PFS TEST REPORT #12-032_C

AZEK HAND RAIL TESTING
TO CONFIRM WITH
IBC 2012, IRC 2012 AND ASTM E985 LOAD
FOR
AZEK BUILDING PRODUCTS, INC.
SCRANTON, PA

By:
PFS Corporation
1507 Matt Pass
Cottage Grove, WI 53527
ENGINERED WOOD PRODUCTS
MDF panels, I-Joists, Rim-board, LVL, Trusses

WOOD-PLASTIC COMPOSITE LUMBER and GUARDRAIL SYSTEMS
Deck boards, Structural Elements, Guards, and Handrails

BUILDING STRUCTURAL COMPONENTS
Load Bearing Performance

STRUCTURAL INSULATED PANELS
Structural Performance and Adhesive Qualification

STRUCTURAL and CONSTRUCTION ADHESIVES
Exterior Wet-Use, Building Materials Product Use, Sub-floor, and General Purpose

ROOF COVERINGS and EXTERIOR SIDINGS
All types

FASTENERS and CONNECTIONS
Nails, Screws, Staples, Bolts, Connector Plates, Joist Hangers

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GENERAL

The PFS Corporation, Cottage Grove, Wisconsin, performed client requested testing services for AZEK Building Products, Inc., of Scranton, PA. The handrail test specimens were received in good order at PFS on May 1, 2012. The test was conducted on May 5, 2012.

TEST SPECIMENS

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

The handrail test specimen consisted of 78-in. long Azek Hand Rail composed of a 1.29-in. OD aluminum round tube with 0.11-in. nominal thickness with 0.10-in.-wall vinyl cover. The rail was attached with powder coated aluminum brackets spaced at 72-in.-on-centers. The brackets (HRBW) attach to the rail with 2 #12 x 1-in.-long SS FH PH screws (pre-drilled using 13/64 drill bit). A 3-in. overhang (measured from mounting bracket center to end of rail) occurred at each end. The rail system nominal diameter was 1-1/2-in.

One handrail assembly sample was fabricated and tested -

Handrail mounted on Azek composite post with a 3/8x2” lag bolt on each mounting bracket(Photos 1, 2). The mounting brackets were spaced at 6-ft on center. The Azek posts were securely fixed to the test frame.

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 handrail assemblies were tested according to ASTM E985-06, 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. Each handrail assembly was tested for the following six loading configurations -

1. 200 lbf concentrated load applied at the midspan vertically,
2. 200 lbf concentrated load applied at the midspan horizontally,
3. 200 lbf concentrated load applied at the bracket vertically
4. 200 lbf concentrated load applied at the bracket horizontally
5. 50 plf uniform load (300 lbf at quarter points) vertically,
6. 50 plf uniform load (300 lbf at quarter points) horizontally.

The tests were performed on one assembly with one load configuration at a time on the sample assembly. 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 50 plf uniform load test was applied with reactions points located at 1/4 of the test span.

The handrail assembly mounted on Azek posts did not show any sign of failure at the prescribed loads.

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:                        Report Prepared and
Jim Sheldon              Tests Witnessed by:
Lead Lab Technician                      Deepak Shrestha, PhD, PE
                                      General Manager – PFS Lab
PHOTO 1: Handrail mounted on Azek post

PHOTO 2: Handrail mounted on Azek post
PHOTO 3: 200 lbf Load Applied – Vertical Midspan

PHOTO 4: 200 lbf Load Applied – Horizontal Midspan
PHOTO 5: 200 lbf Load Applied – Vertical Support

PHOTO 6: 200 lbf Load Applied – Horizontal Support
PHOTO 7: 50 plf Load – Vertical (photo taken at 300 lbf)

PHOTO 8: 50 plf Load Applied – Horizontal (photo taken at 300 lbf)