



Mr. Peter Bahlo, P.E.
ICC Evaluation Service
5360 Workman Mill Road
Whittier, CA 90601

Date: January 23, 2008

Re: AC86-0208-R1

Dear Mr. Bahlo,

Dietrich Industries comments on the proposed changes to AC86 are outlined below.

- Section 3.1.3: Dietrich supports the position to permit a maximum variance of 25% over ASTM C1396 minimums for flexural strength values of gypsum panel products used in the wall assembly tests. Gypsum board at 15% can be found, but it is not the norm.
- Section 3.2.2: Dietrich concurs with the proposed change to allow the use of L/180 in place of L/120.
- Section 3.2.2.3: Dietrich supports the proposed change to remove the requirement for the assembly to resist 1 ½ times maximum deflection.
- Section 3.3.1.3: Dietrich agrees with the proposal to reduce the target reliability index β_0 , from 2.5 to 1.5. The resultant safety factor of 1.72 is higher than the historical 1.5 that has been used with no know safety issues for decades
- Section 4.1.2: Dietrich disagrees with this proposal. If this proposal is allowed it will mean the majority of all limiting heights developed will be done via extrapolation. This is a bad scientific policy. Most companies propose a test plan outlining a matrix of products and test a variety of points of the matrix that result in solid data based on actual tests and or interpolation. This is the policy that Dietrich supports and proposes that ICC-ES adopts.

The most important issue to Dietrich has not been addressed. This Acceptance Criteria has been in a state of flux for years. It was just approved 7 months ago. It is our request that ICC-ES puts a stake in the ground and moves forward with criteria that remains stable for a reasonable period of time. Further, the changes in this report are very significant. We feel for all constituents to be treated fairly there needs to be a set time that existing reports, based on old data, are terminated. This date needs to be set a reasonable time forward as there is a lot of testing required updating to the new criteria. However, if a policy such as this is not put in place there will be conflicting reports, with drastically different data, for the same products. These differences would penalize anyone that chooses to test to the new criteria.

Sincerely,

Gregory S. Ralph
Director-Product Development

R.M. SCHUSTER PhD, P. Eng.
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January 20, 2008

Dear Mr. Bahlo;

Re: Response to your letter dated December 28, 2007

First of all, I am pleased to see that my submission regarding certain suggested revisions to AC86-07 has been favourably received by yourself and staff. I hereby offer response comments to your December 28/07 letter and additional detailed data in an effort to substantiate item 3 of my December 4/07 letter to you.

Item 1 of your December 28/07 letter

In order to create a level playing field regarding gypsum board used in testing interior partition wall assemblies, I feel that there are two distinctly different issues that need to be addressed separately, and they are *1) what is the variability of like gypsum board products between the manufacturers of such products in the US/North America?* To address this, one needs to involve the National Gypsum Board Association/Manufacturers to obtain gypsum board flexural strength test data in an effort to establish the range of variability of commonly used gypsum board products in commercial partition wall installations. Issue *2) what is the variability in the flexural strength of the actual partition wall assembly tests?* That is, once a particular gypsum board has been selected for testing, the variability of such tests will be obtained by the coefficient of variation (COV), which in turn will be used in the calibration of the factor of safety.

Staff seeks input and has expressed concern with allowing any significant flexural over-strength (beyond the currently permitted 15%). First of all, I feel that one needs to address the appropriateness of this 15% value. If it was not based on factual data reflecting typical products currently used in the industry, then I strongly feel that the gypsum industry needs to become involved in establishing an appropriate value. This I have already stated in item 1 of my December 4/07.

Item 4 of your December 28/07 letter

I wish to hereby submit additional individual test results in support of item 3 of the suggested revision in my December 4/07. You state in your December 28/07 letter that,

“Staff believes the use of wallboard materials acting in composite action with metal studs to enhance the transverse strength and stiffness of nonload-bearing wall assemblies will result in higher variations in test results from designs using the steel action alone”

I have summarized the 30 individual tests that were used in my December 4/07 letter in an effort to show the true variations with respect to the average values in each test group (see Tables in my January 19/07 letter). As can be observed, except for the 16” stud spacing in Table 2, the % difference values are well within the $\pm 15\%$ as per Section F1.1 of the North American Specification for the Design of Cold-Formed Steel Structural Members. The test load (8.10 psf) of Test 1 of the 16” stud spacing in Table 2 is

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considerably lower than the identical values (12.5 psf) of Tests 2 and 3. Test 1 can certainly be attributed to an outrigger test, which can occasionally happen. As it turns out here, the average value is consequently lowered. Additional tests can be carried out, but this drives the already high cost of testing even higher.

One needs to understand that any variability in the wall assembly test results will be taken into account in the coefficient of variation (COV), which is an important parameter in the calibration procedure of the factor of safety. As can be observed from the attached Tables, again except for the 16" stud spacing in Table 2, the COV values are for the most part below 6.5%. If one were to take the average COV of the 0.0155" test results (Tables 1 and 2), the COV would be 6.60% and 6.12% for the 0.0245" tests (Tables 3 and 4). Even if the COV were below 6.5%, one must use 6.5% as specified in Chapter F of the NAS.

Based on these individual test results, one can conclude that the variability of the actual panel tests is certainly not an issue. In conclusion, I still feel that changing the target reliability index β_o to 1.5 would be the right approach for non-load bearing interior partition walls, resulting in the lowest possible factor of safety of 1.72.

Item 5 of your December 28/07 letter

Staff supports the request of testing only the 24" stud spacing, provided that a limited set of test data demonstrate no significant difference in wall stiffness regardless of wall stud spacing. Their decision is based only on one isolated case of data that was submitted in my December 4/07 letter, where the stiffness per stud of the 16ft (15.67') – 35/8" x 0.0245" panel test was approximately 20% less with the 24" stud spacing in comparison to the 12" stud spacing. I still feel that only the 24" stud spacing needs to be tested and that any additional stud spacing tests (12" or 16") should be optional and at the discretion of the company paying for the testing.

I trust that this will be received and dealt with in the spirit in which it is intended.

c.c. Kurt Stochlia, P.E.

Reinhold Schuster

Professor Emeritus
University of Waterloo

**ADDITIONAL DATA IN RESPONSE TO ITEM 4. OF THE DECEMBER 28/07 LETTER
BY PETER BAHLO**

TABLE 1 - INDIVIDUAL TEST RESULTS

8ft (7.67') - 35/8" x 0.0155"			
Stud Spacing (in.)	Test Load (psf)		
	% DIFFERENCE		
12			
	Test 1	57.2	4.35
	Test 2	57.2	4.35
	Test 3	65.0	8.70
	Average	<u>59.8</u>	
	COV (%)	<u>7.53</u>	
16			
	Test 1	46.3	0.361
	Test 2	46.3	0.361
	Test 3	45.8	0.723
	Average	<u>46.1</u>	
	COV (%)	<u>0.626</u>	
24			
	Test 1	31.2	0
	Test 2	31.2	0
	Test 3	31.2	0
	Average	<u>31.2</u>	
	COV (%)	<u>0</u>	

TABLE 2 - INDIVIDUAL TEST RESULTS

16ft (15.67') - 35/8" x 0.0155"			
Stud Spacing (in.)	Test Load (psf)		
	% DIFFERENCE		
12			
	Test 1	18.2	0.924
	Test 2	18.2	0.924
	Test 3	17.7	1.85
	Average	<u>18.0</u>	
	COV (%)	<u>1.60</u>	
16			
	Test 1	8.10	26.6
	Test 2	12.5	13.3
	Test 3	12.5	13.3
	Average	<u>11.0</u>	
	COV (%)	<u>23.0</u>	
24			
	Test 1	7.30	0
	Test 2	7.80	6.85
	Test 3	6.80	6.85
	Average	<u>7.30</u>	
	COV (%)	<u>6.85</u>	

TABLE 3 - INDIVIDUAL TEST RESULTS

8ft (7.67') - 35/8" x 0.0245"			
Stud Spacing (in.)	Test Load (psf)		
	% DIFFERENCE		
12			
	Test 1	85.8	1.62
	Test 2	80.6	4.54
	Test 3	86.9	2.92
	Average	<u>84.4</u>	
	COV (%)	<u>3.99</u>	
24			
	Test 1	41.6	5.17
	Test 2	44.2	0.760
	Test 3	45.8	4.41
	Average	<u>43.9</u>	
	COV (%)	<u>4.83</u>	

TABLE 4 - INDIVIDUAL TEST RESULTS

16ft (15.67') - 35/8" x 0.0245"			
Stud Spacing (in.)	Test Load (psf)		
	% DIFFERENCE		
12			
	Test 1	21.9	5.87
	Test 2	26.0	11.7
	Test 3	21.9	5.87
	Average	<u>23.3</u>	
	COV (%)	<u>10.2</u>	
24			
	Test 1	10.9	6.30
	Test 2	12.0	3.15
	Test 3	12.0	3.15
	Average	<u>11.6</u>	
	COV (%)	<u>5.46</u>	

% DIFFERENCE = Percent difference with respect to average value [Section F1.1 of the NAS, ± 15%]

COV (%) = Coefficient of variation in percent

NOTE: 5/8" Type X USG board was used with all 30 tests.



January 23, 2008

AC86-0208-R1

Mr. Peter Bahlo, P.E.
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5360 Workman Mill Road
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Dear Mr. Bahlo,

The Steel Stud Manufacturers Association (SSMA) has reviewed the proposed changes to Acceptance Criteria AC86.

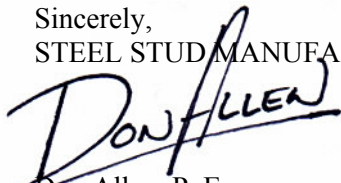
- SSMA supports the revision to section 3.1.3 to permit a variance of 25% rather than the 15% currently allowed for flexural strength values of gypsum panel products used in the wall assembly tests.
- SSMA supports the revision of section 3.2.2 to include the statement, "in the case that L/120 deflection level cannot be obtained, it shall be permitted to use L/180 in place of L/120."
- SSMA supports the deletion of section 3.2.2.3, which in effect deletes the requirement that the test assemblies used to derive the wall assembly stiffness be capable of resisting 50 percent more load causing maximum deflection.
- SSMA supports the revision of the target reliability index β_0 , from 2.5 to 1.5, as shown in section 3.3.1.3.

On the first point, with respect to the permitting of a 25 percent variance for flexural strength of gypsum panel products: In 2007, the SSMA extended a formal request to the Gypsum Association to see if they could provide data on their products that would show that the variation in strength of their board products is such that would validate a change to a higher number. They agreed that the number could (and should) be higher for AC86, but as of the writing of this letter they do not yet have data prepared that could be released to SSMA.

- Several of our member companies that are attempting to perform tests in accordance with AC86 are having difficulty finding products that are in the 15% range. I do know of one company that has found some product within the 15% range, but this was after considerable effort and expense.
- Depending upon the test and the failure mode, the flexural strength of the gypsum panel products will have little effect on the test results. In some cases (test types), the flexural strength will have no effect.
- This is not a life safety issue.

Thank you for your consideration. SSMA will have a representative at the February 5 hearing on this issue; we look forward to a mutually agreeable resolution.

Sincerely,
STEEL STUD MANUFACTURERS ASSOCIATION


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