



April 3, 2008

TO: PARTIES INTERESTED IN SEISMIC ISSUES IN ICC-ES EVALUATION REPORTS

SUBJECT: Status of Seismic Issues Relating to Lateral-force-resisting Products Covered in ICC-ES Evaluation Reports (ESRs)

Dear Madam or Sir:

The enclosed memorandum is being posted on the ICC-ES web site to allow for public comment.

You are cordially invited to submit written comments, within 30 days of the date of this letter. An explanation of the alternate criteria process can be found on our web site at http://www.icc-es.org/Criteria_Development/alternative_criteria_process.shtml.

All comments received in the 30-day comment period will be considered in preparing a memorandum that will be considered at the May 2008 Evaluation Committee meeting. Comments received will be posted on the web site shortly after the close of the comment period.

Your cooperation is requested in forwarding to the Los Angeles business/regional office all material directed to ICC-ES staff or the Evaluation Committee. Parties interested in the deliberations of the committee should refrain from communicating, whether in writing or verbally, with committee members. The committee reserves the right to refuse communications that do not comply with this request.

Newly approved acceptance criteria may involve test methods or test protocols that are not currently included in the scope of testing services offered by accredited testing laboratories. As noted in the ICC-ES Rules of Procedure for Evaluation Reports, the scope of the laboratory's accreditation must include the type of testing that is to be reported to ICC-ES. We encourage accredited laboratories to expand their scopes of accreditation to include testing under newly approved acceptance criteria. Please note that testing laboratories must be accredited by the International Accreditation Service (IAS) or by another accreditation body that is a signatory to the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement. For further information, please contact IAS at (562) 699-0541, extension 3309, or send an e-mail to pmccullen@iasonline.org.

If you have any questions, please contact the undersigned at (800) 423-6587, extension 3733, or Brian Gerber, S.E. Principal Structural Engineer, at extension 3275. You may also reach us by e-mail at es@icc-es.org.

Yours very truly,

A handwritten signature in black ink, appearing to read "Kurt Stochlia". The signature is written in a cursive style with a horizontal line underlining the name.

Kurt Stochlia
Vice-President, External Operations

KS/lr:raf

Enclosure

cc: Evaluation Committee



To: Parties Interested in Seismic Issues in ICC-ES Evaluation Reports

From: ICC-ES Staff

Date: April 1, 2008

Subject: Status of Seismic Issues Relating to Lateral-force-resisting
Products Covered in ICC-ES Evaluation Service Reports (ESRs)

MEMO

The purpose of this memo is to continue the discussion and solicit input on how to approach the assignment of seismic design coefficients and factors to proprietary lateral-force-resisting (LFR) products. Over the last several years the ICC-ES staff, with significant help from interested parties, has attempted to address issues involving proprietary LFR elements in ESRs. ICC-ES appreciates the help provided. The work has led to some success in the development of several criteria (AC130 and AC322) which contain seismic considerations for proprietary LFR elements used in light-frame wood stud and cold-formed steel stud construction, and AC215, which covers the establishment of seismic design coefficients and factors for autoclaved aerated concrete (AAC) structural systems.

The AC130 and AC322 criteria involve the assignment of a specific seismic design coefficient ($R = 6.5$) and corresponding factors to proprietary LFR elements based on an “element equivalency” approach. AC215 involves the establishment of seismic design coefficients and factors based a system approach. Both approaches require some form of cyclic testing and analysis of data.

Although the “element equivalency” approach works well for AC130 and AC322 (light-frame wood stud and cold-formed steel stud) when the LFR element complies with the parameters for a system where $R = 6.5$, it does not appear feasible to use this approach for other types of seismic-force-resisting products. The “element equivalency” approach is based on a comparison of the performance of the proprietary seismic-force-resisting element to a code element which is part of a defined ($R = 6.5$) seismic-force-resisting system. The approach requires a reasonably sized data base for a proper comparison and assumes the proprietary seismic-force-resisting element can replace a code-complying element in the defined seismic system. This concept does not carry over to a single element from a proprietary seismic-force-resisting system tested to define the seismic characteristic of the entire system. We also need to consider the situation in which the proprietary LFR element to be used with light-frame wood stud and cold-formed steel stud construction does not comply with the requirements noted in AC130 and AC322 for an $R = 6.5$. An approach similar to that described in AC215 or ATC-63 appears to be more appropriate.

Other seismic-force-resisting products that need consideration for the establishment of seismic design coefficients and factors are insulated concrete forms (ICF), mortarless CMU construction, EPS-wire-shotcrete construction, several concrete products such as proprietary prefabricated concrete wall and foundation panels (including ACC wall panels), polymer-resin-type products (wall, floor and roof shell construction) and sandwich panels. One approach may not be appropriate for all these different types of products but the seismic considerations that need to be addressed are similar. We are aware of the concept noted in Section 1629.2 of the 1997 *Uniform Building Code*[™] (UBC) regarding undefined structural systems. However, at this time we are unaware of a method to measure and apply all the items noted in an equitable manner to various seismic-force-resisting products.

There have been many changes, and ideas exchanged, with regard to basic seismic considerations between the time of issuance of evaluation reports under the UBC and the 2000 *International Building Code*[®] (IBC) and the current, 2006 IBC. A question has been raised as to why ICC-ES makes such a distinction between the requirements in issuing ICC-ES evaluation reports under the 2003 IBC and the 2006 IBC with regard to seismic considerations. In the past, most evaluation reports have been silent with regard to assigning specific seismic design coefficient and factors (seismic zones under the UBC) to proprietary seismic-force-resisting elements. We have accepted comments from report holders that sufficient data and information will be submitted to the local building department for each project verifying that the specific seismic design coefficient and factors utilized in the design of the structure, using the proprietary seismic-force-resisting elements, are appropriate and comply with the code. Based on our experience over the last few years with the initial development of AC215 and AC130, and more recently with the development of AC322 and changes to AC130, we have found that the assigning of appropriate seismic design coefficient and factors to proprietary seismic-force-resisting elements or systems is a very complicated and difficult task. When we have asked how this is to be accomplished, we have been discouraged by the answers. There did not seem to be a logical approach to the assignment of specific seismic design coefficient and factors to proprietary seismic-force-resisting elements or systems, especially when there was no appropriate cyclic test data. It is our viewpoint that a rigorous approach that involves both cyclic testing and an acceptable method of analysis is needed to determine the appropriate coefficients and factors.

We are soliciting information on the approach we should take to establishing seismic design coefficients and factors to be assigned to the various proprietary seismic-force-resisting products. Since this project will take some time, a question has been raised as to what ICC-ES will do until these issues are resolved. To help with our decision ICC-ES is soliciting input regarding a conservative approach that could be used in the interim, which would allow us to show compliance with the 2006 IBC; such as limiting the

proprietary seismic-force-resisting products to one or two stories, assuming an $R = 2$, limiting to use in SDC A and B and/or requiring cyclic testing with the cyclic test data included in an evaluation report so that an engineer has appropriate information to make a determination as to the appropriate seismic design coefficient and factors to use with the proprietary seismic-force-resisting products within a building system.

We intend to take the information received in response to this memo to the ICC-ES Evaluation Committee hearing in Chicago the last week in May 2008. Additional information regarding the meeting is available on our web site www.icc-es.org.

Please direct all correspondence to Brian Gerber, S.E. (bgerber@icc-es.org), or Kurt Stochlia, P.E. (kstochlia@icc-es.org). Mail can be sent to the address noted in this memo.