

## PROPOSAL 6-3 (2009)

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### SCOPE: Part 1 of the 2009 Provisions

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#### PROPOSAL FOR CHANGE:

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

Line B.1       “Steel eccentrically braced frames”  
Line B.26      “Buckling-restrained braced frames”

- 2) **Modify Section 15.7 of AISC 341-05 as follows:**

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

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

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

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

#### **16.7 Beam-to-Column Connections**

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

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

#### Commentary

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

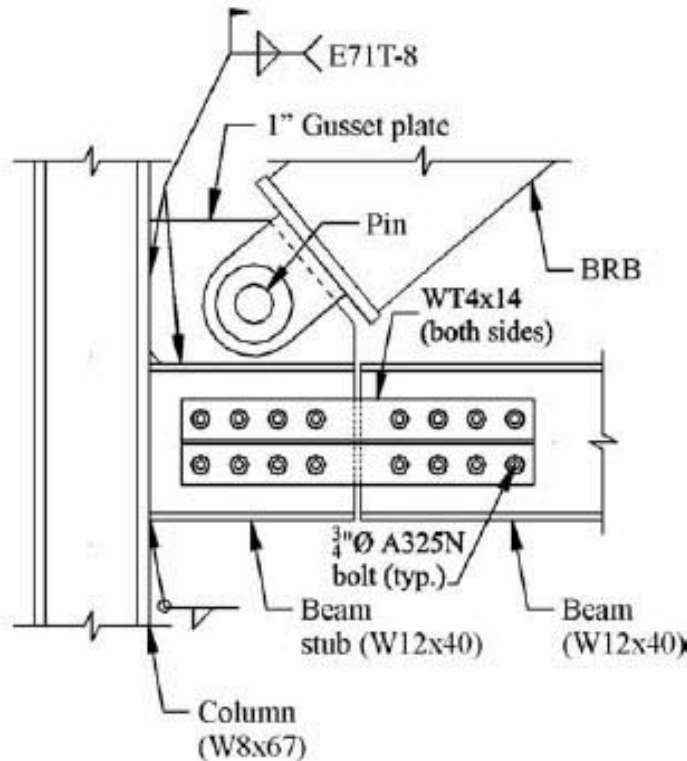


Figure 1. Bracing connection detail that accommodates local rotation demand.

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References:

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2 Uriz, Patxi and Mahin, Stephen A., [Seismic Performace Assessment of Concentrically Braced](#)  
3 [Steel Frames](#) 13th World Conference on Earthquake Engineering; Vancouver, B.C., Canada;  
4 August 1-6, 2004; Paper No. 1639.

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

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10 **REASON FOR PROPOSAL:**

11 See Commentary above.

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15 **TS 6 VOTE:**

16	Yes	-	8
17	Yes w/reservations	-	0
18	No	-	0
19	Not voting	-	0