Architectural Testing

July 25, 2005

Mr. Jeff Davis
Custom Decorative Moulding
12136 Sussex Highway
Greeenwood, Delaware 19950

RE: ATI Job No. 58498.01 - *Pro-Rail* Guardrail System

Dear Mr. Davis:

On July 05, 2005, pursuant to your request, Architectural Testing, Inc. (ATI) conducted structural performance tests on Custom Decorative Moulding's 8 ft. by 42" *Pro-Rail* guardrail system in accordance with the design load requirements applicable to ICC-ES AC174 (July 1, 2005), *Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems* (*Guards and Handrails*) intended for use in one- and two- family dwelling applications. Testing for ICC-ES AC174 is limited to satisfying the minimum requirements of Section 5.0, *Guardrail System (Guard and Handrail) Performance Requirements*. Testing is limited to test loads equal to 2.5 times the design load. Justification for the adequacy of the 2.5 load factor is not within the scope of this report. There was no product sampling performed, as required by Section 2.4 of AC174, on any of the guardrail components. Following is a cursory description of the tested assembly and summary of the test results.

Test Specimens: The railings consisted of a wood reinforced PVC top and bottom rail with an overall length of 96" and an overall height of 42". The top and bottom rail members had a wood reinforcement which ran the entire length of the rail. To adhere the wood reinforcement to the PVC rail the manufacturer used *Titebond* heavy duty contractor adhesive. The railing utilized spaced 1-1/4" square pickets, which were secured to the top and bottom wood reinforcement with #10 by 2" stainless steel screws providing 3-1/2" clearance between balusters. Rails were attached to conventional 4x4 pressure treated Southern Yellow Pine (SYP) wood posts with metal angle brackets. The top rail bracket utilized two #10 by 1-1/4" stainless steel screws for attachment to the rail and used two #10 by 2-1/2" stainless steel screws for attachment to the support post. The bottom rail bracket attachment method was identical with the exception that it used one 5/16" by 2" stainless steel lag bolt for attachment to the support post. See photographs attached for the test setup.

Test Results: The following tests were performed on the rail assemblies. Except as noted, all loads and displacement measurements are normal to the rail (horizontal). The test results apply only to the railing assembly between supports and anchorage to the support. Support posts are not a tested component; therefore, testing of the support posts is not within the scope of this evaluation.

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Test Results: (Continued)

8 ft. by 42 in. *Pro-Rail* Guardrail System
Metal Angle Brackets Attached to Conventional 4x4 Wood Post
Limited to Use in One- and Two-Family Dwellings / AC174

Test No. 1 - 07/05/05 **Design Load: 50 lbs / 1 Square ft. of In-Fill at Center (Two Balusters)**			
Load Level	**Test Load (lbs)**	**E.T. (min:sec)**	Sustained load equal to or greater than 125 lbs for minimum of one minute
125 lbs (2.5x D.L.)	125 - 138	00:22 - 01:33	

Test No. 2 - 07/05/05 **Design Load: 50 lbs / 1 Square ft. of In-Fill at Bottom (Two Balusters)**			
Load Level	**Test Load (lbs)**	**E.T. (min:sec)**	Sustained load equal to or greater than 125 lbs for minimum of one minute
125 lbs (2.5x D.L.)	129 - 140	00:15 - 01:26	

Test No. 3 - 07/05/05 **Design Load: 200 lbs Concentrated Load at Midspan of Top Rail**						
Load Level	**Test Load (lbs)**	**E.T. (min:sec)**	**Displacement (inches)**			
			End	**Mid**	**End**	**Net[1]**
200 lbs (D.L.)	200	00:11	0.03	0.95	0.03	0.92
500 lbs (2.5x D.L.)	505 - 527	00:19 - 02:07	Sustained load equal to or greater than 500 lbs for minimum of one minute			
Deflection Evaluation: Maximum rail deflection at 200 lbs = 0.92" on an 8 ft rail (96"). Limits per AC174: $\left(\frac{h}{24}+\frac{l}{96}\right)=\left(\frac{42}{24}+\frac{96}{96}\right)=2.75"> 0.92" \therefore ok.$ and, $\frac{h}{12}=\frac{42}{12}=3.5"> 0.92" \therefore ok$						

[1] *Each end displacement is measured at the center of the 4x4 support. Net displacement is the rail deflection relative to the supports.*

Test No. 4 - 07/05/05 **Design Load: 200 lbs Concentrated Load on Top Rail Adjacent to a Post[1]**			
Load Level	**Test Load (lbs)**	**E.T. (min:sec)**	**Displacement (inches)**
2.5x Design Load	504 -550	00:15 - 01:34	Sustained load equal to or greater than 500 lbs for minimum of one minute

[1] *Support posts are not tested and are not within the scope of this evaluation.*

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Limitations of Test: The railing assembly met the structural performance requirements of Section 5.0 of AC174 applicable to detached one- and two-family dwellings only, as installed between adequate supports for rail lengths up to and including 96". The railing supports are not included within the scope of this testing, and these conclusions would apply only for a railing that is provided with supports that also meet the performance requirements of AC174 and are of equal or better substrate material for the fasteners used to anchor the rail brackets (SYP wood).

This is a summary of the testing for your information only. Should you desire a complete and formal test report, ATI shall require detailed assembly drawings that fully describe the tested assemblies.

For ARCHITECTURAL TESTING, INC:

Travis A. Hoover
Project Engineer - Code Compliance

TAH:tah/nlb
58498.01-119-19

Attachments (pages)
Photographs (3)

Photo No. 1
In-Fill Load at Center

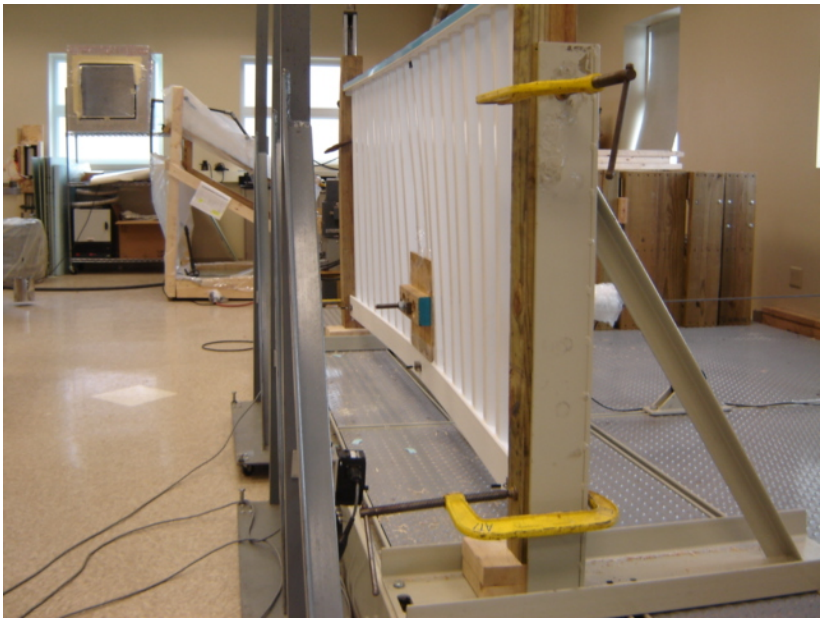

Photo No. 2
In-Fill Load at Bottom

Photo No. 3
Concentrated Load at Midspan of Top Rail

Photo No. 4
Concentrated Load on Top Rail Adjacent to a Post

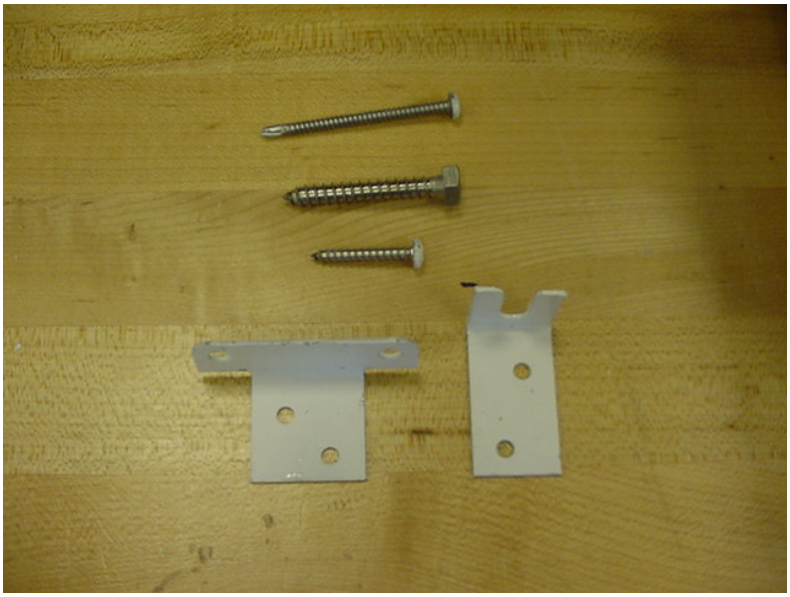

Photo No. 5
Top and Bottom Brackets with Mounting Hardware