Agenda Item VII.C.

State of Oregon **Board memo**

Building Codes Division **August 6, 2008**

To: Building Codes Structures Board

From: Kristy Nielsen
Policy Analyst

Subject: OSSC Minimum Base Shear Equation Rule

Action requested:
Review draft permanent rule adopting minimum base shear equation

History:
In order to withstand earthquakes, Oregon's buildings must be constructed to withstand a certain level of seismic activity. ASCE 7-05, referenced in the 2006 International Building Code (IBC), provides the minimum base shear equation to be used when designing a structure. A study conducted by the Applied Technology Council (ATC), published in *ATC63, Quantification of Building System Performance and Response Parameter*, indicates that tall buildings (buildings 20 stories or taller) may fail at low seismic levels if built according to the base shear equation in ASCE 7-05 adopted by the 2006 IBC. In response, the American Society of Civil Engineers (ASCE) published ASCE 7-05 Supplement 2, which modifies the equation.

Discussion:
The division is concerned that the base shear equation referenced in the 2006 IBC does not provide adequate seismic safety for taller buildings. The updated shear equation in ASCE 7-05 Supplement 2 offers a more appropriate level of protection and therefore Oregon's adopted code should be amended to utilize the updated base shear equation.

On June 25, 2008, Building Codes Division issued temporary rules adopting the higher standard in ASCE 7-02 Supplement 2. This permanent rule would amend the OSSC to reference the new minimum base shear equation in ASCE 7-05 Supplement 2. The minimum base shear equation in ASCE 7-05 Supplement 2 actually restores the equation to its previous form, published in 2002. This code change is also being recommended by the International Code Council's (ICC) International Building Code, Structural Sub-committee.

Alternatives:

1. Approve the proposed permanent rule amending OAR 918-460-0015 for hearing and subsequent adoption unless substantially changed.
2. Disapprove the proposed rules and offer further direction to the division.

Recommendation:

Approve the draft rule for subsequent hearing and adoption, provided no substantial changes occur.

OSSC Shear Equation
Temp Rule Effective 6/25/08

918-460-0015

Amendments to the Structural Specialty Code

(1) The **Oregon Structural Specialty Code** is adopted and amended pursuant to chapter 918, division 8. Amendments adopted for inclusion into the **Oregon Structural Specialty Code** are placed in this rule, showing the section reference, a descriptive caption and a short description of the amendment.

(2)(a) Minimum base shear equation. Effective June 25, 2008 the referenced standard ASCE 7-05 in the Oregon Structural Specialty Code is amended as follows:

(b) The base shear equation 12.8-5 of ASCE 7-05 is deleted and replaced by the following base shear equation per ASCE 7-05 , Supplement No. 2: $C_S = 0.044 S_{DS} I \geq 0.01$

[Publications: Publications referenced are available for review at the division. See division web site for information on where to purchase publications.]

Stat. Auth.: ORS 447.231, 447.247, 455.030, 455.110 & 455.112
Stats. Implemented: ORS 447.247, 455.110 & 455.112
Hist.: BCA 18-1993, f. 8-24-93, cert. ef. 8-29-93; BCA 28-1993, f. 10-22-93, cert. ef. 1-1-94; BCD 6-1994, f. 2-25-94, cert. ef. 5-1-94; BCD 22-1994, f. 9-28-94, cert. ef. 1-1-95; BCD 31-1994(Temp), f. & cert. ef. 12-23-94; BCD 32-1994, f. & cert. ef. 12-30-94; BCD 2-1995, f. & cert. ef. 2-9-95; BCD 5-1995, f. & cert. ef. 3-15-95; BCD 2-1996, f. 2-2-96, cert. ef. 4-1-96; BCD 6-1996, f. 3-29-96, cert. ef. 4-1-96; BCD 12-1997, f. 9-10-97, cert. ef. 10-1-97; BCD 19-1998, f. 9-30-98, cert. ef. 10-1-98; BCD 24-1998(Temp), f. & cert. ef. 12-1-98 thru 5-29-99; Temporary Rule repealed by BCD 3-1999, f. 3-12-99, cert. ef. 4-1-99; BCD 5-1999, f. 6-17-99, cert. ef. 10-1-99; BCD 12-1999(Temp), f. 9-23-99, cert. ef. 11-1-99 thru 4-28-00; BCD 2-2000 f. 1-14-00, cert. ef. 4-1-00; BCD 20-2000, f. 9-15-00, cert. ef. 10-1-00; BCD 8-2001, f. 7-17-01, cert. ef. 10-1-01; BCD 18-2001, f. 12-21-01, cert. ef. 1-1-02; BCD 14-2003, f. 8-13-03, cert. ef. 10-1-03; BCD 18-2003(Temp) f. & cert. ef. 11-14-03 thru 5-11-04; BCD 5-2004,f. & cert. ef. 4-1-04; BCD 16-2004, f. 9-24-04, cert. ef. 10-1-04; BCD 21-2004, f. & cert. ef. 10-1-04; BCD 9-2005(Temp), f. & cert. ef. 4-7-05 thru 9-30-05; BCD 14-2005, f. & cert. ef. 7-5-05; BCD 18-2005(Temp), f. & cert. ef. 7-12-05 thru 9-30-05; BCD 22-2005, f. 9-29-05, cert. ef. 10-1-05; BCD 23-2005, f. 9-29-05, cert. ef. 10-1-05; BCD 1-2006, f. & cert. ef. 2-1-06; BCD 9-2006, f. 6-30-2006, cert. ef. 7-1-06; BCD 1-2007, f. 2-15-07, cert. ef. 4-1-07; BCD 9-2008 (Temp), f. & cert. ef. 6-25-08 thru 12-22-08