



# Structural Engineers Association of Massachusetts

## Design of Vertical Bracing Connections in the Seismic Regime

### The Last Bastion of Rational Design

### Steel: From the Green Book to the Black

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Sign up for a full day with two exciting speakers, or sign up for a half-day session in the morning or afternoon.

**WEDNESDAY**

**MARCH 24, 2010**

**Marriot Boston-Newton**

2345 Commonwealth Ave.  
Newton, MA

8:00-8:45AM	Registration with Food Service
9:00-10:30AM	Presentation
10:30-10:45AM	Break
10:45AM-12:15PM	Presentation
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12:15-12:30PM	Registration for Afternoon Session
12:30-1:00PM	Lunch with Food Service
1:15-2:15PM	Presentation
2:15-2:30PM	Break
2:45-4:00PM	Presentation

Up to 6 PDH's (Professional Development Hours) are available.

### Morning Program

#### Connections

Dr. William A. Thornton, P.E.

#### DESIGN OF VERTICAL BRACING CONNECTIONS IN THE SEISMIC REGIME

1. Design of bracing connections for ductile seismic performance involves many design and detailing requirements not commonly addressed in non-seismic design. The use, abuse, and cost of these requirements will be discussed. Specific items of discussion are:
  - A. Seismic compactness requirements;
  - B. Brace buckling direction and its effect on gusset design;
  - C. The effect of high seismic drift; and
  - D. The treatment of the resulting distortional forces.
2. Methods to determine the distortional forces and to control their magnitude will be presented.

#### THE LAST BASTION OF RATIONAL DESIGN (The Art and Science of Connection Design)

Connections have been referred to as the "Last Bastion of Rational Design" because there is very limited software available for design. Therefore, engineers need to understand fundamentals of connection design. Because of the widespread use of software for structural design a well-known engineer in the UK has stated, "Any fool can design a structure. It takes an engineer to design a connection."

1. This session will present the fundamental basis for connection design and will include the effects of mainframe design on connections, bolt and weld choices, analysis assumptions and reality, and the Lower Bound Theorem of Limit Analysis.
2. Applications to selected shear, bracing and moment connections will be presented.



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## Afternoon Program

### “Steel: From the Green Book to the Black”

Mr. Erik Nelson, P.E.

Last year Erik decided to shelve his Green Book because it was too tempting, and learn the latest updates of the Black book. Remember, it has already been over 20 years since the 1989 Green Book.

1. Examine changes that led to the LRFD and the new ASD methodologies of the 2005 AISC 13<sup>th</sup> Edition Manual (“Black Book”) which resulted in the *unfortunate* change from stress to strength but the benefit of a unified approach.
2. Research that improved and updated the steel code since the AISC-ASD 9<sup>th</sup> Edition (“Green Book”) and the AISC-LRFD 3<sup>rd</sup> Edition will be highlighted.
3. Updates to the specifications on tension, compression, flexure, and connections which will highlight the important changes that should be used in design of new steel structures.

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**William A. Thornton PhD, P.E.** is Corporate Consultant to Cives Corporation of Roswell, Georgia. A member of ASCE, AWS, and RCSC and has been chairman of the AISC Committee on Manuals for the last 20 plus years.

**Erik Nelson, P.E.** is a principal of Structures Workshop, Inc., a full service structural engineering firm located in Providence, Rhode Island. He is an adjunct professor at the Rhode Island School of Design and University of Massachusetts, Dartmouth where he currently teaches courses on steel design. Erik is the Vice President of the of the Structural Engineers Association of Rhode Island (SEARI) and a registered professional engineer in Rhode Island, Massachusetts, Connecticut, New Hampshire, Maine and New York. Erik Nelson holds a masters degree from M.I.T. (Structural Engineering) and two bachelors’ degrees from Lake Forest College (Physics) and Washington University in St. Louis (Civil Engineering).

### Structural Engineers Association of Massachusetts

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\_\_\_\_\_ Name

\_\_\_\_\_ Company

\_\_\_\_\_ Address

\_\_\_\_\_ Phone

\_\_\_\_\_ Email (Fax, if no email)

Registration by \_\_\_\_\_  
(you must register to attend)

*Please mail payment and this registration form to the SEAMass address to the left. You will receive an email or fax confirmation of your attendance. If you must cancel, please do so by \_\_\_\_\_. If you do not cancel and cannot attend, we will have to charge you for the meeting as we will be charged for the hotel.*

		SEAMASS BASE NECSEA Student	Non-Members
Half Day Morning:	9:00AM-12:15PM	\$75	\$85
Half Day Afternoon	12:15-4:00PM	\$75	\$85
Full Day:	9:00AM-4:00PM	\$95	\$105