



**PFS
Test
Report**



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**PFS TEST REPORT #09-147
ENDURANCE HAND RAIL
IBC 2006 AND IRC 2006 TESTING
(Editorially Revised to 2012 IBC and IRC Code)
FOR
RAILING DYNAMICS INCORPORATED
EGG HARBOR TOWNSHIP, NEW JERSEY**

GENERAL

The PFS Corporation, Cottage Grove, Wisconsin, performed client requested testing services for Railing Dynamics Incorporated, Egg Harbor Township, New Jersey. A PFS representative obtained the test materials by performing sampling services at the client’s facility. Testing is for RDI “Endurance” hand rail compliance evaluation with IBC 2006 and IRC 2006 hand rail requirements. The handrail test specimens were received in good order at PFS on October 23, 2009.

TEST SPECIMENS

Testing was performed on submitted handrail design as per client drawing “revised 10/9/09” RDI drawing “Hand Rail Test Setup” dated 9/24/09 (copy attached.).

The handrail test specimen consists of rail composed of an aluminum round tube with dimensions of 78-in-long, 1.29-in.-O.D.-by- 0.11-in.-wall round tube with 0.10-in.-wall vinyl cover. The rail is attached with powder coated aluminum brackets. The brackets attach to the rail with 2 #12 x 1-in.-long SS FH PH screws (predrilled using 13/64 drill bit). The mounting brackets are spaced at 72-in.-on-centers. A 3-in. overhang (measured from mounting bracket center to end of rail) occurs at each end. The rail system overall diameter was 1-1/2-in.

The handrail test assembly was mounted to a simulated wall consisting of a 4-by-6 treated Southern Pine dimension lumber with 3/8-in.-diamter steel through bolts. One bolt for each mounting bracket.

A new handrail and mounting brackets were used for each of the four tests.

TESTS AND REQUIREMENTS

IBC 2006 Requirements (IBC 2012 Requirements)

Sec. 1607.1 (Sec. 1607.8.1) Handrail assemblies and guard shall be designed to resist a load pf 50 plf applied in any direction at the top and to transfer this load through the supports to the structure.

- 1. Load applied vertical downward load .
- 2. Load applied horizontal away from supports.

Sec. 1607.7.1.1 (Sec. 1607.8.1.2) Handrail assemblies and guards shall be able to resist a single concentrated load of 200 pounds applied in any direction at any point along the top.

- 1. Load applied vertical downward directly above one support
- 2. Load applied vertical downward at center between supports



IRC 2006 Requirement (IRC 2012 Requirement)

Table R301.5 Guardrails and Handrails

A minimum concentrated load of 200 lbf applied in any direction at any point along the top.

TEST SET-UP

The tests were performed with a new set up for each of the four tests. The IBC concentrated load requirement is essentially the same as the IRC requirement and only performed once.

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 load was gradually applied until the test requirement force magnitude was obtained.

The concentrated load to mounting bracket used an approximately 1-in.-wide section of wood-plastic composite with concave area to match the handrail curvature. Concentrated load to mid-span was applied to rail with steel foot. See Photos No. 1 and No. 2

The 50 plf load test was applied with reactions points located at 1/3 of the test span. Note - 50 plf for 6-ft.-span is maximum of 300 lbf. See Photo No. 3

TEST RESULTS

The RDI Endurance Hand Rail test results met the IRC 2006 (IRC 2012) and IBC 2006 (IBC 2012) hand rail test requirements.

Test Witnessed and
Report Reviewed by:



Deepak Shrestha
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Report Prepared by:



James P. Van Schoyck
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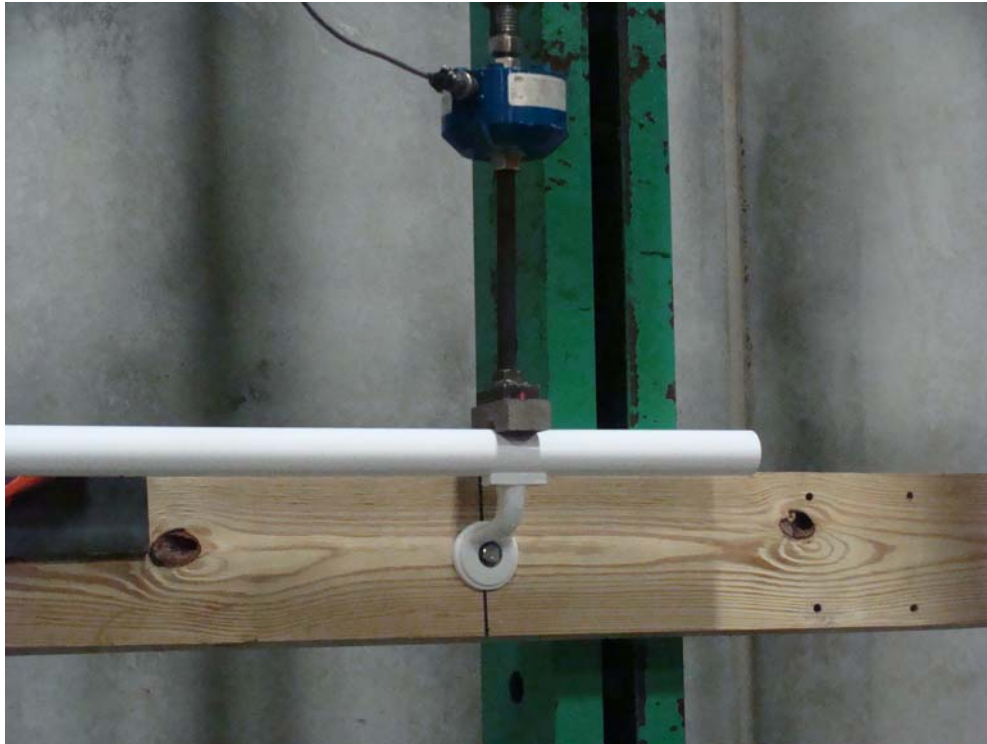


PHOTO 1. Concentrated Load at Support (photo taken at 200 lbf load).

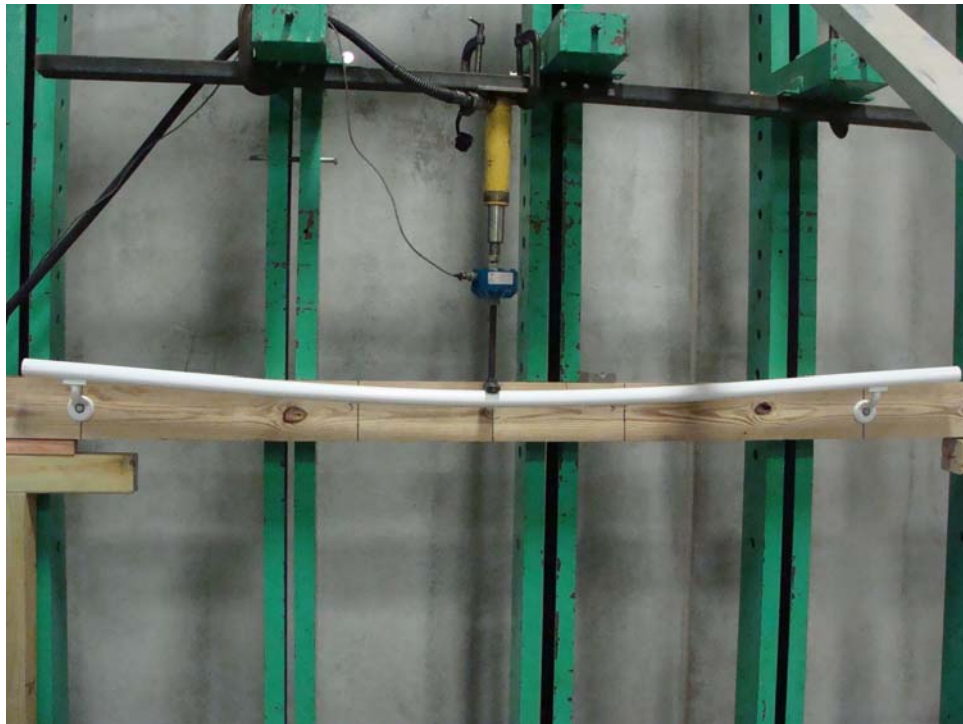


PHOTO 2. Concentrated Load at Mid-Span (photo taken at 200 lbf load)



PHOTO 3. 50 plf Load Applied – Horizontal (photo taken at 300 lbf)



PHOTO 4. 50 plf Load – Vertical (photo of set-up, no load applied)