

VISTA RAILING SYSTEMS INC. TEST REPORT

SCOPE OF WORK

REPORT OF 6 FT. FASCIA BRACKET ALUMINUM RAILING SYSTEM – 6 MM GLASS PANEL
TESTED IN ACCORDANCE WITH SELECTED SECTIONS OF ASTM E2353-21, *STANDARD TEST
METHODS FOR PERFORMANCE OF GLAZING IN PERMANENT RAILING SYSTEMS, GUARDS,
AND BALUSTRADES*

REPORT NUMBER

105224861COQ-002C

TEST DATES

03/29/23

ISSUE DATE

04/26/23

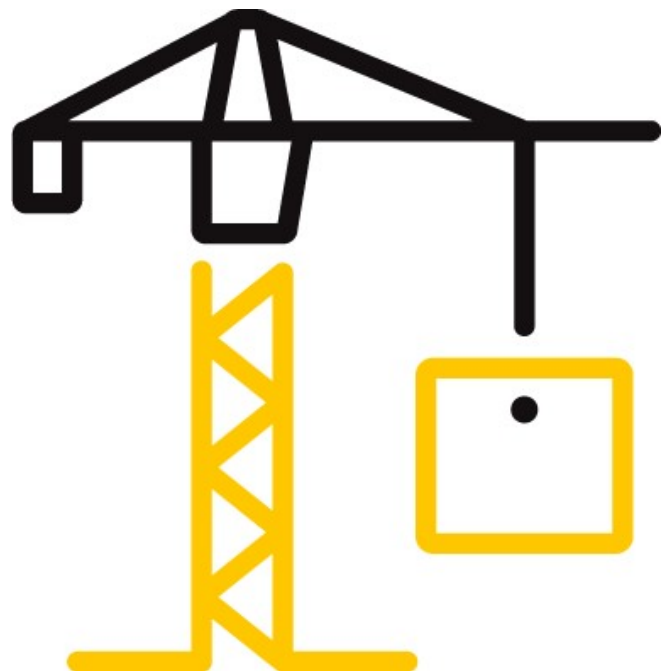
PAGES

22

DOCUMENT CONTROL NUMBER

GFT-OP-10c (09/29/20)

© 2020 INTERTEK



TEST REPORT FOR VISTA RAILING SYSTEMS INC.

Report No.: 105224861COQ-002C

Date: 04/26/23

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 the 6 ft. Fascia Bracket Aluminum Railing System – 6 mm Glass Panel in accordance with selected sections of ASTM E2353-21, *Standard Test Methods for Performance of Glazing in Permanent Railing Systems, Guards, and Balustrades*. The scope of the testing as requested by Vista Railing Systems Inc., was to assess the ability of the guard systems to resist the load requirements of Section 1607.9.1 of the 2021 IBC and R301.5 of the 2021 IRC for “one- and two-family dwellings.” 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 March 29, 2023.

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

For INTERTEK B&C:

| | | | |
|-------------------|---|-------------------|---|
| COMPLETED | | REVIEWED | |
| BY: | Jason Komorski | BY: | Baldeep Sandhu |
| | Technician – | | Manager – |
| TITLE: | Building & Construction | TITLE: | Building & Construction |
| |  | |  |
| SIGNATURE: | | SIGNATURE: | |
| DATE: | 04/26/23 | DATE: | 04/26/23 |

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample(s) tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

TEST REPORT FOR VISTA RAILING SYSTEMS INC.

Report No.: 105224861COQ-002C

Date: 04/26/23

SECTION 2

SUMMARY OF TEST RESULTS

| SYSTEM DESCRIPTION | TEST | PASS/FAIL |
|---|---|-----------|
| 6 ft. Fascia Bracket Aluminum Railing System - 6 mm Glass Panel | In-fill 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.

TEST REPORT FOR VISTA RAILING SYSTEMS INC.

Report No.: 105224861COQ-002C

Date: 04/26/23

SECTION 3

TEST METHOD

The guard specimen was evaluated in accordance with the following:

ASTM E2353-21, *Standard Test Methods for Performance of Glazing in Permanent Railing Systems, Guards, and Balustrades*, Section 12.1.1 *Static Load Testing*

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* for “one- and two-family dwellings”

2021 International Residential Code (IRC)

- R301.5 *Live Load* for “one- and two-family dwellings”

Per the client’s request, the *Shot Bag Impact Test* per Section 12.2 and the *Pendulum Impact Test* per Section 12.3 were not conducted per ASTM E2353.

SECTION 4

MATERIAL SOURCE

The client submitted the railing system to the Evaluation Center on March 21, 2023 (Coquitlam ID# VAN2303211010-001). The sample was received in good condition and was suitable for testing unless noted otherwise. The sample was not independently selected for testing.

TEST REPORT FOR VISTA RAILING SYSTEMS INC.

Report No.: 105224861COQ-002C

Date: 04/26/23

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 | 12/12/23 |
| P60554 | T&D Temperature and Humidity Indicator | TR-72Ui | 10/19/23 |
| P60624 | Extech Stopwatch | 365515 | 12/07/23 |
| 52650 | Mitutoyo 8 in. Digital Caliper | CD-8 | 06/08/23 |
| P60494 | Stanley Tape Measure | FatMax | 10/14/23 |

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.

TEST REPORT FOR VISTA RAILING SYSTEMS INC.

Report No.: 105224861COQ-002C

Date: 04/26/23

SECTION 7**TESTING PROCEDURE**

The evaluation was conducted in accordance with Section 12.1.1 *Static Load Testing* of ASTM E2353-21, *Standard Test Methods for Performance of Glazing in Permanent Railing Systems, Guards, and Balustrades*, with reference to ASTM E935-21, *Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings*. 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. 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 4. A load of 200 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.

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,
- horizontally at the top rail adjacent to the post connection to verify the connection capacity, and
- horizontally at the top of the post.

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.

TEST REPORT FOR VISTA RAILING SYSTEMS INC.

Report No.: 105224861COQ-002C

Date: 04/26/23

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 | 2.00 in. | 2.00 in. | 39.75 in. | 0.11 in. | Aluminum |
| Fascia Post | 2 | 2.00 in. | 2.00 in. | 7.25 in. | 0.17 in. | Aluminum |
| Spigot | 2 | 1.72 in. | 1.72 in. | 6.50 in. | 0.17 in. | Aluminum |
| Baseplate | 4 | 4.00 in. | 4.00 in. | 0.38 in. | - | Aluminum |
| Top Rail | 1 | 72.00 in. | 2.30 in. | 2.60 in. | 0.06 in. | Aluminum |
| Bottom Rail | 1 | 72.00 in. | 1.06 in. | 1.64 in. | 0.06 in. | Aluminum |
| Top Rail Bracket | 2 | 3.78 in. | 2.52 in. | 2.40 in. | 0.06 in. | Aluminum |
| Intermediate Support Picket | 1 | 0.63 in. | 0.63 in. | 36.00 in. | 0.03 in. | Aluminum |
| Infill - Glass | 1 | - | 66.00 in. | 36.00 in. | 0.24 in. | Glass |

Note 1: For detailed drawings of the test samples and components, refer to Appendix C.

TEST REPORT FOR VISTA RAILING SYSTEMS INC.

Report No.: 105224861COQ-002C

Date: 04/26/23

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 the 6 ft. Fascia Bracket Aluminum Railing System – 6 mm Glass per selected sections of ASTM E2353-21, *Standard Test Methods for Performance of Glazing in Permanent Railing Systems, Guards, and Balustrades*. The scope of the testing as requested by Vista Railing Systems Inc. was to assess the ability of the guard systems to resist the loads as prescribed in the following building code articles:

2021 International Building Code (IBC)

- Section 1607.9.1 *Handrails and Guards* for “one- and two-family dwellings”

2021 International Residential Code (IRC)

- R301.5 *Live Load* for “one- and two-family dwellings”

The Vista Railing Systems Inc. 6 ft. Fascia Bracket Aluminum Railing System – 6 mm Glass Panel 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.



Total Quality. Assured.

1500 Brigantine Drive
Coquitlam, BC, V3K 7C1

Telephone: 604-520-3321
Facsimile: 604-524-9186
www.intertek.com

TEST REPORT FOR VISTA RAILING SYSTEMS INC.

Report No.: 105224861COQ-002C

Date: 04/26/23

SECTION 11

APPENDIX A – TEST DATA (2 PAGES)

TEST REPORT FOR VISTA RAILING SYSTEMS INC.

Report No.: 105224861COQ-002C

Date: 04/26/23



Total Quality. Assured.

Test Data Package Page 1 of 2

| | | | |
|--------------|---|----------------|-----------------------------|
| Company | Vista Railing System | Technician(s) | Chris Chang, Jason Komorski |
| Project No. | G105224861 | Reviewer | Baldeep Sandhu |
| Models | Glass | Start/End Date | March 29, 2023 |
| Product Name | Same as above | Sample ID | VAN2303211010-001 |
| Standard | 2021 International Building Code (IBC), 2021 International Residential Code (IRC) | | |

Test Data Package

Table of Contents

| Sheet | Page |
|--------------------------------|------|
| Table of Contents (This Sheet) | 1 |
| Glass Aluminum Railing | 2 |

TEST REPORT FOR VISTA RAILING SYSTEMS INC.

Report No.: 105224861COQ-002C

Date: 04/26/23



| | | | |
|-------------------|---|-----------|-----------------------|
| Test: | Loads on Guards | Project: | G105224861 |
| Date: | 29-Mar-23 | Eng/Tech: | Jason Komorski |
| Client: | Vista Railing Systems Inc. | | Chris Chang |
| Product: | Aluminum Glass Railing System - Fascia Mount | Reviewer: | Baldeep Sandhu |
| Post Spacing: | 6.17 ft 1.88 m | Location: | Coquitlam, BC, Canada |
| Height of Guard: | 42 in 1067 mm | | |
| Opening in Guard: | 3.00 in 76 mm | | |
| Method: | 2021 International Building Code (IBC) 2021 International Residential Code (IRC) | | |
| Safety Factor: | 2.50 4.00 | | |
| Equipment: | Artech 5000 lbf Load Cell (Intertek ID# P60692, cal due December 8, 2023) T&D TR-72Ui Temperature and Humidity Logger (Intertek ID# P60554, cal due October 19, 2023) Stopwatch (Intertek ID# P60624, cal due December 7, 2023) | | |
| Time/Temp/RH: | 2:30/71.0°F/30% | | |

| 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 | 200 | - | - | 200 | 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 |

| 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 | 0.89 | - | - | 0.89 | 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 |

Mode of Failure: N/A



Total Quality. Assured.

1500 Brigantine Drive
Coquitlam, BC, V3K 7C1

Telephone: 604-520-3321
Facsimile: 604-524-9186
www.intertek.com

TEST REPORT FOR VISTA RAILING SYSTEMS INC.

Report No.: 105224861COQ-002C

Date: 04/26/23

SECTION 11

**APPENDIX B – 6 FT. FASCIA BRACKET ALUMINUM RAILING SYSTEM – 6 MM GLASS PHOTOS
(2 PAGES)**

TEST REPORT FOR VISTA RAILING SYSTEMS INC.

Report No.: 105224861COQ-002C

Date: 04/26/23

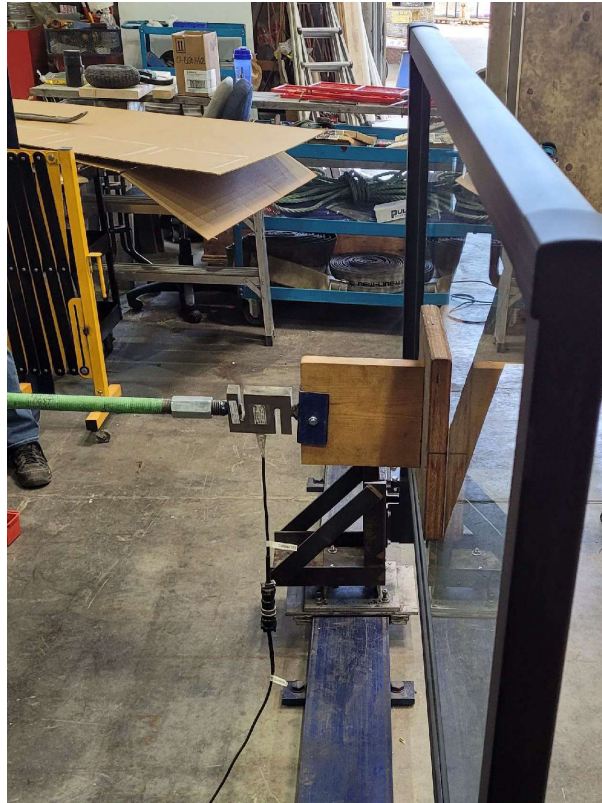


Figure 1. In-fill Load Test on Intermediate Support Picket

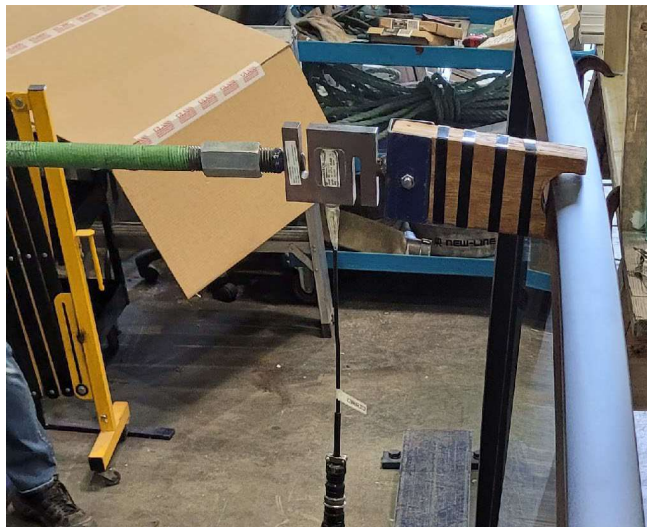


Figure 2. Horizontal – Mid-span of Top Rail Concentrated Load

TEST REPORT FOR VISTA RAILING SYSTEMS INC.

Report No.: 105224861COQ-002C

Date: 04/26/23



Figure 3. Horizontal – Top Rail Adjacent to Post Connection Concentrated Load



Figure 4. Horizontal – Top of Post Concentrated Load



Total Quality. Assured.

1500 Brigantine Drive
Coquitlam, BC, V3K 7C1

Telephone: 604-520-3321
Facsimile: 604-524-9186
www.intertek.com

TEST REPORT FOR VISTA RAILING SYSTEMS INC.

Report No.: 105224861COQ-002C

Date: 04/26/23

SECTION 12

APPENDIX C – DRAWINGS (6 PAGES)

TEST REPORT FOR VISTA RAILING SYSTEMS INC.

Report No.: 105224861COQ-002C

Date: 04/26/23

