 2525 Natomas Park Dr., Suite 130, Sacramento, CA, 95833-2936.

Note: This form is NOT to be used to comment on proposed building standards.

### Petitioner Information

Last Name West		First Name Dan	
Representing Local Building Working Group and Town of Truckee Building Division			
Mailing Address 10183 Truckee Airport Road		City, State CA	Zip Code 96161
Email Address dwest@townoftruckee.com			Phone Number (530) 582-2482

### Purpose of Petition (check as appropriate)

☐ Repeal Existing Building Standard    ☒ Amend Existing Building Standard    ☐ Create New Building Standard

If this petition proposes the repeal or amendment of existing building standards in Title 24, identify the part number(s) and section number(s).

Part 6	Section 150.1(b)1	Part 6	Section 150.1(c)14
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### Justification for Petition

1. Explain the problem and rationale for this petition. See page two Section 1-315(b).

High design snow loads make solar PV compliance "routinely impossible or onerous" (see attached letter).

2. Explain how the problem has statewide significance. See page two Section 1-315(a).

High SL could substantially damage PV systems, void warranties and be cost prohibitive (see attachments).

3. Is the problem giving cause for emergency action because of an imminent danger to public health, safety or welfare? See Section 1-317 on page two.    ☐ Yes    ☒ No    If yes, explain:

### Petition History

Have you previously petitioned CBSC or another state or local agency regarding this matter?

☐ Yes    ☒ No    If yes, explain below and attach a copy of the previous petition(s) and a copy of all related correspondence and decisions rendered.

### Attachments

If this petition has attachments, enter the number of pages attached: 2



## Regulatory References

A response to your petition will be provided in accordance with the petition provisions in the California Code of Regulations (CCR), Title 24, Part 1, California Administrative Code, Chapter 1, Article 3.

To assist in completing the petition, some applicable provisions have been provided below. However, the submitting petitioner(s) should review the full text of current regulations available online at the commission's website [www.dgs.ca.gov/bsc](http://www.dgs.ca.gov/bsc).

### Section 1-313. Petitions

(a) Any local governmental agency, firm or member of the public may petition either the Commission or the authoritative agency for the proposal, adoption, amendment or repeal of any building standard or administrative regulation in Title 24 of the California Code of Regulations.

(d) The Commission may refer received petitions to the state agency, or multiple agencies, having specific jurisdiction for the subject of the adopted building standard or for the subject of the proposed building standard as proposed by the petitioner. A state agency receiving a petition referred by the Commission shall process the petition as required by this Article, including the reporting of actions and decisions by the agency to the Commission.

(e) Petitions are not to be used to address matters relating to currently proposed buildings standards. Any concerns relating to currently proposed building standards should be brought forward during the public comment period designated for the proposed building standard.

**Section 1-315. Criteria for Petition** A petition for the adoption, amendment or repeal of a building standard must meet the following criteria:

(a) The subject issue must have statewide significance and must have implications for a whole category of projects or a broad range of project types, and:

(b) The rationale for the petition must take the form of at least one of the following criteria:

1. A current building standard conflicts with pertinent statute(s). To substantiate this criterion, the petitioner must cite the subject building standard and the conflicting statute(s), and provide a clear written description of why the two are inconsistent.
2. Compliance with a current building standard is routinely impossible or onerous. To substantiate this criterion, the petitioner must cite the current building standard, present written or photographic evidence of the difficulty in complying with it, and clearly show that the problem is common or potentially common to many different projects or project types in many different circumstances. This criterion shall not be used to justify a petition for the repeal or amendment of a current building standard that poses difficulty to a single project.
3. A current building standard is inefficient or ineffective. To substantiate this criterion, the petitioner must cite the subject building standard, provide clear and concise written or photographic evidence of its ineffectiveness or inefficiency, describe a proposed alternative, and provide clear and convincing written or photographic evidence that it is more efficient or effective.
4. A current building standard is obsolete. To substantiate this criterion, the petitioner must show at least one of the following facts:
  - A. A material or product specified in the building standards is not available, or
  - B. There is no statute authorizing the subject building standard, or
  - C. Significant developments in procedures, materials or other issues subject to the building standard have created a need for amendment or deletion of the building standard; that current state statutes permit amendment or deletion of the building standard; and that the building standard has the effect of prohibiting the use of a material or procedure that has demonstrated satisfactory performance and meets the intended purpose of building standards.
5. There is a need for a new building standard. To substantiate this criterion, the petitioner must provide a clear written description of the proposed building standard, explain why it is necessary, and cite the statute(s) that require or authorize the new building standard.

### Section 1-317. Emergency Petition

(a) A petitioner may assert that the petition requires immediate action because there is imminent danger to the public health, safety or welfare. To substantiate the existence of a potential danger, the petitioner must include in the petition a written description of the specific facts showing the need for immediate action.

(b) If the emergency petition is approved by the Commission and if the petition is accepted pursuant to this article, the proposing agency or adopting agency shall develop and/or adopt new or amended building standards necessary to satisfy the cause for the petition. The new or amended building standards shall be proposed and adopted as emergency building standards as permitted by Health and Safety Code Sections 18934.8 and 18937, and as provided for in section 1-419 of this chapter.

**Authority & Reference:** Health and Safety Code Sections 18931, 18934.8, 18937 and 18949.6. These provisions may be accessed at the California Legislative Information website: <http://leginfo.legislature.ca.gov/faces/home.xhtml>.



Town of Truckee  
Building & Safety  
 10183 Truckee Airport Rd.  
 Truckee, CA 96161  
 (530) 582-7821  
[www.townoftruckee.com](http://www.townoftruckee.com)



Nevada County  
Building Department  
 950 Maidu Avenue  
 Nevada City, CA 95959  
 (530) 265-1222  
[www.mynevadacounty.com](http://www.mynevadacounty.com)



Sierra County  
Building Department  
 101 Courthouse Square  
 Downieville, CA 95936  
 (530) 589-3251  
[www.sierracounty.ca.gov](http://www.sierracounty.ca.gov)



Mono County  
Building Department  
 POB 3569  
 Mammoth Lakes, CA 93546  
 (760) 924-1823  
[www.monocounty.ca.gov](http://www.monocounty.ca.gov)



Town of Mammoth Lakes  
Building Department  
 POB 1609  
 Mammoth Lakes, CA 93546  
 (760) 965-3630  
[www.townofmammothlakes.ca.gov](http://www.townofmammothlakes.ca.gov)



Placer County  
Building Department  
 3091 Counter Center Drive  
 Auburn, CA 95603  
 (530) 745-3010  
Tahoe Office - 775 North Lake Blvd  
 Tahoe City, CA 96145  
 (530) 581-6200  
[www.placer.ca.gov](http://www.placer.ca.gov)

February 11, 2020

California Building Standards Commission  
 2525 Natomas Park Drive, Suite 130  
 Sacramento, CA 95833-2936

### Petition for Exemption of Solar Photovoltaic Requirements for High Snow Load Areas

Our local Building Working Group and its member jurisdictions are highly supportive of the California Building Standards Commission and the California Energy Commission's efforts to reduce greenhouse gas emissions and promote the installation of photovoltaic systems.

Unfortunately, design snow loads for many building sites in the Sierra Nevada range are higher than the capacity of currently available PV panels. We are requesting an exemption from the California Energy Code requirement for solar PV where high snow loads make compliance "routinely impossible or onerous".

Roof snow loads are site specific and determined by the design professional. However, by assuming reasonable values for the snow load factors,  $p_s = 0.56 p_g$  can be used for a general sloped roof design snow load (see Tahoe Truckee Engineers Association February 2020 white paper). Some of the affected jurisdictions' maximum snow loads are listed in the table below:

Jurisdiction	Ground Snow Load, $p_g$ (psf)	Roof Snow Load, $p_s$ * (psf)
Town of Truckee	483	271
Nevada County	543	304
Placer County	545	306
Sierra County	563	316
Town of Mammoth Lakes	300	168
Mono County	285	160

\*Approximate, depending on site specific factors

It is our view that requiring the installation of PV panels which are not rated for the design roof snow load is in conflict with California Building Code Section 1604 General Design Requirements. Substantial damage to the PV system could result, warranties would likely be voided, and replacement would not be cost effective.

Currently we have identified three PV panel manufacturers that make panels with design snow load capacities of 125 psf (maximum capacities of 188 psf). Using our rule-of-thumb outlined above, this would equate to a ground snow load of 223 psf.

Therefore, we request an exemption from the solar PV requirements for building sites with ground snow loads above 223 psf, to be in effect until cost effective alternative options become available, such as:

- PV panels with higher snow load capacity
- Community shared solar electric generation system, or other renewable electric generation system, and/or community shared battery storage system (per Exception to Section 150.1(b)1).

Individual jurisdictions could, at their discretion, adopt offsetting energy efficiency requirements for those sites or buildings that would be granted this exemption.

Sincerely,

Dan West

Town of Truckee Building Division Supervisor and local Building Working Group

On behalf of:

Craig Griesbach, Nevada County Director of Building

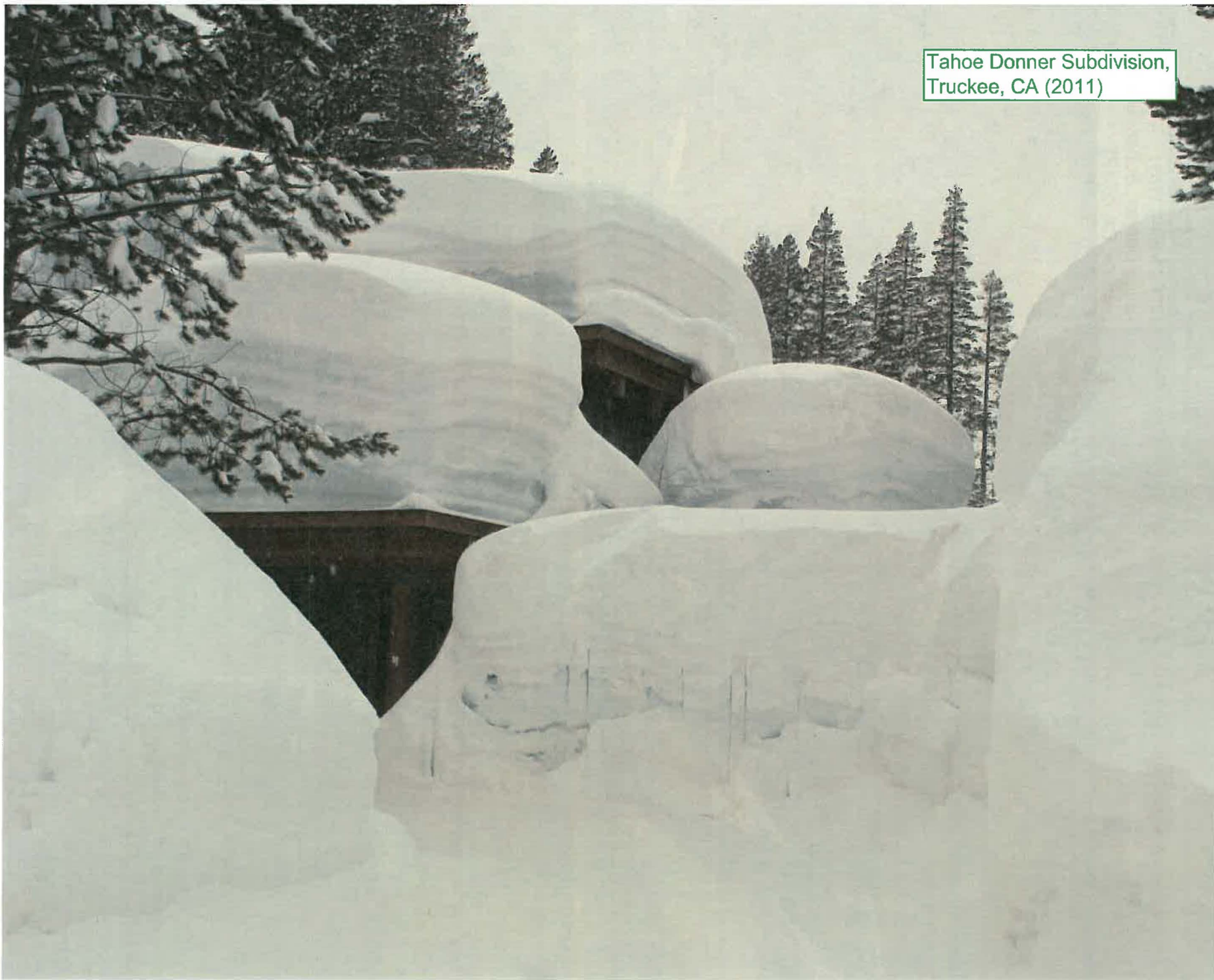
Timothy Wegner, Placer County Deputy Director of Building Services

Tim Beals, Sierra County Director of Planning & Building Official

Tom Perry, Town of Mammoth Lakes Building Official and Mono County Building Official



Tahoe Donner Subdivision,  
Truckee, CA (2011)



12102 Viking Way,  
Tahoe Donner, Subdivision,  
Truckee, CA (2017)



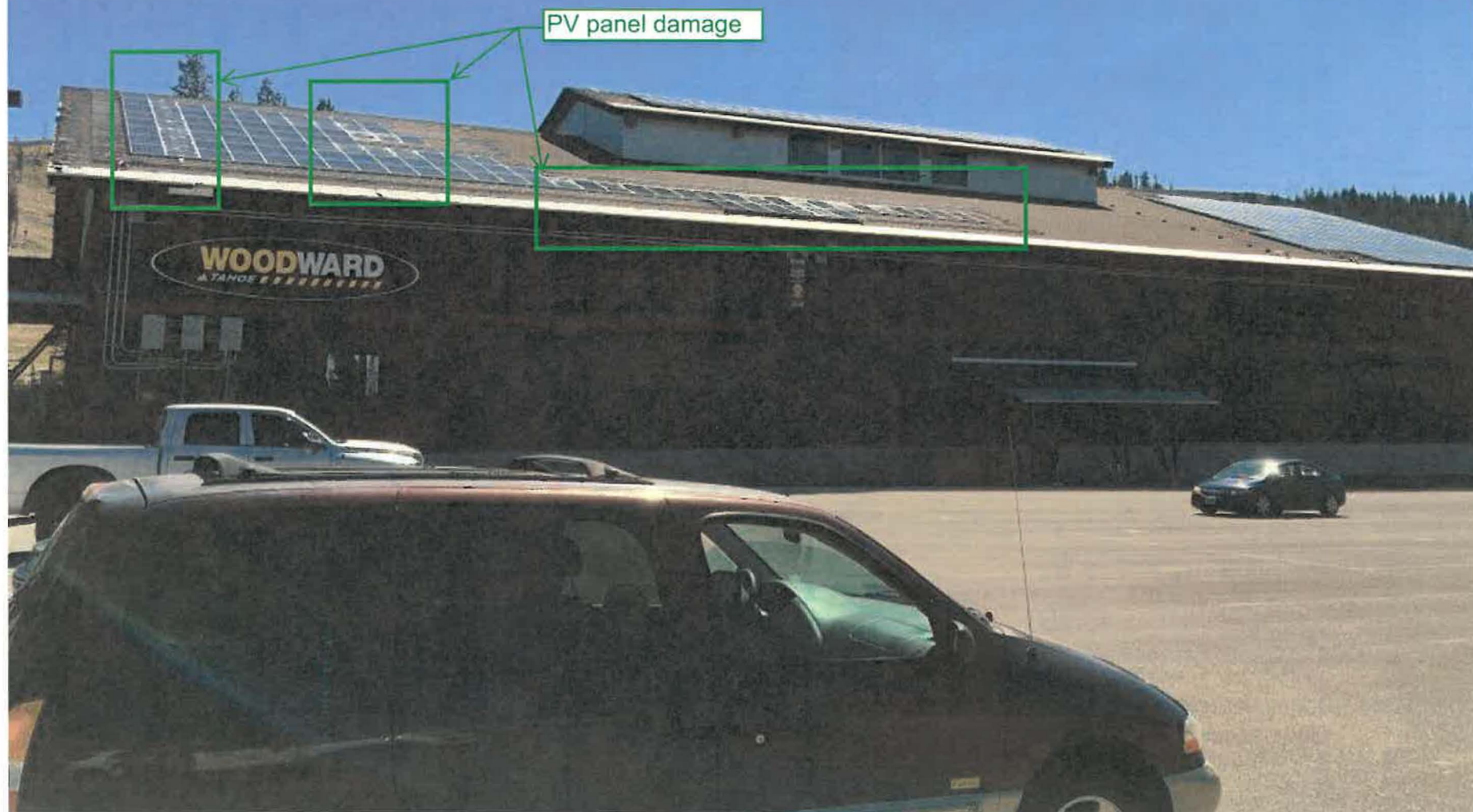


10975 Skislope Way,  
Tahoe Donner Subdivision,  
Truckee, CA (2017)





Woodward at Boreal  
Mountain Resort,  
Donner Summit,  
Nevada County, CA  
(2017)





# T T E A

Tahoe Truckee Engineers Association  
P.O. Box 851 Tahoe City  
California 96145

California Building Standards Commission  
2525 Natomas Park Drive, Suite 130  
Sacramento, CA 95833-2936

## **Snow Loads and Solar PV Requirements** (February 11, 2020)

Reference: 2019 California Energy Code (CEC) solar photovoltaic requirements, section 7.2.1 of 2019 Residential Compliance Manual. 2019 California Building Code (CBC) section 1604 and ASCE 7-16.

The members of the Structural Committee of the Tahoe Truckee Engineers Association (TTEA) have reviewed the above referenced requirements and present the following issues with implementing the installation of solar PV panels in high snow load areas.

### **GENERAL**

The California Energy Code requires the installation of solar PV panels on new residences. The California Building Code requires that the solar PV panels and their supports be designed to support the design loads as outlined in the code. In this case the design load is a snow load. Currently, with the available solar PV panels there is a conflict between these two code requirements in high snow load areas.

There are many jurisdictions throughout the state that have large design snow loads which exceed the capacity of currently available solar PV panels. In our area of the Northern Sierra Nevada range, we have design ground snow loads of up to 545 psf and down South up to 300 psf in the Town of Mammoth Lakes.

### **SNOW LOADS**

Snow loads are typically given as Ground Snow Loads ( $P_g$ ) that are then adjusted to roof snow loads as outlined in ASCE 7-16 Chapter 7. The flat roof snow load is determined from the following equation:

$$P_f = 0.7 \cdot C_e \cdot C_t \cdot I_s \cdot P_g \text{ (ASCE 7-16 Eq. 7.3-1)}$$

$P_f$  – Flat roof snow load

$C_e$  – Exposure factor (ASCE 7-16 Table 7.3-1)

Ct – Thermal factor (ASCE 7-16 Table 7.3-2)  
Is – Importance factor (ASCE 7-16 Table 1.5-2)  
Pg – Ground snow load (As determined by the local jurisdiction)

The flat roof snow load can be further adjusted for a sloped roof using the following equation:

$P_s = C_s * P_f$  (ASCE 7-16 Eq. 7.4-1)  
Ps – Sloped roof snow load  
Cs – Sloped roof factor.

For determining a general design snow load on solar PV panels, the following values are typical:

Ce = 1.0 (Partially exposed)  
Ct = 1.0  
Is = 0.8 (Risk Category I)  
Cs = 1.0 (Roof slope < 7/12, non-slippery)

Using the above noted values, a general sloped roof design snow load can be determined using  $P_s = 0.56 * P_g$ .

There are other factors that need to be considered for each site and roof configuration and the actual design roof snow load on any project must be determined by the design professional. However, for determining a base load where the installation of solar PV panels is routinely problematic or onerous we will use  $P_s = 0.56 * P_g$ . Since design snow loads are typically given as ground snow loads, we will note the base load in terms of ground snow loads as determined using the following equation:

$P_g = (1/0.56) * P_{s1}$  or  $P_g = 1.79 * P_{s1}$  where  $P_{s1}$  is the allowable load capacity of the solar panel.

## **SOLAR PV PANELS**

Most manufacturer's solar panels are rated for 113 psf to 125 psf with standard 2-rail mounting systems. Thus we have used 125 psf in determining the limit of an acceptable base ground snow load.

Using the equation above to determine a base ground snow load above which the installations of the solar PV panels are routinely problematic or onerous, we get a ground snow load of 223 psf.

## **CONCLUSION**

Currently, most solar PV panels are rated for 113-125 psf maximum snow load. Installing solar PV panels in areas where the design roof snow load is greater than 125 psf is a problem. The CBC requires that the solar PV panels and their supports be capable of supporting the design load. Where we have roof design snow loads above 125 psf, solar PV panel installation with commonly available solar panels is not possible without exceeding the manufacturer's tested ratings and potentially causing a failure of

the solar PV panels and/or supports and/or voiding any warranty given by the manufacturer of the panels.

Based on these issues we are requesting an exemption of the California Energy Code requirement for the installation of solar PV panels where the ground snow load exceeds 223 psf as determined by the local jurisdiction.

If you have any questions please contact our committee chair, Rick Fitzgerald, P.E. at (775) 848-0053 or by e-mail at [rick@fnwengineers.com](mailto:rick@fnwengineers.com)

Respectfully,

**TTEA Structural Committee**

Rick Fitzgerald, P.E. – Chair  
Dennis Dodds, P.E.  
Annie VonFelten, S.E.  
Darcey Messner, P.E.  
Paul Laudenschlager, P.E.  
Donavan Rae, P.E.  
David Hodder, S.E.  
Abe Haen, S.E.

Rocky Woods, S.E.  
Ron Mooiweer, P.E.  
Eric Bacon, P.E.  
Jay Garbarino, P.E.  
Doug Gadow, S.E.  
Daryl Mills, P.E.  
Brandon Brooks