



August 1, 2008

TO: PARTIES INTERESTED IN THE GUIDELINE FOR A PROCESS TO DEVELOP SEISMIC PERFORMANCE FACTORS FOR LATERAL-FORCE-RESISTING PRODUCTS

SUBJECT: Proposed Guideline for a Process to Develop Seismic Performance Factors for Lateral-Force-Resisting Products, Subject Miscellaneous 1-0808-R1 (KS/BG)

Dear Madam or Sir:

The subject was discussed at the May 2008 ICC-ES Evaluation Committee hearing and this staff letter is a follow up to the hearing. A staff memo dated May 21, 2008, provided a consensus on the comments in the letters sent prior to the hearing and puts forth some questions and issues that were discussed at the hearing. The memo is available on the ICC-ES web site.

A consensus was reached at the hearing on several of the following items noted for discussion.

- It would not be prudent or helpful to industry, the design professional or the code official if ICC-ES ignored the issue and published evaluation reports (ESRs) that were silent on seismic performance factors that would be applicable to the product or system described in the ESR.
- ICC-ES should move forward on developing a procedure (guideline) for assigning seismic performance factors. This would include information for the formation of expert panels (task groups).
- Using the procedure noted in the "guideline", it would be possible to develop seismic performance factors based on an ATC-63 or an equivalency approach.
- An AC215 approach is possible, but needs to be updated to consider the "Maximum Considered Earthquake (MCE)".
- Using the procedure noted in the "guideline", a shake table approach might be possible but the results would be limited.

- It would be advantageous if solutions were pursued collectively by industries rather than individual companies.

In response to the consensus that an ICC-ES guideline would be appropriate and helpful, staff has prepared the enclosed proposed guideline for public review. A preliminary review has resulted in several comments that need additional input.

1. The guideline currently notes that the task group shall have 6 to 8 members. It is our opinion that a minimum of 6 members is need. To avoid becoming too cumbersome, it should be limited to a maximum of 8 members, unless it can be shown that more members would be necessary to complete the work (consultation with ICC-ES).
2. A concern has been raised that since the ATC-63 Project has not been completed, care should be exercised in using this option, until such time it was completed and the results, using the procedure, are rationalized with the current code described lateral force resisting systems. Comments are requested.
3. It has been suggested that the list noted in Sections 1.3.3 to 1.3.7 be expanded to include *ATC-24-Guidelines for Cyclic Testing of Components of Steel Structures* and *ITG 1-Moment Frames (ACI-318-08)*. Could this list also be simplified? Comments are requested.
4. It has been suggested that an ICC-ES staff member be part of the task group. This is a possibility that depends on the number of task groups.
5. It has been suggested that ICC-ES develop a list of prospective task group members. Staff feels this is a possibility. Possible task group members would submit their credentials to ICC-ES and we would maintain the list as a service to our applicants. Comments are requested.

You are cordially invited to submit written comments, within 30 days of the date of this letter. Please use the comment form on the web site attaching any letters to the form. 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 revisions to the guideline. 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 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.

Please submit all comments using the form on the web site. Attach any letters to the comment form. If you have any questions (not comments), please contact the undersigned at (800) 423-6587, extension 3733, or Brian Gerber, S.E., Principal Structural Engineer, at extension 3260. You may also reach us by e-mail at es@icc-es.org.

Yours very truly,



Kurt Stochlia, P.E.,
Vice-President, External Operations

KS/LS:raf

Enclosure

cc: Evaluation Committee

**GUIDELINE FOR A PROCESS TO DEVELOP SEISMIC PERFORMANCE
FACTORS FOR LATERAL FORCE RESISTING (LFR) PRODUCTS DESCRIBED
IN AN ICC-ES EVALUATION REPORT (ESR)**

1 **1.0 INTRODUCTION**

2 **1.1 Purpose:** To provide a process to develop seismic performance
3 factors for lateral-force-resisting (LFR) products that will be covered in an ICC-ES
4 Evaluation Report (ESR).

5 **1.2 Scope:** This guideline will apply to lateral-force-resisting products not
6 listed or defined in ASCE 7-05, Table 12-2.1. Analytical and test data shall be
7 submitted that will establish the dynamic characteristics and demonstrate the later-
8 force-resistance and energy dissipation capacity to be “equivalent” to one of the
9 structural systems listed in ASCE 7-05, Table 12-2.1, in regards to the factors listed
10 in Section 1.2.1 in this guideline; or an approach as outlined in ATC-63 Project-90%
11 Draft report, FEMA P695, *Qualification of Building Seismic Performance Factors*,
12 shall be used as a basis to establish the dynamic characteristics.

13 **1.2.1** Seismic factors to be developed shall be the Response
14 Modification Factor (R), System Over-strength Factor (Ω_0) and the Deflection
15 Amplification Factor (C_d).

16 **1.2.2** A task group/committee of experts (the task group) shall be
17 established to develop or review the initial proposal, initial test results and final
18 results as noted in Sections 3.1 and 3.2 in this guideline.

19 **1.2.3** A design procedure for the LFR product shall exist or be
20 developed as part of the task group plan.

21 **1.2.4** All products shall be justified by cyclic-racking load tests in
22 accordance with one of the methods noted in Sections 1.3 .3 to 1.3.7 of this
23 guideline. The task group may establish the acceptance criteria based on more than
24 one test method.

25 **1.2.5** Justification as to the ability of the LFR products to resist gravity
26 loads shall be provided in the form of calculations and/or load testing. However, the

27 ability of the LFR product to resist transverse loads (out of plane) is outside the
28 scope of this guideline. Individual evaluation reports for products intended to support
29 the transverse loads will require justification with substantiating data in the form of
30 calculations and/or load testing.

31 **1.3 Code and Reference Standards:**

32 **1.3.1** 2006 *International Building Code*[®] (IBC), International Code
33 Council.

34 **1.3.2** ASCE 7-05, *Minimum Design Loads for Buildings and Other*
35 *Structures*, American Society of Civil Engineers.

36 **1.3.3** *Standard Test Method of Cyclic (Reversed) Test for Shear*
37 *Resistance of Framed Walls for Buildings*, by the Structural Engineers Association of
38 Southern California (SEAOSC), dated August 1, 1996 (revised January 20, 1997).

39 **1.3.4** ASTM E 2126-07, *Standard Test Methods for Cyclic (Reversed)*
40 *Load Test for Shear Resistance of Walls and Buildings*, ASTM International.

41 **1.3.5** AC130, *Acceptance Criteria for Prefabricated Wood Shear*
42 *Panels*, dated November 1, 2007.

43 **1.3.6** AC215, *Acceptance Criteria for Seismic Design Factors and*
44 *Coefficients for Seismic-Forces-Resisting Systems of Autoclaved Aerated Concrete*
45 *(ACC)*, dated November 1, 2003.

46 **1.3.7** AC322, *Acceptance Criteria for Prefabricated, Cold Formed,*
47 *Steel Lateral-Force-Resisting Vertical Assemblies*, dated March 1, 2008 (revised
48 April 2008).

49 **1.4 Definitions:**

50 **1.4.1 The Task Group:** Shall consist of experts in the fields of
51 seismic testing, analysis and design, with knowledge of the LFR product under
52 consideration. Members shall be design engineers, representatives from industry
53 associations associated with the LFR product under consideration, LFR product
54 manufacturers and academics.

55 **1.4.2 LFR Product:** Can be either a LFR element or an entire LFR
56 system.

57 **2.0 BASIC INFORMATION**

58 Testing laboratory, test reports and product sampling shall be in accordance with the
59 ICC-ES Rules of Procedure for Evaluation Reports.

60 **3.0 PROCESS REQUIREMENTS.**

61 **3.1 Procedure For Establishing The Task Group:**

62 **3.1.1** The task group shall consist of 6 to 8 members. The task group
63 shall elect its own chairman. Additional members may be added after consultation
64 with ICC-ES.

65 **3.1.1.1** Establishment of the task group shall be done in
66 consultation with ICC-ES.

67 **3.1.1.2** The task group members shall be independent
68 individuals not associated with the LFR product under consideration, except for the
69 ICC-ES report applicant and/or their consultant.

70 **3.1.1.3** The task group shall contain a balance of members noted
71 in Section 1.4.1 of this guideline.

72 **3.1.2** It shall be the responsibility of the evaluation report applicant or
73 an industry with similar interests to establish and maintain the task group.

74 **3.1.3** Task group members shall receive no compensation from ICC-
75 ES. If compensation is to be considered, it should be established by the evaluation
76 report applicant or an industry with similar interests.

77 **3.1.4** A separate task group shall be established for each application
78 unless prior approval is received from ICC-ES.

79 **3.1.5** The task group shall meet by means of face-to-face meeting,
80 teleconferencing, and/or other communication methods. The location and frequency
81 of the meeting shall be selected to not create an unreasonable burden to discourage
82 the task group members from attendance. The expenses for the meeting or
83 teleconferencing shall be the responsibility of the evaluation report applicant or an
84 industry with similar interests.

85 **3.1.6** The task group is considered consensus by the agreement of at
86 least 2/3 of the task group members before the recommendations for seismic

87 performance factors for LFR products/systems are submitted to ICC-ES. Any
88 dissenting opinions should be also submitted to the ICC-ES Evaluation Committee
89 for consideration. If consensus cannot be reached by the task group, the final
90 resolution of the task group should be documented and provided to the ICC-ES
91 Evaluation Committee for consideration.

3.2 Task Group Responsibilities:

92 **3.2.1** The initial proposal shall be submitted to ICC-ES for review after
93 the task group has reviewed the proposal and prior to commencing testing under this
94 guideline. The initial proposal from the task group shall include but not limited to:

95 **3.2.1.1** The procedure to be used.

96 **3.2.1.2** Identifying the test method.

97 **3.2.1.3** Identifying the target parameters and values.

98 **3.2.1.4** Plans for a task group review of some initial results to
99 ensure the proposal is on track.

100 **3.2.2** The final results shall be submitted to ICC-ES and shall include
101 a recommendation as to the seismic factors noted in Section 1.2.1 of this guideline,
102 to be assigned to the LFR product. The final proposal from the task group shall
103 include but is not limited to:

104 **3.2.2.1** Review of data.

105 **3.2.2.2** Verification of the requested seismic performance
106 factors.

107 **3.2.2.3** Issuance of a final report.

108 **3.2.3** The task group as part of their review and final report shall also
109 be required to submit information on any design limitations or considerations such as
110 story or building heights or Seismic Design Categories (SDC).

3.3 Basic Procedure For Equivalency Method:

111 **3.3.1** Define the LFR's structural system relative to systems listed in
112 ASCE 7-05 Table 12-2.1.

113 **3.3.2** Data from the LFR product's characteristics shall be obtained
114 based on cyclic load testing as outlined in this guideline. The data shall be used to
115
116

117 develop hysteretic curves, parameters and target values. Appendix A of AC322 can
118 be used as a guide to the development of acceptable parameters and target values.
119 The results shall be compared to and be comparable with the performance of similar
120 systems defined and listed in ASCE 7-05, Table 12-2.1.

121 **3.4 Basic Procedure for ATC-63 Project Method:**

122 The procedure shall follow the general process noted in Figure 2-2 in ATC-63
123 Project-90% Draft report, FEMA P695 *Qualification of Building Seismic Performance*
124 *Factors*.