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January 28, 2022

Project No. G104924854

Norm Plumb
East & West Aluminum Craft Ltd.
7465 Conway Ave.
Burnaby, BC, V5E 2P7
Canada

Ph: 604-438-6261
Email: norm@ewalumcraft.com

Subject: Findings Letter Report 104924854COQ-001 REV

Dear Norm Plumb,

Intertek has conducted testing for East & West Aluminum Craft Ltd. on one (1) 1070 mm (42-1/8 in.) high x 48 in. long STAR "Classic" picket railing system with 5/8" x 5/8" x 0.050" wall thickness infill pickets spaced at 99.398 mm o/c. Testing was conducted in accordance with ASTM E935-21, *Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings* with reference to the following load requirements of the following:

- 2015 National Building Code of Canada (NBC)
  - Section 4.1.5.14 *Loads on Guards and Handrails*
    - Clause (3) – *Individual elements within the guard, including solid panels and pickets, shall be designed for a load of 0.5 kN applied outward over an area of 100 mm by 100 mm located at any point in the element or elements so as to produce the most critical effect.*
    - Clause (4) – *The size of the opening between any two adjacent vertical elements within a guard shall not exceed the limits required by Part 3 when each of these elements is subjected to a specified live load of 0.1 kN applied in opposite directions in the in-plane direction of the guard so as to produce the most critical effect*.

The sample railing was received at the Evaluation Center on January 20, 2022 (Coquitlam ID# VAN2201270910-001). Testing has been completed and results can be found in the table below:

SECTION	PROPERTY	TEST RESULTS	REQUIREMENT	PASS/FAIL
4.1.5.14, Clause (3)	In-Fill Load Test	0.83 kN (187 lbs)	0.83 kN (187 lbs) for 1 min.	Pass
4.1.5.14, Clause (4)	Size of Opening Test	98.1 mm at 0.1 kN (22.5 lbs)	< 100 mm at 0.1 kN (22.5 lbs)	Pass

If there are any questions regarding the results contained in this report, or any of the other services offered by Intertek, please do not hesitate to contact the undersigned.

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COMPLETED BY:	Chris Chang	**REVIEWED BY:**	Baldeep Sandhu
TITLE:	Senior Tech – Building & Construction	**TITLE:**	Manager – Building & Construction
SIGNATURE:		**SIGNATURE:**	
DATE:	01/28/22	**DATE:**	01/28/22

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APPENDIX A – TEST DATA (2 PAGES)

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Company	East & West Aluminum Craft Ltd.	Technician(s)	Chris Chang / Kevin Penner
Project No.	G104924854	Reviewer	Baldeep Sandhu
Models	4 ft. rail with 5/8 in. pickets (0.050 in.)	Start/End Date	January 27, 2022
Product Name	Same as above	Sample ID	VAN2201270910-001
Standard	**2015 NBC, Section 4.1.5.14, Clause (3) and (4)**		

Test Data Package

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Load on Guards	2

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Test:	**Loads on Guards - Outwards (Commercial)**	Project:	G104924854
Date:	27-Jan-22	Eng/Tech:	Chris Chang
Client:	East & West Aluminum Craft Ltd.		Kevin Penner
Product:	**4 ft. rail with 5/8 in. pickets (0.050 in.)**	Reviewer:	Baldeep Sandhu
	3.913 in. o/c picket spacing	Location:	Coquitlam, BC, Canada

Post Spacing:	4.00	ft	1.22	m
Height of Guard:	42	in	1067	mm
Opening in Guard:	3.29	in	84	mm

Method: 2015 National Building Code of Canada, 4.1.5.14 Loads on Guards and Handrails, Clause (3) and (4)
Safety Factor: 1.67 (based on a resistance factor Ø = 0.9 for aluminum)
Equipment: Artech 1000 lbf Load Cell (Intertek ID# P60688, cal due June 4, 2022)
Stopwatch (Intertek ID# P60444, cal due March 5, 2022)
Mitutoyo Digital Caliper (Intertek ID# 52650, cal due June 8, 2022)
T&D TR-72Ui Temperature and Humidity Logger (Intertek ID# P60554, cal due September 26, 2022)
Micro Mule Measurement System (Intertek ID# D7810, cal due April 29, 2022)
Tyco Electronics Linear Transducer (Intertek ID# D7817, cal due March 15, 2022)
Time/Temp/RH: 10:30AM / 22.1°C / 48.0%

Direction	Test	Design Load (Inward/ Outward) (lbf)	Factored Load	Calculated Moment (lbf-ft)	Equivalent Quarter-Point Load (lbf)	Required Proof Load (lbf)	Deflections (in.)	Pass/Fail
Outward	Individual Elements (over 4 in. x 4 in.)	112	187	-	-	187	2.281	**Pass**
In-plane	Size of Opening	22.5	-	-	-	22.5	3.861	**Pass**

Direction	Test	Design Load (Inward/ Outward) (kN)	Factored Load	Calculated Moment (kNm)	Equivalent Quarter-Point Load (kN)	Required Proof Load (kN)	Deflections (mm)	Pass/Fail
Outward	Individual Elements (over 100 mm in. x 100 mm)	0.5	0.83	-	-	0.83	57.9	**Pass**
In-plane	Size of Opening	0.1	-	-	-	0.10	98.1	**Pass**

Note (1) – The supporting structure attachment was outside the scope of this evaluation and is subject to evaluation and approval by the Engineer of Record and Authority Having Jurisdiction (AHJ). The guard assembly was attached to a rigid test support using steel plates with four (4) 3/8 in. Grade 5 bolts on each post.

Note (2) – The rail section was oriented for testing so horizontal seam line in the top rail faced outwards.

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APPENDIX B – PHOTOS (1 PAGE)

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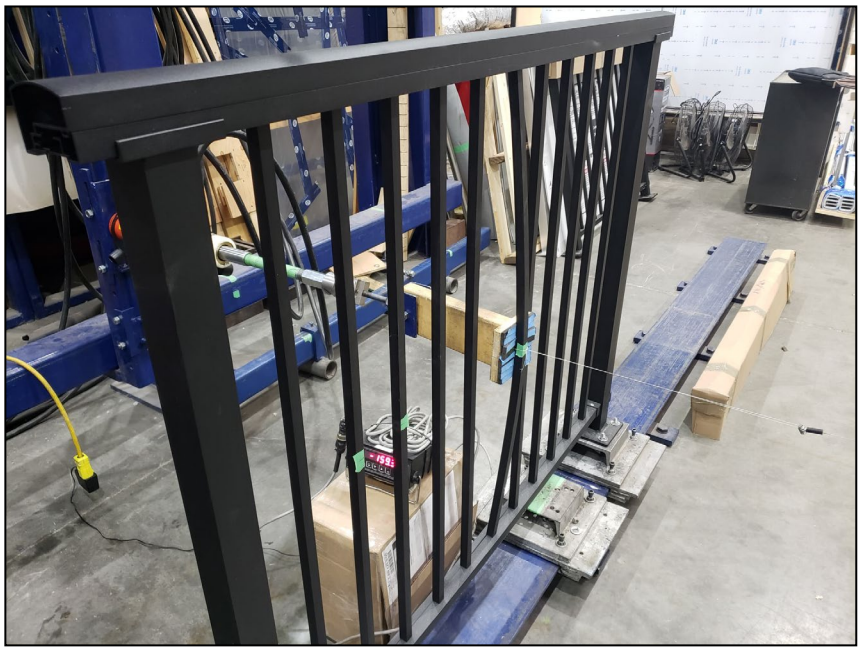

Figure 1. 2015 NBC, Section 4.1.5.14, Clause (3): In-Fill Load Test

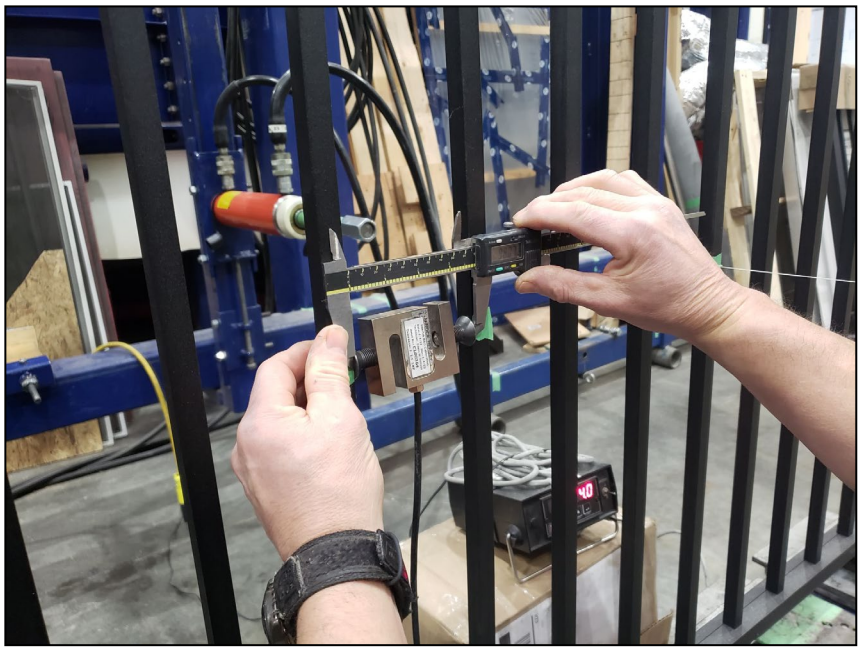

Figure 2. 2015 NBC, Section 4.1.5.14, Clause (4): Size of Opening Test

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