

PROPOSAL 6-3 (2009)

SCOPE: Part 1 of the 2008 Provisions

PROPOSAL FOR CHANGE:

- 1 **1) Delete lines B.2 and B.25 from Table 12.1-1 of ASCE 7-05.**
2 **Modify the names of the Seismic Force Resisting Systems in**
3 **lines B.1 and B.26 to read as follows:**

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5 **Line B.1 “Steel eccentrically braced frames”**

6 **Line B.26 “Buckling-restrained braced frames”**
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10 **2) Modify Section 15.7 of AISC 341-05 as follows:**

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12 **15.7. Beam-to-Column Connections**

13 Beam-to-Column Connections away from the link shall be designed as either
14 moment resisting connections or as connections that can accommodate at least a
15 total rotation of 0.02 radians.

16 ~~If Where the EBF system factors in the applicable building code require~~ moment
17 resisting connections are provided away from the link, then the beam-to-column
18 connections ~~away from the link~~ shall meet the requirements for FR Ordinary
19 Moment Connections ~~beam to column connections for OMFas~~ specified in
20 Sections 11.2-2a and 11.2c and 11.5.

21 ~~If the EBF system factors in the applicable building code do not require moment~~
22 ~~resisting connections away from the link, then the beam-to-column connections~~
23 ~~away from the link are permitted to be designed as pinned in the plane of the~~
24 ~~web.~~

1 **3) Add Section 16.7 to AISC 341-05 as follows:**

2 **16.7 Beam-to-Column Connections**

3 Beam-to-Column Connections shall be designed as either moment resisting
4 connections or as connections that can accommodate at least a total rotation of
5 0.02 radians.

6 Where moment resisting connections are provided, then the beam-to-column
7 connections shall meet the requirements for FR Ordinary Moment Connections
8 as specified in Sections 11.2a and 11.2c and 11.5.

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11 **Commentary**

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13 ASCE 7-05 included two different systems for both Eccentrically Braced Frames (EBF) and
14 Buckling Restrained Braced Frames (BRBF). The primary distinction between these two systems
15 was whether or not there were moment resisting beam-column connections within the braced
16 bays. Recent testing at UC Berkeley (Uriz and Mahin, 2004) has indicated that designs that do
17 not properly account for the stiffness and distribution of forces in braced frame connections may
18 be subject to undesirable performance. This proposal consolidates the EBF and BRBF building
19 frame systems into a single designation, with proper consideration of the beam-column
20 connection demands. The proposal allows the engineer to either provide a fully restrained
21 moment connection meeting the requirements for Ordinary Moment Connections in AISC 341-
22 05, thereby directly providing a load path to resist the connection force and deformation
23 demands, or to provide a connection with the ability to accommodate the potential rotation
24 demands. An example of this would be a configuration tested at Lehigh University (Fahnestock,
25 et. al. 2006), shown in Figure 1 that effectively formed a pinned condition in the beam just
26 beyond the beam-column-brace connection.

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28 References:

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30 Uriz, Patxi and Mahin, Stephen A., *Seismic Performace Assessment of Concentrically Braced*
31 *Steel Frames* 13th World Conference on Earthquake Engineering; Vancouver, B.C., Canada;
32 August 1-6, 2004; Paper No. 1639.

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34 Fahnestock, Larry A. Ricles, James M. and Sause, Richard, *Experimental Study of a Large-Scale*
35 *Buckling Restrained Using the Psudo-Dynamic Testing Method*, Proceedings of the 8th National
36 Conference on Earthquake Engineering, San Francisco, CA, April, 2006.

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39 **REASON FOR PROPOSAL:**

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41 See Commentary above.