



**No. 15-02
Electronic Snow Load Locator
(Ref.: ORS 455.060)**

Statewide Alternate Methods are approved by the Division administrator in consultation with the appropriate advisory board. The advisory board's review includes technical and scientific facts of the proposed alternate method. In addition:

- *Building officials shall approve the use of any material, design or method of construction addressed in a statewide alternate method;*
- *The decision to use a statewide alternate method is at the discretion of the designer; and*
- *Statewide alternate methods do not limit the authority of the building official to consider other proposed alternate methods encompassing the same subject matter.*

Code Edition: 2014 Oregon Structural Specialty Code (OSSC)
2014 Oregon Residential Specialty Code (ORSC)

Code Section: OSSC Section 1608, Snow Load
ORSC Section R301.2.3, Snow Loads, and Table R301.2(1)

Date: March 17, 2015 (Issued)
Nov. 18, 2015 (Updated)

Initiated by: Structural Engineer's Association of Oregon (SEAO)

Subject:

Use of the Oregon 2013 electronic Snow Load Map as created by the SEAO as an alternate method to the snow load provisions in the 2014 OSSC and the 2014 ORSC.

Background:

Shortly after publication of the 2007 edition of the *Snow Load Analysis of Oregon*, areas of Northwestern Oregon experienced record setting snowfall. The SEAO Snow Load Committee began reviewing the data in early 2009 to see if it would affect the 50-year mean recurrence interval (MRI) snow load at certain sites. After researching the snowfall from that winter, the committee found that the snowfall from that year at a number of mid-elevation sites exceeded those predicted on the map. They realized the 50-year MRI Station values for some locations were much lower than the surrounding snow load contour lines.

After researching the methods used for development of the 2007 map, the committee published a white paper explaining where the methodology needed to be revised and suggested an interim method to enable the use of the 2007 map. This was sent to everyone who purchased the 2007 Snow Load Manual and map. The 2013 electronic map is the result of the 2007 map modified by the white paper recommendations. The 2007 standard remains the prescriptive adopted reference for determining snow loads in accordance with Section 1608 of the OSSC and footnote "a" of Table R301.2(1) of the ORSC.



Discussion:

The mapping procedures for the 2013 snow load revisions provided for more accurate snow load values due to the refined field data and analysis. Snow data in the 2007 approach used a constant depth to density conversion, whereas the revised 2013 mapping uses the ASCE-7 method where density increases as depth increases. This made for small changes at lower and higher elevations but resulted in increases for the predicted snow load values at mid elevation sites.

Most of Northern Oregon saw record setting snow fall in 2007-2008. The station snow load and snow depth values are included in the new information. The recorded snow load data is used in the modeling program to give ground snow loads occurring in the state by dividing it into 4 kilometer square cells and calculating specific load values for each cell. The program accounts for elevation, rain shadows, coastal proximity, terrain configuration, temperature inversions and cold air pooling on precipitation and temperature. Provisions for dealing with micro climates within the state are included which involves submission of data and engineering analysis.

Conclusion:

Prescriptively, only use of the 2007 map is required by the OSSC and in footnote “a” of Table R301.2 (1) of the ORSC. The Structural Engineer’s Association of Oregon 2013 electronic Snow Load Map is a direct way to determine the snow loads from the combination of the 2007 map and the 2011 white paper recommendations. All information required for the proper use of the electronic map is contained on the SEAO website. The 2013 map is based on analysis procedures that better follow current snow load development standards. The 2013 map corrects the under-predicted snow load values at mid-elevations from the 2007 map.

Ground Snow Loads. The ground snow loads to be used in determining the design snow loads for buildings and other structures can be determined using the online lookup tool <http://snowload.seao.org/lookup.html> or the online map at <http://snowload.seao.org/mapserver.phtml>, published by the Structural Engineers Association of Oregon.

The design roof snow load shall not be less than 20 psf.

Exception: Based on local knowledge, the ground snow load may be adjusted by the building official when a registered design professional submits data substantiating the adjustments. The data shall be adjusted for a 50-year recurrence and shall include measured water equivalent of snow. This snow load data may then be used in potential accumulation calculations. However, in no case shall the adjusted ground snow load used for design be less than 20 psf.

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The technical and scientific facts for this Statewide Alternate Method are approved.

(Signature on File)

Mark Long, Administrator
Building Codes Division

March 23, 2015

Date