Loos Comment 1 on AC413
By
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Comment - ADD the following referenced Standard to Section 1.3 Codes and Referenced Standards:

1.3.11 NFPA 13-02 Installation of Sprinkler Systems, National Fire Protection Association.

Substantiation – NFPA 13-02 is a Standard that is referenced by the 2006 IBC, ASCE 7-05 and it is referred to in Section 6.6 of the proposed AC413. ASCE 7-05 Section 13.6.8.2 indicates that fire sprinkler systems designed and constructed in accordance with NFPA-13-02 are deemed to meet the seismic requirements of ASCE 7-05 in Seismic Design Category C structures. ASCE 7-05 Section 13.6.8.3 indicates that, in Seismic Design Category D, E & F structures, systems designed and constructed in accordance with NFPA-13-02 are also deemed to meet the seismic requirements of ASCE 7-05, as long as they also meet the additional requirements of Section 13.6.8.3. NFPA 13-02 paragraph 9.3.5.2.2 and associated A.9.3.5.2.2 specifically addresses the use of tension only braces, which are SCFA's, used to resist seismic loads on fire sprinkler systems.

Loos Comment 2 on AC413
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Section 4.0 Structural Design

Comment - ADD the following text to Section 4.1 of AC413:

For Allowable Stress Design (ASD), the allowable working load for the SCFAs shall be based on the nominal cable strength, defined in Section 4.9 of this criteria, divided by a 1.5 Safety Factor, as defined in NFPA 13-02.

Substantiation – ASCE 7-05 Section 13.1.7 entitled Referenced Documents Using Allowable Stress Design, states that, when the referenced document provides a basis for earthquake resistant design of a particular system and defines acceptance criteria based on allowable strengths rather than strengths, that document may be used and further that the earthquake loads determined in accordance with 13.3.1 shall be multiplied by 0.7.

NFPA 13-02 is a Standard that bases its earthquake resistant design on Allowable Stress Design. It is referenced by the 2006 IBC, referenced as a complying Standard by ASCE 7-05 and it is referred to in Section 6.6 of the proposed AC413.

ASCE 7-05 Section 13.6.8.2 states that fire sprinkler systems designed and constructed in accordance with NFPA-13-02 are deemed to meet the seismic requirements of ASCE 7-05 in Seismic Design Category C structures. ASCE 7-05 Section 13.6.8.3 states that, in Seismic Design Category D, E & F structures, systems designed and constructed in accordance with NFPA-13-02 are also deemed to meet the seismic requirements of ASCE 7-05, as long as they also meet the additional requirements of Section 13.6.8.3.

NFPA 13-02 paragraph 9.3.5.2.2 and associated A.9.3.5.2.2 specifically addresses the use of tension only braces, which are SCFA's, used to resist seismic loads on fire sprinkler systems. NFPA 13 is an Allowable Stress Design Standard. The 1996 through 2010 editions of NFPA 13 require that the allowable working load for sway braces be based on a 1.5 Safety Factor taken against the ultimate break strength of the brace components (9.3.5.8.10 in NFPA 13-02), which is the cable assembly in a tension only sway brace. Further, the listing criteria in NFPA-13 (A.9.3.5.2.2(5) in NFPA 13-02) requires that the allowable working load be based on the breaking strength of the cable divided by a 1.5 Safety Factor. It is important that AC413 maintain consistency with NFPA 13-02, which is a code complying Standard for the Seismic Requirements of ASCE 7-05.

NOTE: NFPA13, TIA 02-1 referenced in ASCE 7-05 also contains ASD design criteria. In addition, NFPA 13-07 contains the same ASD design criteria as described above as well as F_{pw} sway brace design loading tables wherein F_p values from ASCE 7-05 are multiplied by 0.7 to reflect F_{pw}, ASD working load design criteria.

Comments for ICC-ES June 2009 Hearings

Document: ICC-ES AC413-0609-R1—Steel Cable and Fitting Assemblies (SCFAs) for Seismic Sway Bracing of Nonstructural Components

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Summary of Issue: A new criteria is proposed for steel cable and fitting assemblies (SCFAs) for seismic sway bracing of nonstructural components. This acceptance criteria applies to SCFAs that are the main component of tension-only cable seismic sway bracing assemblies (CSSBAs) used to resist only seismic forces and control seismic force–induced sway (displacements) of nonstructural components only.

Code Provisions:

IBC 2006
ASCE 7
ASCE 19

Discussion:

This Acceptance Criteria (AC) is very through; especially through for a sway brace. What product or products is this AC associated with? It is unclear who authored this Acceptance Criteria. It is hard to understand why any manufacturer would put together this many requirements for such a minor structural element that must compete with other bracing systems.

It appears that the design of these systems is already addressed in the code through the use of ASCE 19-96. If this is not the case what are the code provisions that are being violated and thus requires the acceptance of the building official.

The first paragraph of the cover letter states that the AC is for tension only seismic sway bracing. The second paragraph states that the staff requests input as to whether the gravity load resistance in the criteria should be in the criteria? Since most sway braces are diagonally orientated, one of the components of that load would be in the vertical direction, so capacity in the vertical direction should be included.

Recommendations:

Clarify how the subject of the evaluation report would create a conflict with the building code and then explain how the evaluation report establishes equivalent code compliance.

What would be more useful to engineers would be a guideline document published by NCSEA, ASCE or SEAOC.