

# steel quiz

We're shaking things up, as Steel Quiz becomes Seismic Quiz this month.

- 1 LRFD Load Combination #6 in ASCE 7-16 can be expressed as shown below. Indicate which expression would be used when overstrength is included:
- a.  $1.2D + E_v + E_{mh} + L + 0.2S$
  - b.  $1.2D + E_v + E_h + L + 0.2S$

- 2 **True or False:** Per the AISC *Seismic Provisions for Structural Steel Buildings* (ANSI/AISC 341-16),  $E_{mh}$  need not be taken larger than  $E_{cl}$ .
- 3 For the lateral force-resisting system shown in Figure 1, indicate which members buckle, which members yield and which members remain nominally elastic.

- 4 When checking LRFD Load Combination #6, please indicate which of the below expressions could be applied when designing each of the members indicated in Figure 2. (Assume OCBF and SCBF—ordinary concentric braced frame and special concentric braced frame, respectively.)
- a.  $1.2D + E_v + E_h + L + 0.2S$
  - b.  $1.2D + E_v + E_{mh} + L + 0.2S$
  - c.  $1.2D + E_v + E_{cl} + L + 0.2S$

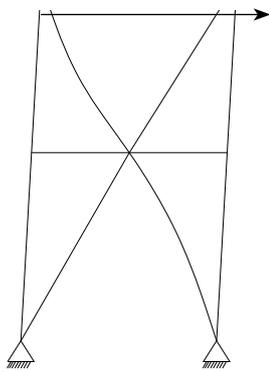


Figure 1

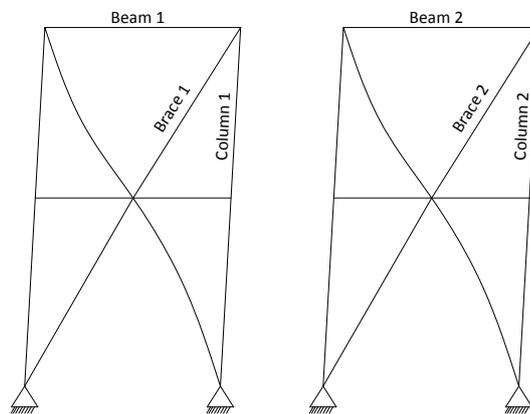


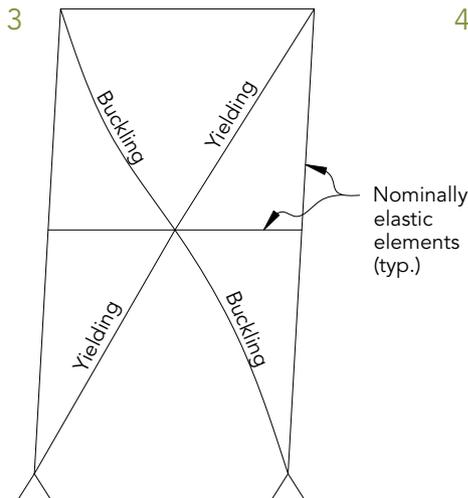
Figure 2

TURN PAGE FOR THE ANSWERS.

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## ANSWERS

- 1 **a.**  $E_{mh}$  is used when overstrength is included.  $E_{mh} = \Omega_0 Q_E$
- 2 **True.** A user note in Section B2 in the *Seismic Provisions* (available at [www.aisc.org/specifications](http://www.aisc.org/specifications)) states that  $E_{mh}$  "need not be taken larger than  $E_{cl}$ " where  $E_{cl}$  represents the capacity-limited horizontal seismic load effect.



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OCBF	SCBF
Brace 1: <b>a</b>	Brace 2: <b>a</b>
Beam 1: <b>b</b> or <b>c</b>	Beam 2: <b>c</b>
Column 1: <b>b</b> or <b>c</b>	Column 2: <b>c</b>



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Anyone is welcome to submit questions and answers for the Steel Quiz. If you are interested in submitting one question or an entire quiz, contact AISC's Steel Solutions Center at 866.ASK.AISC or at [solutions@aisc.org](mailto:solutions@aisc.org).