TEST REPORT

REPORT NUMBER: 101779576COQ-001B
ORIGINAL ISSUE DATE: January 13, 2015

EVALUATION CENTER

INTERTEK TESTING SERVICES NA LTD.
1500 BRIGANTINE DRIVE
COQUITLAM, BC V3K 7C1

RENDERED TO

FORTRESS RAILING PRODUCTS
1800 JAY ELL DRIVE SUITE 200
RICHERSON, TX 75081

PRODUCT EVALUATED:
AL[13] Aluminum Railing Posts

EVALUATION PROPERTY:
Load Requirements

Report of AL[13] Aluminum Railing Posts for compliance with the applicable requirements of the following criteria:

- **2010 *National Building Code of Canada***
  - **Section 9.8.8.2, *Loads on Guards***
- **2012 *Ontario Building Code***
  - **Section 9.8.8.2, *Loads on Guards***
- **2006 *Alberta Building Code***
  - **Section 9.8.8.2, *Loads on Guards***
- **2012 *British Columbia Building Code***
  - **Section 9.8.8.2, *Loads on Guards***

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2 Introduction

Intertek Testing Services NA Ltd. (Intertek) has conducted a test program on railing posts submitted by Fortress Railing Products. The evaluation was carried out to determine whether their AL^{13} Aluminum Railing Posts would resist the required loads for dwelling units and exterior guards serving not more than 2 dwelling units, as specified in the following Building Codes:

- 2010 *National Building Code of Canada* (NBC)
  - Section 9.8.8.2, *Loads On Guards*
- 2012 Ontario Building Code (OBC)
  - Section 9.8.8.2, *Loads On Guards*
- 2006 Alberta Building Code (ABC)
  - Section 9.8.8.2, *Loads On Guards*
- 2012 British Columbia Building Code (BCBC)
  - Section 9.8.8.2, *Loads On Guards*

This evaluation was conducted in the month of January 2015.

3 Test Samples

3.1. SAMPLE SELECTION

The client submitted three (3) posts to the Evaluation Center on November 13, 2014 (Coquitlam ID# VAN1411131031-001). Samples were not independently selected for testing.

3.2. SAMPLE AND ASSEMBLY DESCRIPTION

The specimens were identified as the AL^{13} Aluminum Railing Posts and were tested in the as-received condition.

4 Testing and Evaluation Methods

The test specimens were loaded at a rate to achieve the specified loads between 10 seconds and 5 minutes. The specified test loads were held for one minute before the load was released. As per Section 9.8.8.2 of the 2010 NBC, 2012 OBC, 2006 ABC, and 2012 BCBC, the following tests were conducted for use within dwelling units and exterior guards serving not more than 2 dwelling units:

4.1 2010 NBC/2012 OBC/2006 ABC/2012 BCBC: SECTION 9.8.8.2. *LOADS ON GUARDS*

1) The minimum specified horizontal load applied inward or outward at the top of every required guard shall be 0.5 kN/m or a concentrated load of 1.0 kN applied at any point

Notes:

1. A safety factor of 1.67 is applicable to the above loads.

4.2 CONCENTRATED LOAD TEST

Proof and ultimate load tests were conducted on each aluminum railing post per the above requirements. Each post was mounted into a universal reaction frame using four 3/8 in. Grade 5 bolts. The post to sub-structure fastener evaluation was not evaluated in the test report. The test

specimens were loaded horizontally at the level of the top rail (42 in.). Loads were applied at a continuous rate using a hydraulic pump and loading ram until the required proof load of 375 lbs was reached. The load was maintained for a period of one minute prior to being loaded to its maximum load. The ultimate load was measured using a calibrated S-type load cell. Upon completion of the test, each test specimen was inspected for damage and mode of failure. A total of three (3) samples were tested.

5 Testing and Evaluation Results

5.1. RESULTS AND OBSERVATIONS

The product test results are shown in Table 1 below and a copy of the test data is located in Appendix A.

Table 1. Test Results

Test Description	Specimen	Required Proof Load (lbf)	Pass/Fail	Maximum Load (lbf)	Average Load (lbf)
AL[13] Aluminum Railing Posts	1	375	Pass	761	777
	2	375	Pass	827	
	3	375	Pass	744	

6 Conclusion

The Fortress Railing Products AL[13] Aluminum Railing Posts identified and evaluated in this test report have complied with the concentrated load requirements on individual posts for guards within dwelling units and in exterior guards serving not more than 2 dwelling units, as specified in the following Building Codes:

- 2010 *National Building Code of Canada* (NBC)
  - Section 9.8.8.2, *Loads On Guards*
- 2012 Ontario Building Code (OBC)
  - Section 9.8.8.2, *Loads On Guards*
- 2006 Alberta Building Code (ABC)
  - Section 9.8.8.2, *Loads On Guards*
- 2012 British Columbia Building Code (BCBC)
  - Section 9.8.8.2, *Loads On Guards*

The product test results are presented in Section 5 of this report.

INTERTEK TESTING SERVICES NA LTD.

Reported by: _____
Chris Chang, P.Eng.
Engineer, Building Products

Reviewed by: _____
Dan Lungu, P. Eng.
Engineer, Manufactured Housing

Reviewed by: _____
Kal Kooner, P. Eng.
Manager, Building Products

APPENDIX A: Test Data (2 pages)

Company	Fortress Railing Products	Technician(s)	Kevin Penner/Chris Chang
Project No.	G101779576	Reviewer	Riccardo DeSantis
Models	AL[13] Aluminum Railing Posts	Start/End Date	January 7-9, 2014
Product Name	Same as above	Sample ID	VAN1411131031-001
Standard	**2010 NBC/2012 OBC/2006 ABC/2012 BCBC, Section 9.8.8.2**		

Test Data Package

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Test:	**Load on Posts**	Project:	G101779576
Date:	7-Jan-15	Eng/Tech:	Kevin Penner
Client:	Fortress Railing Products		Blair Hendry
Product:	**AL^{13} Aluminum Railing Posts**	Reviewer:	Riccardo DeSantis
Method:	2010 National Building Code of Canada, 9.8.8.2 Loads on Guards		
	2012 Ontario Building Code, 9.8.8.2 Loads on Guards		
	2006 Alberta Building Code, 9.8.8.2 Loads on Guards		
	2012 British Columbia Building Code, 9.8.8.2 Loads on Guards		
Safety Factor:	1.67 (based on a resistance factor Ø = 0.9 for aluminum)		
Equipment:	Artech 5000 lbf Load Cell (Intertek ID# P60690, cal due November 2015)		
	Vaisala Temp/RH Indicator (Intertek ID# 9-0176, cal due July 2015)		
	Stopwatch (Intertek ID# P60624, cal due July 2015)		
	Mitutoyo Digital Caliper (Intertek ID# 1019, cal due May 2015)		
Time/Temp/RH:	8:55AM / 21.0℃ / 49.0%		

Direction	Test	Design Load (Inward/Outward) (lbf)	Factored Load	Required Proof Load (lbf)	Deflections (in.)	Pass/Fail	Ultimate Load (lbf)	Average Load (lbf)
Outward	Top of Post	225	375	375	1.448	**Pass**	761.1	777
	Top of Post	225	375	375	1.159	**Pass**	826.9	
	Top of Post	225	375	375	1.234	**Pass**	744.1	

Direction	Test	Design Load (Inward/Outward) (kN)	Factored Load	Required Proof Load (kN)	Deflections (mm)	Pass/Fail	Ultimate Load (kN)	Average Load (kN)
Outward	Top of Post	1	1.67	1.67	36.8	**Pass**	3.39	3.46
	Top of Post	1	1.67	1.67	29.5	**Pass**	3.68	
	Top of Post	1	1.67	1.67	31.3	**Pass**	3.31	