TEST REPORT

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EVALUATION CENTER

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RENDERED TO

TITAN BUILDING PRODUCTS
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PRODUCT EVALUATED
Shadow Rail™ Connector

EVALUATION PROPERTY
Loads on Guards

Report of Testing Shadow Rail™ Connector for loads on guards as prescribed per the International Residential Code (2015).

1 Table of Contents

2 Introduction

Intertek Testing Services NA Ltd. (Intertek) has conducted testing for Titan Building Products, on Shadow Rail™ Connector, to evaluate load capacity for a 6 foot guardrail. Testing was conducted in accordance with loads on guards as prescribed by the International Building Code (2015) Section 1607.8.1.1 Concentrated Load for one – and two family dwellings. Factored loads applied were as given in Clause 6.2.4. of ASTM D7032 "Standard Specification for Establishing Performance Ratings for Wood –Plastic Composite and Plastic Lumber Deck Boards, Stair Treads, Guards and Handrails". This evaluation began July 7, 2016 and was completed July 21, 2016.

3 Test Samples

3.1. SAMPLE SELECTION

Samples were submitted to Intertek directly from the client. Samples were not independently selected for testing. The samples were received at the Evaluation Center on June 22, 2016.

3.2. SAMPLE AND ASSEMBLY DESCRIPTION

Titan Building Products submitted three pre-assembled guardrail test samples each consisting of two (2) 4 x 4 cedar wood posts 6 feet on center, 2 x 4 cedar wood top and bottom rails, and ¾ ″ diameter round aluminum infill balusters spaced at 4 inches on center. Post to rail attachment was achieved using the Shadow Rail™ Connector which were reported to be made with a polycarbonate thermoplastic material. The Shadow Rail™ Connector part number was identified by the Titan as TIS R24. The Shadow Rail™ Connector installation information is appended to this report.

The Shadow Rail™ Connector consisted of interlocking mating halves with one half fastened to the post and the other half fastened to the rail. Each Shadow Rail™ Connector was secured to the post and rail using two (2) #10 x 2 inch flat head wood screws. The guard infill balusters were secured with plastic spigots each fastened to the top and bottom rails with a single #8 x 1-1/2″ flat head wood screw.

4 Testing and Evaluation Methods

4.1. SPECIMEN PREPARATION

The guardrail assemblies were received fully assembled. Each guard assembly in turn was installed vertically in a guard testing frame. Loads were applied horizontally.

4.2. CONDITIONING

2016
The samples were tested in the laboratory under ambient conditions. No specific conditioning parameters were required before testing.

4.3. PROCEDURE

4.3.1 Horizontal Concentrated Load Applied to Top Rail at Midspan

The initial position of the top rail at mid span relative to a stationary reference was measured. A concentrated horizontal load of 200 lbf was applied to mid-span of the top rail using a 4″ square platen. The load cell/single ram/pump system held the loads for 1 minute. The horizontal displacement of the top rail was measured. The load was then released and the residual displacement of the top rail was measured.

A test load of 500 lbf was applied to mid span of the top rail and the rail movement was measured at full load and after removal of the test load. The system was evaluated for residual deflection, failure, evidence of disengagement of any component and visible cracks in any component.

4.3.2 Horizontal Concentrated Load Applied to Top Rail Adjacent to Post

The initial position of the top rail adjacent to post relative to a stationary reference was measured. A concentrated horizontal load of 200 lbf was applied to the top rail adjacent to the post using a 4” square platen. The load cell/single ram/pump system held the loads for 1 minute. The horizontal displacement of the top rail was measured. The load was then released and the residual displacement of the top rail was measured.

A test load of 500 lbf was applied to the top rail adjacent to the post and the rail movement was measured at full load and after removal of the test load. The system was evaluated for residual deflection, failure, evidence of disengagement of any component and visible cracks in any component.

The above loading procedure was repeated on the two additional guard assemblies submitted.

5 Testing and Evaluation Results

5.1. Horizontal Concentrated Load Applied to Top Rail at Midspan

Table 1. - Horizontal Concentrated Load - Top Rail at Midspan				
Load	**Specimen**	**Net Deflection (mm)**	**Residual Deflection (mm)**	**Observations**
200 lbf	1 2 3	24.0 24.5 23.5	0 0 1.0	After release of the load there was no evidence of disengagement or visible cracks in any component of the guard system
500 lbf	1 2 3	51.5 56.0 51.5	2.5 1.0 2.0	No other evidence of disengagement or visible cracks was observed in any component of the guard system

5.2. Horizontal Concentrated Load Applied to Top Rail Adjacent to Post

Table 2. - Horizontal Concentrated Load - Top Rail Adjacent to Post				
Load	**Specimen**	**Net Deflection (mm)**	**Residual Deflection (mm)**	**Observations**
200 lbf	1 2 3	0.50 0.75 3.9	1 0 0.25 3.7	After release of the load there was no evidence of disengagement or visible cracks in any component of the guard system
504 bf	1 2 3	1.0 1.5 4.3	1.0 1.0 3.5	No other evidence of disengagement or visible cracks was observed in any component of the guard system

5.3 Test Equipment

Description	Inventory Number
Powerfist 24" stroke hydraulic ram	--
Electric Hydraulic Pump	--
2.5 k Load Cell	280-01- 0713A Cal Due March 7, 2017
Read Out	280-01- 0713B Cal Due March 7, 2017
Tape Measure	280-01-1223 Cal Due Jan 28, 2017

6 Conclusion

Intertek Testing Services NA Ltd. (Intertek) has conducted testing for Titan Building Products, on Shadow Rail™ Connector, to evaluate load capacity for a 6 foot guardrail system. Testing was conducted in accordance with loads on guards as prescribed by the International Building Code (2015) Section 1607.8.1.1 Concentrated Load for one – and two family dwellings.

The Shadow Rail™ Connector achieved the concentrated load on guards reported in Section 5.0 of this report.

The conclusions of this test report may not be used as part of the requirements for Intertek product certification. Authority to Mark must be issued for a product to become certified.

INTERTEK TESTING SERVICES NA LTD.

Reported by:

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7 Appendix B: Photograph

Photo 1 Top Rail Loaded at Midspan

8 Revision Page

Revision No.	Date	Changes	Author	Reviewer
0	September 28, 2016	First issue	Vern Jones	Riccardo DeSantis

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