

VISTA RAILING SYSTEMS INC. TEST REPORT

SCOPE OF WORK

REPORT OF 36 IN. HORIZONTAL RAILING TESTED IN ACCORDANCE WITH ASTM E935-21,
*STANDARD TEST METHODS FOR PERFORMANCE OF PERMANENT METAL RAILING SYSTEMS
AND RAILS FOR BUILDINGS*

REPORT NUMBER

105793764COQ-001

TEST DATES

04/09/24

ISSUE DATE

04/29/24

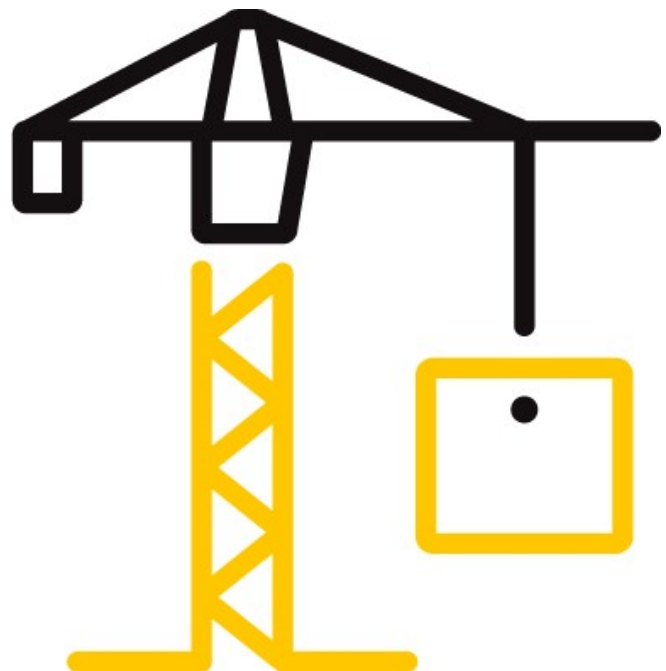
PAGES

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DOCUMENT CONTROL NUMBER

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TEST REPORT FOR VISTA RAILING SYSTEMS INC.

Report No.: 105627913COQ-001

Date: 04/29/24

REPORT ISSUED TO

VISTA RAILING SYSTEMS INC.

23282 River Road

Maple Ridge, BC, V2W 1B6

Canada



SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by Vista Railing Systems Inc., 23282 River Road, Maple Ridge, BC, V2W 1B6, Canada to perform testing on their 36 in. Horizontal Rail product in accordance with ASTM E935-21, *Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings*. The scope of the testing as requested by Vista Railing Systems Inc. was to assess the ability of the guard system to resist the load requirements of Section 1607.9.1 of the 2021 IBC and R301.5 of the 2021 IRC. Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at the Intertek test facility in Coquitlam, BC, Canada on April 9, 2024.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

For INTERTEK B&C:

COMPLETED BY:	Chris Chang, P.Eng.	REVIEWED BY:	Baldeep Sandhu
TITLE:	Sr. Technician – Building & Construction	TITLE:	Manager – Building & Construction
SIGNATURE:	 EGBC Permit No.: 1000953	SIGNATURE:	
DATE:	04/29/24	DATE:	04/29/24

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SECTION 2

SUMMARY OF TEST RESULTS

SYSTEM DESCRIPTION	TEST	PASS/FAIL
36 in. Horizontal Rail (6 ft. o/c span)	In-fill Load	Pass
	Uniform Load	Pass
	Horizontal – Mid-Span Concentrated Load	Pass
	Horizontal – Adjacent to Post Concentrated Load	Pass
	Horizontal – Top of Post Concentrated Load	Pass

Refer to Appendix B for photos of testing.

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SECTION 3

TEST METHOD

The guard specimen was evaluated in accordance with the following:

ASTM E935-21, *Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings.*

The required test loads were based on the Specified Loads per the following Building Code articles with the Safety Factors applied as indicated in this report.

2021 International Building Code (IBC)

- Section 1607.9.1 *Handrails and Guards*

2021 International Residential Code (IRC)

- R301.5 *Live Load*

SECTION 4

MATERIAL SOURCE

The client submitted the guard system to the Evaluation Center on April 8, 2024 (Coquitlam ID# VAN2404081529-001). The sample was received in good condition and was suitable for testing unless noted otherwise. The sample was not independently selected for testing.

SECTION 5

EQUIPMENT

Calibration of test equipment was performed by Intertek B&C in accordance with ISO 17025 requirements.

ASSET #	DESCRIPTION	MODEL	CAL DUE DATE
P60692	Artech 5k lb S-Type Load Cell	20210-5k	01/15/25
P60610	T&D Temperature and Humidity Indicator	TR-72Ui	08/30/24
P60624	Extech Stopwatch	365515	12/15/24
52650	Mitutoyo 8 in. Digital Caliper	CD-8	06/22/24
P60494	Stanley Tape Measure	FatMax	10/19/24

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SECTION 6

LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Jason Komorski	Intertek B&C
Chris Chang	Intertek B&C

Note: The above observer(s) witnessed part of the test program.

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SECTION 7**TESTING PROCEDURE**

The evaluation was conducted in accordance with the testing procedures of ASTM E935-21, *Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings*. The test specimen was 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. Testing was conducted with reference to the specified load requirements of the following:

IN-FILL LOAD TEST

The in-fill load test was conducted in accordance with Section 1607.9.1.2 *Guard Component Loads* of the 2021 IBC and Table R301.5 *Minimum Uniformly Distributed Live Loads* of the 2021 IRC. Testing was conducted with reference to Section 4.5.1 *Loads on Handrail and Guardrail Systems* of ASCE/SEI 7-10, *Minimum Design Loads for Buildings and Other Structures* with a safety factor of 2.5. A load of 125 lbs was applied using a 1 square foot block normal to the in-fill. After release of the load, the system was evaluated for failure, any evidence of disengagements of any component and/or visible cracking from any component.

UNIFORM LOAD TEST

The uniform load test was conducted in accordance with Section 1607.9.1 *Handrails and Guards* of the 2021 IBC and Table R301.5 *Minimum Uniformly Distributed Live Loads* of the 2021 IRC. Testing was conducted with reference to Section 4.5.1 *Loads on Handrail and Guardrail Systems* of ASCE/SEI 7-10, *Minimum Design Loads for Buildings and Other Structures* with a safety factor of 2.5. The top rail of the guardrail system was subjected to a uniform load of 125 plf applied horizontally. The load was applied using quarter point loads. After release of the load, the system was evaluated for failure, any evidence of disengagements of any component and visible cracks in any component.

CONCENTRATED LOAD TEST

The concentrated load tests were conducted in accordance with Section 1607.9.1.1 *Concentrated Load* of the 2021 IBC and Table R301.5 *Minimum Uniformly Distributed Live Loads* of the 2021 IRC. Testing was conducted with reference to Section 4.5.1 *Loads on Handrail and Guardrail Systems* of ASCE/SEI 7-10, *Minimum Design Loads for Buildings and Other Structures* with a safety factor of 2.5. The top rail of the guardrail system was subjected to three (3) separate horizontal tests where a concentrated load of 500 lbs was applied:

- horizontally at the mid-span of the top rail, and
- horizontally at the top rail adjacent to the post connection to verify the connection capacity, and
- horizontally on the post at 36 in. height.

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After release of the load, the system was evaluated for failure, any evidence of disengagements of any component and/or visible cracking from any component.

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SECTION 8

TEST SPECIMEN DESCRIPTION

The sample was identified as the following:

TABLE 1. RAILING CONFIGURATION						
PART NAME	QTY	PART DIMENSIONS				REPORTED MATERIAL
		LENGTH	WIDTH	HEIGHT	NOMINAL THICKNESS	
Post	2	2.50 in.	2.50 in.	33.75 in.	0.10 in.	Aluminum
Sleeve		3.25 in.	2.50 in.	2.25 in.	0.08 in.	Aluminum
Baseplate	2	4.00 in.	4.00 in.	0.25 in.	N/A	Aluminum
Top Rail	1	72.00 in.	2.38 in.	2.50 in.	0.07 in.	Aluminum
Bottom Rail	1	72.00 in.	1.00 in.	1.63 in.	0.06 in.	Aluminum
Infill – Horizontal Picket	6	71.5 in.	1.00 in.	1.00 in.	0.06 in.	Aluminum
Support Leg	1	1.63 in.	1.00 in.	2.5 in.	0.13 in.	Aluminum

Note 1: The railing had one (1) support leg positioned under the bottom rail spaced at mid-span and was set on a steel test frame. For detailed drawings of the test samples and components, refer to Appendix C.

Note 2: The supporting structure attachment was outside the scope of this evaluation, and is subject to evaluation and approval by the Engineer of Record and the Authority Having Jurisdiction (AHJ). The assemblies were attached to a rigid test support using steel plates with four (4) 3/8 in. Grade 5 bolts on each post.

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SECTION 9

TEST RESULTS

A full set of test results is included in Appendix A.

SECTION 10

CONCLUSION

Intertek Testing Services NA Ltd. (Intertek) has conducted testing for Vista Railing Systems Inc. on their 36 in. Horizontal Rail product per ASTM E935-21, *Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings*. The scope of the testing as requested by Vista Railing Systems Inc. was to assess the ability of the guard system to resist the loads as prescribed in the following building code articles:

2021 International Building Code (IBC)

- Section 1607.9.1 *Handrails and Guards*

2021 International Residential Code (IRC)

- R301.5 *Live Load*

The Vista Railing Systems Inc. 36 in. Horizontal Rail product identified and evaluated in this report has met the load requirements of the above criteria. Overall compliance with the Building Codes must be evaluated and approved by the Engineer of Record and Authority Having Jurisdiction.

The conclusions of this test 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.



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SECTION 11

APPENDIX A – TEST DATA (2 PAGES)

Company	Vista Railing Systems Inc.	Technician(s)	Jason Komorski
Project No.	G105793764	Reviewer	Baldeep Sandhu
Models	36 in. Horizontal Railing	Start/End Date	April 9, 2024
Product Name	Same as above	Sample ID	VAN2404081529-001
Standard	2021 IBC/IRC		

Test Data Package

Table of Contents

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36 in. Horizontal Railing	2

Test: **Loads on Guards**
 Date: 9-Apr-24
 Client: Vista Railing Systems Inc.
 Product: **Aluminum Railing System - Horizontal Rails - Deck Mount**
 Post Spacing: 6.17 ft 1.88 m
 Height of Guard: 36.0 in 914 mm
 Opening in Guard: 3.38 in 86 mm (between slats)
 2.50 in N/A mm (under bottom rail)

Project: G105793764
 Eng/Tech: Jason Komorski
 Reviewer: Baldeep Sandhu
 Location: Coquitlam, BC, Canada

Method: ASTM E935-21, *Standard Test Methods for Performance of Permanent Railing Systems and Rails for Buildings*
 2021 International Building Code (IBC)
 2021 International Residential Code (IRC)

Safety Factor: 2.50

Equipment: Artech 5000 lbf Load Cell (Intertek ID# P60692 cal due Jan 15, 2025)
 T&D TR-72Ui Temperature and Humidity Logger (Intertek ID# P60610, cal due August 30, 2024)
 Stopwatch (Intertek ID# P60624, cal due December 15, 2024)
 Mitutoyo Digital Caliper (Intertek ID# 52650 cal due June 22, 2024)
 Stanley Tape Measure (Intertek ID# P60494, cal due October 19, 2024)

Time/Temp/RH: 1:00PM/18.6°C/38%

Direction	Test	Design Load (Inward/Outward) (lbf)	Factored Load	Calculated Moment (lbf-ft)	Equivalent Quarter-Point Load (lbf)	Required Proof Load (lbf)	Pass/Fail
Outward	Individual Elements (over 12 in. x 12 in.) (most critical location)	50	125	-	-	125	Pass
	Midspan Horizontal Concentrated Load	200	500	-	-	500	Pass
	Top Rail Adjacent to Connection Concentrated Load	200	500	-	-	500	Pass
	Top of Post	200	500	-	-	500	Pass
	Horizontal Uniform Load (per ft)	50	125	594	385	771	Pass

Direction	Test	Design Load (Inward/Outward) (kN)	Factored Load	Calculated Moment (kNm)	Equivalent Quarter-Point Load (kN)	Required Proof Load (kN)	Pass/Fail
Outward	Individual Elements (over 305 mm in. x 305 mm) (most critical location)	0.22	0.56	-	-	0.56	Pass
	Midspan Horizontal Concentrated Load	0.89	2.22	-	-	2.22	Pass
	Top Rail Adjacent to Connection Concentrated Load	0.89	2.22	-	-	2.22	Pass
	Top of Post	0.89	2.22	-	-	2.22	Pass
	Horizontal Uniform Load (per m)	0.73	1.83	0.81	1.72	3.43	Pass



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SECTION 11

APPENDIX B – PHOTOS (2 PAGES)

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Figure 1. In-Fill Load Test



Figure 2. Midspan of Top Rail Concentrated Load Test

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Figure 3. Adjacent to Post Connection Concentrated Load Test



Figure 4. Uniform Load Test



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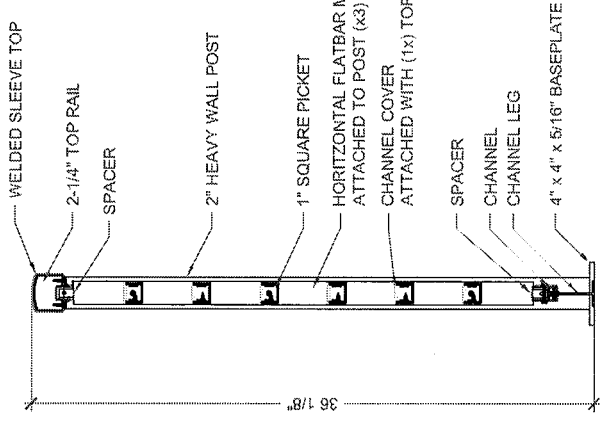
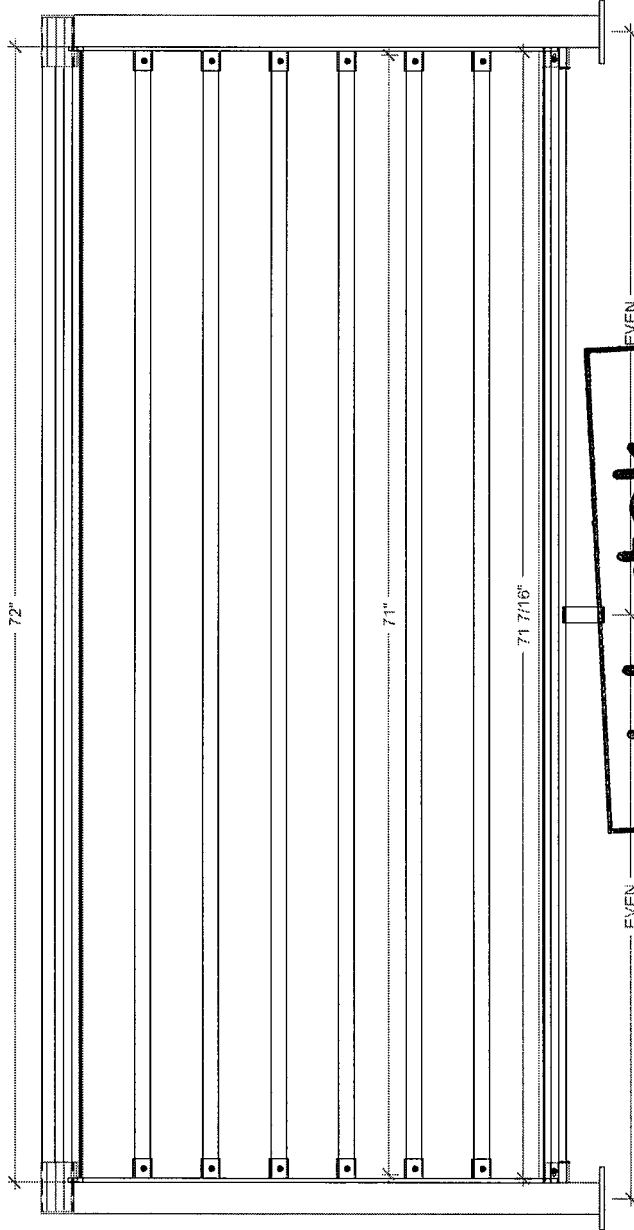
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SECTION 12

APPENDIX C – DRAWINGS (2 PAGES)



SECTION DETAIL

ELEVATION

intertek

Test sample complies with these details.
Deviations are noted.

Report #: 10579376400-001

Date: 04/29/24 Tech: C.C.

Manufactured by...

Vista

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Fax: 604-467-1127 www.vistadrainage.com

PROJECT: INTERTEK TESTING

LOCATION:

CLIENT:

ALUMINUM GUARDRAILS	
DRAWN	DL
DATE	2024-04-19
SCALE	1-1/2" = 1'-0"
PROJECT No.	-
REVISION #	0
CHECKED	-

PLEASE NOTE: these are not engineered or tested components. You are responsible and liable for ensuring these components are suitable, site engineered, and meet any/all applicable codes and engineering for your application. Vista Railing Systems Inc., assumes no responsibility or liability for fitness of use.

ELEVATION & SECTION DETAIL

DRAWING # 36" HORIZONTAL 6' PICKET INTERTEK TEST

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