



**PFS
Test
Report**



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Quality Assurance • Design Calculations • Sampling • Witnessing

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STRUCTURAL INSULATED PANELS

Structural Performance and Adhesive Qualification

STRUCTURAL and CONSTRUCTION ADHESIVES

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ROOF COVERINGS and EXTERIOR SIDINGS

All types

FASTENERS and CONNECTIONS

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**PFS TEST REPORT #12-031
RDI METAL WORKS EXCALIBUR
PRE ASSEMBLED METAL RAILING TEST
ACCORDING TO ASTM E985 TO CONFIRM WITH
IBC 2012 AND IRC 2012 LOAD
FOR
RAILING DYNAMICS, INC.
EGG HARBOR, NEW JERSEY**

GENERAL

PFS Corporation, Cottage Grove, Wisconsin was contracted by Railing Dynamics, Inc., New Jersey, to evaluate the performance of RDI Metal Works Excalibur railing system. The railing system components were received in good order at PFS on May 22, 2012. The test was conducted according to ASTM E985-00, "Standard Specification for Permanent Metal Railing Systems and Rails for Buildings" on May 24-29, 2012.

TEST SPECIMENS

The client submitted four sets of Metal Works Excalibur pre-assembled metal railing system kits (Photo 1). The rail system consisted of pre-fabricated infill panel and posts. The infill panel consisted of 5/8-in. square balusters spaced at 4-1/2-in. on center and welded to top and bottom rails, 1-in. square. The post consisted of 2-in. square. The infill panel was mounted on to the posts, the screw locations were drilled with 5/32-in. drill bit, then attached with self-tapping screws provided with the kit. The assemble railing system was 8-ft length with 42-in. top rail height

CONDITIONING

The boards were stored and tested in the ambient laboratory atmosphere of approximately 70 - 75°F and 40 - 50% relative humidity.

TEST PROCEDURE AND RESULTS

The railing system was tested according to ASTM E985-00, Sec. 7.1.1 to confirm with the IBC 2012 and IRC 2012 load requirements of 50 plf uniformly distributed load and 200 lbf concentrated load. Three replicate assemblies were fabricated and tested. The posts of the railing assembly were rigidly bolted on to the test frame with four 3/8-in dia bolts (Photo 2). The assembly was then sequentially subjected to the following seven loading configurations -

1. 200 lbf concentrated load applied at the top midspan vertically,
2. 200 lbf concentrated load applied at the top rail near post connection vertically (Photo 3),
3. 50 plf uniform load (400 lbf at quarter points) vertically (Photo 4),
4. 200 lbf concentrated load applied at the top midspan horizontally (Photo 5),
5. 200 lbf concentrated load applied at the top rail near post connection horizontally (Photo 6),
6. 50 lbf load applied at the midspan of the infill area (Photo 7),
7. 50 plf uniform load (400 lbf at quarter points) horizontally (Photo 8).

The load was applied with a hydraulic cylinder and test fixture apparatus. The test force was measured with an electronic load cell positioned between the test specimen and hydraulic cylinder. The loading sequence consisted of applying the load gradually to preload 50% of the target load and hold for 2 min, then release to 25% (50% of preload) and hold for 2 minutes, then gradually load to the target load and hold for 2 minutes. The 50 plf uniform load test was applied with equivalent concentrated loads located at 1/4 of the test span from the ends.

The railing assembly did not show any sign of failure at the prescribed loads.

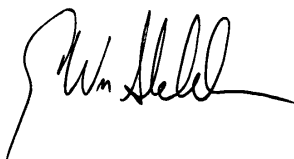
<i>Assembly Load Configurations</i>	<i>Net Max Deflection Measured from Preload Released Stage</i>		
	<i>Rail #1</i>	<i>Rail #2</i>	<i>Rail #3</i>
200 lb Vertical at top rail midspan, <i>Deflection limit 1"</i>	0.30	0.31	0.30
200 lbf Vertical at top rail near post connection	0.00	0.01	0.00
50 plf Vertical at Top Rail, <i>Deflection limit 1"</i>	0.41	0.39	0.37
200 lb Horizontal at top rail midspan, <i>Deflection limit 2.75"</i>	1.71	1.78	1.88
200 lbf Horizontal at Top Rail near post connection, <i>Deflection limit 3.5"</i>	0.29	0.30	0.35
50 lbf Horizontal Infill Midspan	0.33	0.31	0.35
50 plf Horizontal at Top Rail, <i>Deflection limit 2.75"</i>	2.43	2.27	2.44

Rail Span = 8-ft, Rail Height = 42-in.

TEST REPORT DUPLICATION

This report shall not be reproduced, except in full, without the written approval of PFS Corporation, Cottage Grove, Wisconsin.

Testing Performed by:



Jim Sheldon
 Lead Lab Technician

Report Prepared and
 Tests Witnessed by:



Deepak Shrestha, PhD, PE
 General Manager – PFS Lab



PHOTO 1: Metal Works Railing System



PHOTO 2: Post Mounted on to Test Frame

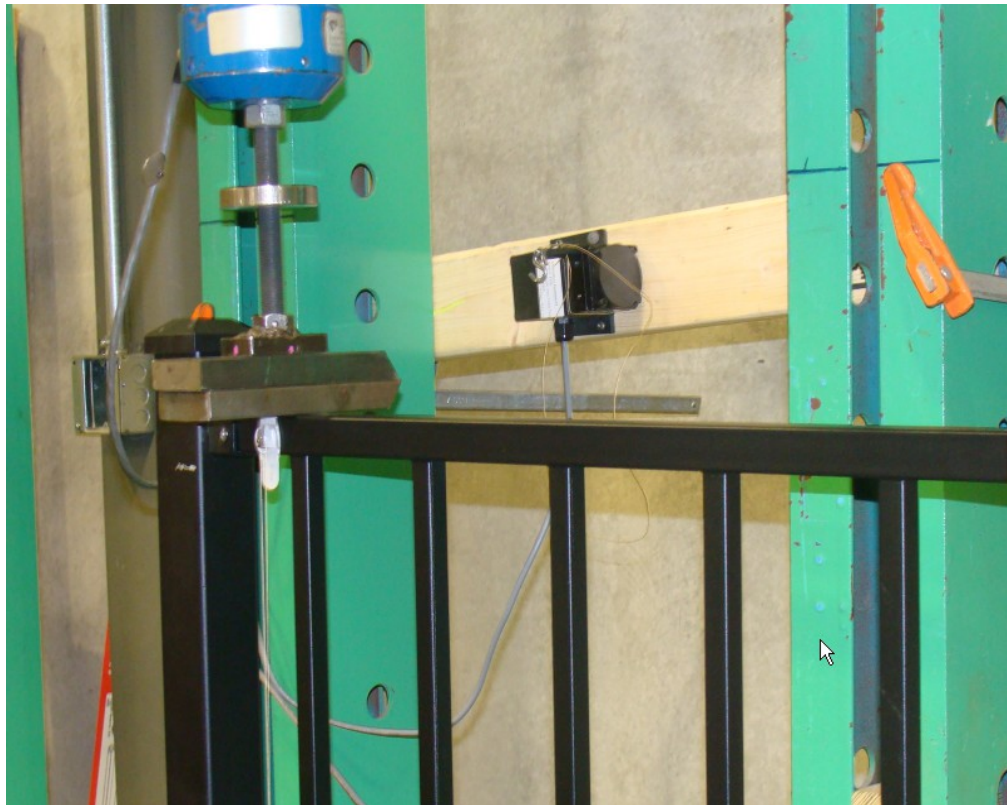


PHOTO 3: 200 lbf Load Applied – Vertical Near Post Connection



PHOTO 4: 400 lbf (50 plf Uniform) Load Applied – Vertical

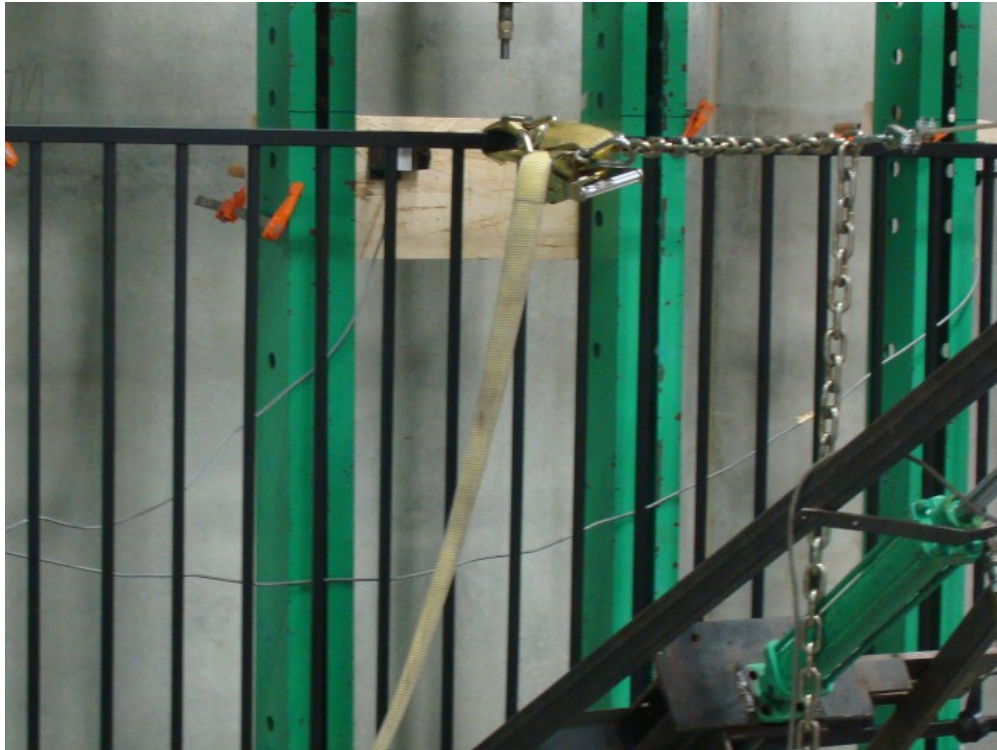


PHOTO 5:200 lbf Load Applied – Horizontal Midspan

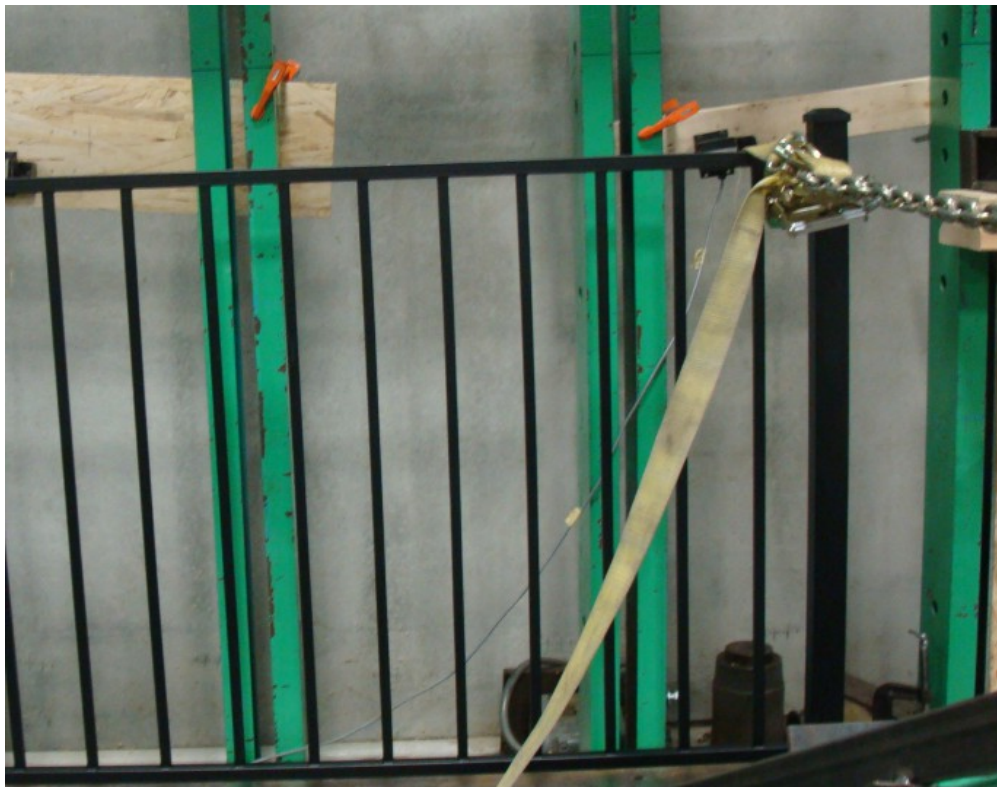


PHOTO 6:200 lbf Load Applied – Horizontal Near Post Connection



PHOTO 7: 50 lbf Load – Infill



PHOTO 8: 400 lbf (50 plf Uniform) Load Applied – Horizontal