VISTA RAILING SYSTEMS INC.
TEST REPORT

SCOPE OF WORK
REPORT OF 8 FT. PICKET RAILING SYSTEM (3 IN. OPENING) TESTED IN ACCORDANCE WITH ASTM E935-21, *STANDARD TEST METHODS FOR PERFORMANCE OF PERMANENT METAL RAILING SYSTEMS AND RAILS FOR BUILDINGS*

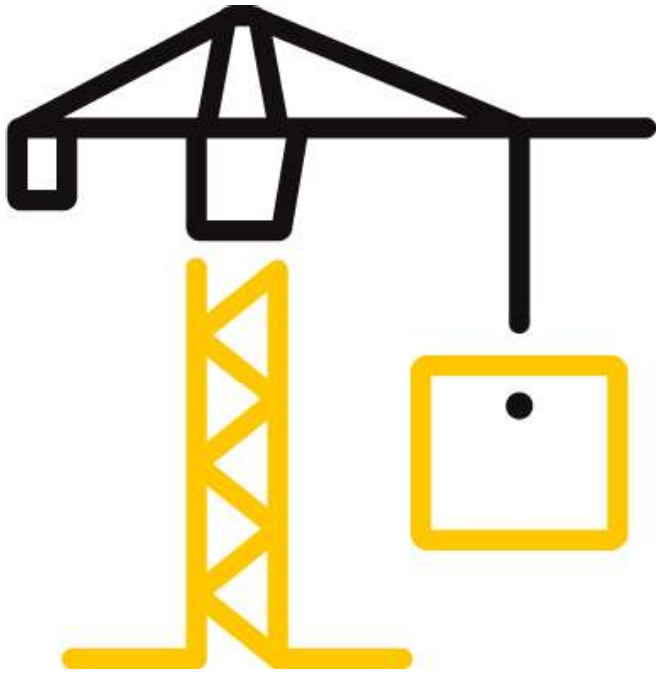
REPORT NUMBER
106319623COQ-001

TEST DATE
09/10/25

ISSUE DATE
09/25/25

PAGES
20

DOCUMENT CONTROL NUMBER
GFT-OP-10c (09/29/20)



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TEST REPORT FOR VISTA RAILING SYSTEMS INC.
Report No.: 106319623COQ-001
Date: 09/25/25

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., Maple Ridge, BC, V2W 1B6, Canada, to perform testing on the 8 ft. Picket Railing System (3 in. Opening) 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 9.8.8.2 of the 2020 NBC, 2024 OBC, 2024 BCBC, and 2023 NBC-AE. Results obtained are tested values. Testing was conducted at the Intertek test facility in Coquitlam, BC, Canada on September 10, 2025.

Unless differently required, Intertek reports apply the "Simple Acceptance" rule also called “Shared Risk approach,” of ILAC-G8:09/2019, Guidelines on Decision Rules and Statements of Conformity.

For INTERTEK B&C:

COMPLETED BY:	Chris Chang, P.Eng.	**REVIEWED BY:**	Baldeep Sandhu
TITLE:	Sr. Tech – Building & Construction	**TITLE:**	Manager – Building & Construction
SIGNATURE:	 EGBC Permit No.: 1000953	**SIGNATURE:**	
DATE:	09/25/25	**DATE:**	09/25/25

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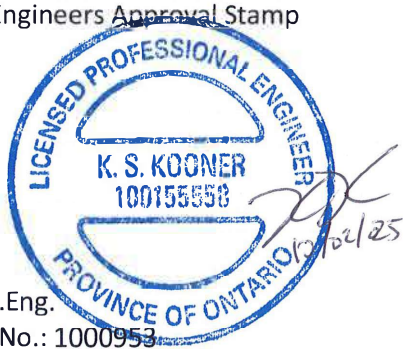
Engineer's Disclaimer:

- Intertek Engineers do not assume professional responsibility of Engineer of Record.
- Compliance to Building Codes must be approved by the Engineer of Record or Authority Having Jurisdiction.
- Intertek Engineer's seal and signature is limited to the review of applicable code required loads, review of test setup, and witnessing of laboratory testing.
- Additional disclaimers are shown in Notes of Section 7 and Section 8

Engineers Approval Stamp



Kal Kooner, P.Eng.
EGBC Permit No.: 1000953
Director, Building & Construction
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Dan Lungu, P.Eng.
EGBC Permit No.: 1000953
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TEST REPORT FOR VISTA RAILING SYSTEMS INC.
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SECTION 2
SUMMARY OF TEST RESULTS

SYSTEM DESCRIPTION	TEST	PASS/FAIL
8 ft. Picket Railing System (3 in. Opening)	In-fill Load	Pass
	Vertical Uniform Load Test	Pass
	Horizontal Uniform Load Test	Pass
	Horizontal – Mid-Span Concentrated Load	Pass
	Horizontal – Adjacent to Post Concentrated Load	Pass
	Horizontal – Top of Post Concentrated Load	Pass
	Size of Opening	Pass

Refer to Appendix B for photos of testing.

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SECTION 3
TEST LOADS

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:

2020 National Building Code of Canada (NBC)

- Section 9.8.8.2 *Loads on Guards*

2024 Ontario Building Code (OBC)

- Section 9.8.8.2 *Loads on Guards*

2024 British Columbia Building Code (BCBC)

- Section 9.8.8.2 *Loads on Guards*

2023 National Building Code – Alberta Edition (NBC-AE)

- Section 9.8.8.2 *Loads on Guards*

SECTION 4
MATERIAL SOURCE

The client submitted the railing system to the Evaluation Center on September 3, 2025 (Coquitlam ID# VAN2509030850-001). The sample was received in good condition and was suitable for testing unless noted otherwise. The sample was not independently selected for testing.

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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	01/02/26
P60688	Artech 1k lb S-Type Load Cell	20210-1K	01/02/26
P60610	T&D Temperature and Humidity Logger	TR-72Ui	11/02/25
P60623	Extech Stopwatch	365515	11/19/25
P60494	Stanley Tape Measure	FatMax	12/03/25
P51566	Mitutoyo 6 in. Digital Caliper	CD-6	01/06/26
D7810	Micro Mule	Intertek-York	11/05/25
D7817	Tyco Electronics Linear Transducer	PT1MA-20-UP-420E-M6	02/07/26

SECTION 6
LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Kevin Penner	Intertek B&C
Stanley Miguel	Intertek B&C
Chris Chang	Intertek B&C
Kal Kooner	Intertek B&C
Dan Lungu	Intertek B&C

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. For each test, deflection measurements were taken at the point of load application. Testing was conducted with reference to the specified load requirements of the following:

2020 NBC / 2024 OBC / 2024 BCBC / 2023 NBC-AE:
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

2) Individual elements within the *guard*, including solid panels and pickets, shall be designed for a concentrated load of 0.5 kN applied over an area of 300 mm x 300 mm located at any point in the element or elements so as to engage 3 balusters when possible.

3) The minimum specified load applied vertically at the top of every required *guard* shall be 1.5 kN/m.

4) None of the loads specified above need be considered to act simultaneously.

Note 1: A safety factor of 1.67-2.5 was applied to the above loads, based on an assumed failure mode and tested material. The safety factor was calculated by dividing the live load factor of 1.5 by the material resistance factors below, as defined in the CAN/CSA S157, *Strength Design in Aluminum* standard.

- ø=0.90 resistance factor for bending failure mode, resulting safety factor = 1.67
- ø=0.75 resistance factor for ductile failure mode, resulting safety factor = 2.0
- ø=0.67 resistance factor for brittle failure mode, resulting safety factor = 2.24
- ø=0.60 resistance factor for wood fastener connections, resulting safety factor = 2.5

IN-FILL LOAD TEST

A test load was applied using a 300 mm x 300 mm square block on the center of the railing system normal to the in-fill. After release of the load, the system was evaluated for failure, any evidence of disengagements of any component and visible cracks in any component.

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UNIFORM LOAD TEST

Uniform test loads were applied vertically to the top of the guardrail system and horizontally to the top of the guardrail system. The test loads were 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

Concentrated test loads were applied horizontally at the midspan of the top of the guard, at the top rail adjacent to the post connection to verify the connection capacity, and at the top of post. After completion of the above load tests, the concentrated load at the top of post was loaded until failure.

SIZE OF OPENING

The opening between adjacent vertical elements was subjected to a specified live load of 0.1 kN applied in opposite directions and measured. At the applied load, the size of opening was measured with a caliper.

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.	39.7 in.	0.10 in.	6005 Aluminum
Baseplate	2	4.00 in.	4.00 in.	0.31 in.	-	6061 Aluminum
Top Rail	1	96.0 in.	2.31 in.	2.52 in.	0.08 in.	6063 Aluminum
Bottom Rail	1	96.0 in.	0.87 in.	1.53 in.	0.05 in.	6063 Aluminum
Support Leg	2	1.64 in.	1.00 in.	2.63 in.	0.14 in.	6063 Aluminum
Infill - Picket	26	0.63 in.	0.63 in.	37.4 in.	0.05 in.	6063 Aluminum

Note 2: The railing had two (2) support legs positioned under the bottom rail spaced 32 in. from each end and were set on a steel test frame. For detailed drawings of the test samples and components, refer to Appendix C.

Note 3: 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 assembly was 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 the 8 Picket Railing System (3 in. Opening) 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:

2020 National Building Code of Canada (NBC)
- Section 9.8.8.2 *Loads on Guards*

2024 Ontario Building Code (OBC)
- Section 9.8.8.2 *Loads on Guards*

2024 British Columbia Building Code (BCBC)
- Section 9.8.8.2 *Loads on Guards*

2023 National Building Code – Alberta Edition (NBC-AE)
- Section 9.8.8.2 *Loads on Guards*

The Vista Railing Systems Inc. 8 ft. Picket Railing System (3 in. Opening) identified and evaluated in this report has met the load requirements using the safety factors as defined in Section 7, Note 1 of this report. 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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TEST REPORT FOR VISTA RAILING SYSTEMS INC.
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SECTION 11

APPENDIX A – TEST DATA (2 PAGES)

Company	Vista Railing Systems Inc.	Technician(s)	Kevin Penner, Stanley Miguel
Project No.	G106319623	Reviewer	Baldeep Sandhu
Models	8 ft. Picket Railing System (3 in. Opening)	Start/End Date	September 10, 2025
Product Name	Same as above	Sample ID	VAN2509030850-001
Standard	**2020 NBC/2024 BCBC/2024 OBC/2023 NBC-AE, Section 9.8.8.2**		

Test Data Package

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Test:	**Loads on Guards - Section 9.8.8.2**				Project:	G106319623
Date:	10-Sep-25				Eng/Tech:	Kevin Penner / Stanley Miguel
Client:	Vista Railing Systems Inc.				Reviewer:	Baldeep Sandhu
Product:	**8 ft. Picket Aluminum Railing System - Surface Mount (3 in. Opening)**				Location:	Coquitlam, BC, Canada
Post Spacing:	8.17 ft	2.49 m				
Height of Guard:	42.1 in	1070 mm				
Opening in Guard:	3.0 in	76 mm	(between pickets)			
	2.50 in	64 mm	(under bottom rail)			

Method: ASTM E935-21, *Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings*
2020 National Building Code of Canada, Section 9.8.8.2 *Loads on Guards*
2024 Ontario Building Code, Section 9.8.8.2 *Loads on Guards*
2024 British Columbia Building Code, Section 9.8.8.2 *Loads on Guards*
2023 National Building Code - Alberta Edition, Section 9.8.8.2 *Loads on Guards*

Safety Factor: 1.67 (based on a resistance factor Ø = 0.9 for aluminum)
2.24 (based on a resistance factor Ø = 0.67 for connection)

Equipment: Artech 5000 lbf Load Cell (Intertek ID# P60692, cal due January 2, 2026)
Artech 1000 lbf Load Cell (Intertek ID# P60688, cal due January 2, 2026)
T&D TR-72Ui Temperature and Humidity Logger (Intertek ID# P60610, cal due November 2, 2025)
Stopwatch (Intertek ID# P60623, cal due November 19, 2025)
Stanley Tape Measure (Intertek ID# P60494, cal due December 3, 2025)
Mitutoyo Digital Caliper (Intertek ID# P51566, cal due January 6, 2026)
Micro Mule Measurement System (Intertek ID# D7810, cal due November 5, 2025)
Tyco Electronics Linear Transducer (Intertek ID# D7817, cal due February 7, 2026)

Time/Temp/RH: 1:30PM / 24.0°C / 51.0%

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 12 in. x 12 in.)	112	187	-	-	187	1.572	**Pass**
	Vertical Uniform Load (per ft)	103	171	1428	699	1399	0.181	**Pass**
	Horizontal Uniform Load (per ft)	34	57	476	233	466	3.318	**Pass**
	Midspan Horizontal Concentrated Load	225	375	-	-	375	3.080	**Pass**
	Adjacent to Post Concentrated Load	225	503	-	-	503	4.707	**Pass**
	Top of Post Concentrated Load	225	375	-	-	375	3.681	**Pass**
	Top of Post Concentrated Load Ultimate Load	596.5 lbs ultimate failure; post to baseplate connection broke						
In-plane	Size of Opening	22.5	-	-	-	22.5	3.813	**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 300 mm in. x 300 mm)	0.5	0.83	-	-	0.83	39.9	**Pass**
	Vertical Uniform Load (per m)	1.5	2.50	1.94	3.11	6.22	4.6	**Pass**
	Horizontal Uniform Load (per m)	0.5	0.83	0.65	1.04	2.07	84.3	**Pass**
	Midspan Horizontal Concentrated Load	1	1.67	-	-	1.67	78.2	**Pass**
	Adjacent to Post Concentrated Load	1	2.24	-	-	2.24	119.6	**Pass**
	Top of Post Concentrated Load	1	1.67	-	-	1.67	93.5	**Pass**
	Top of Post Concentrated Load Ultimate Load	2.65 kN ultimate failure; post to baseplate connection broke						
In-plane	Size of Opening	0.1	-	-	-	0.10	96.9	**Pass**

ULTIMATE LOAD: 596.5 lbs (2.65 kN)

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APPENDIX B – PHOTOS (2 PAGES)

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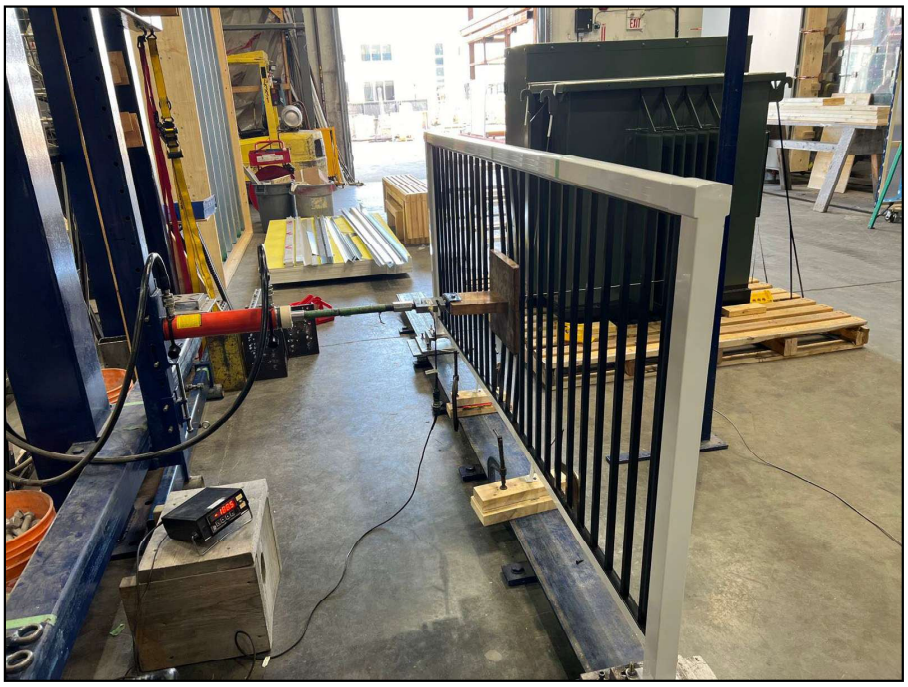

Figure 1 – In-fill Load Test

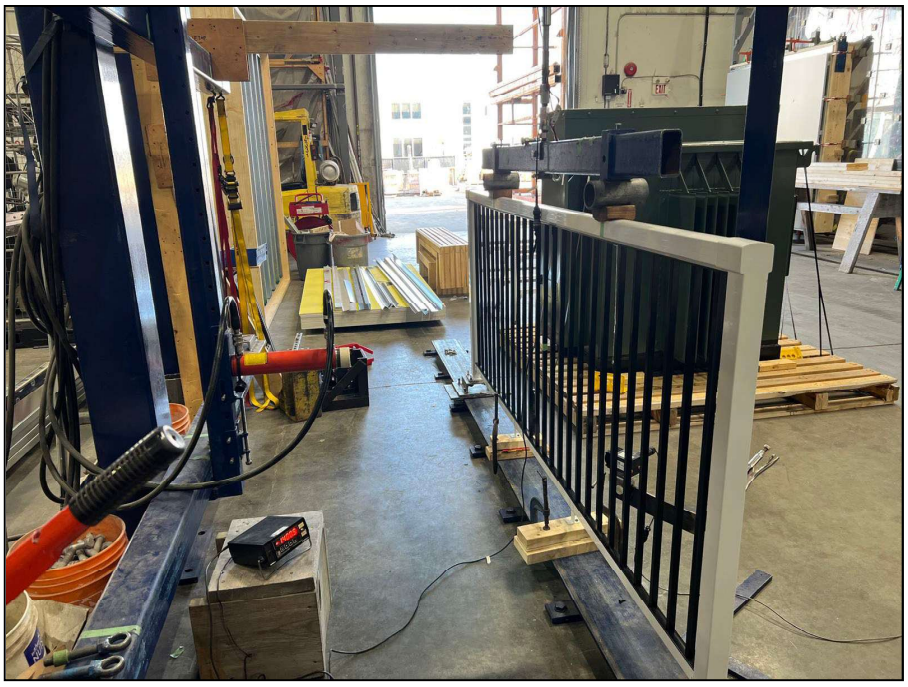

Figure 2 – Vertical Uniform Load Test

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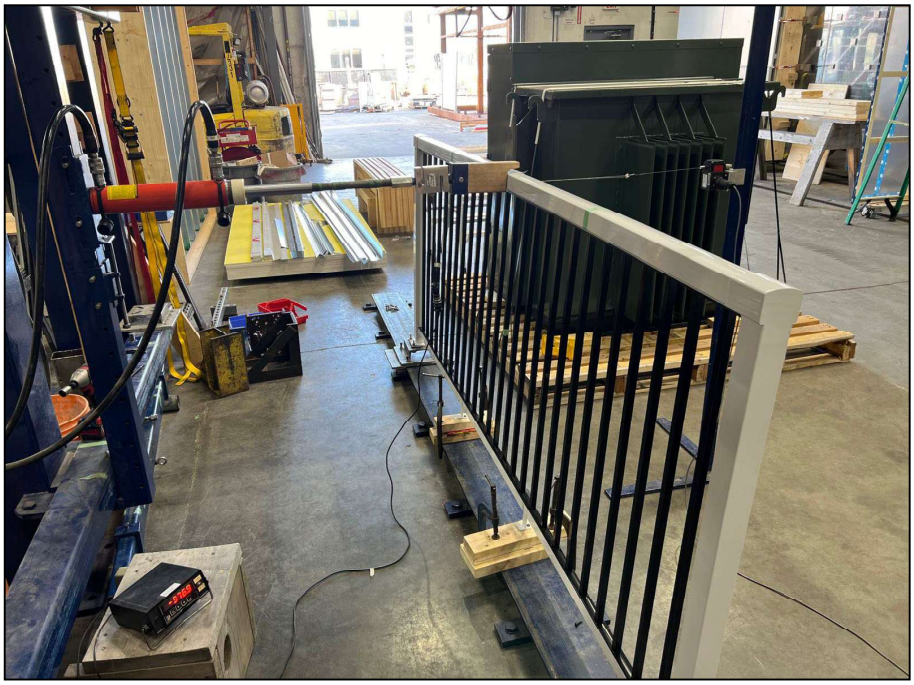

Figure 3 – Mid-span of Top Rail Concentrated Load Test

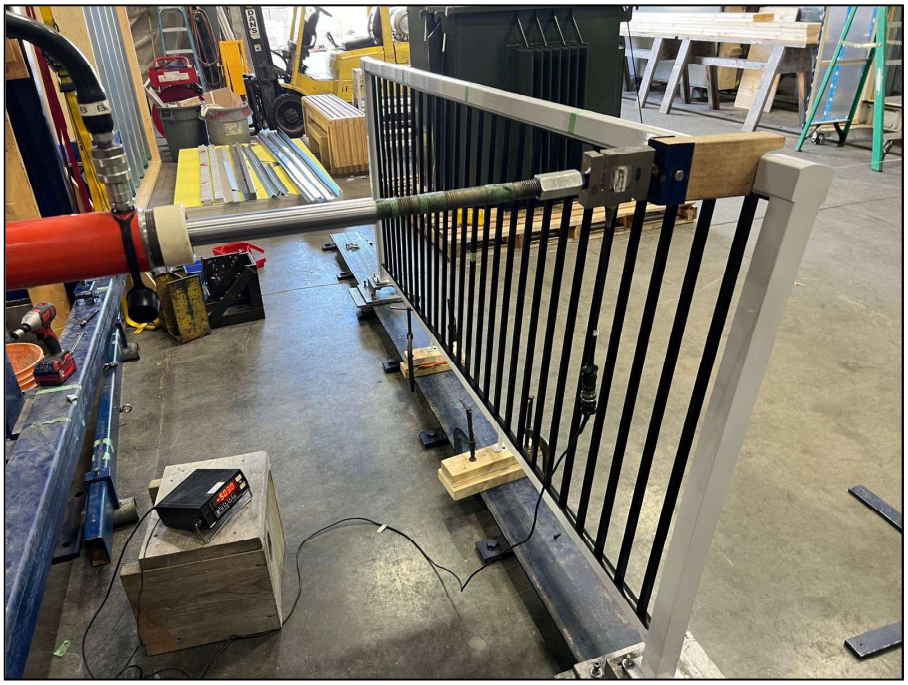

Figure 4 – Adjacent to Post Connection Concentrated Load Test

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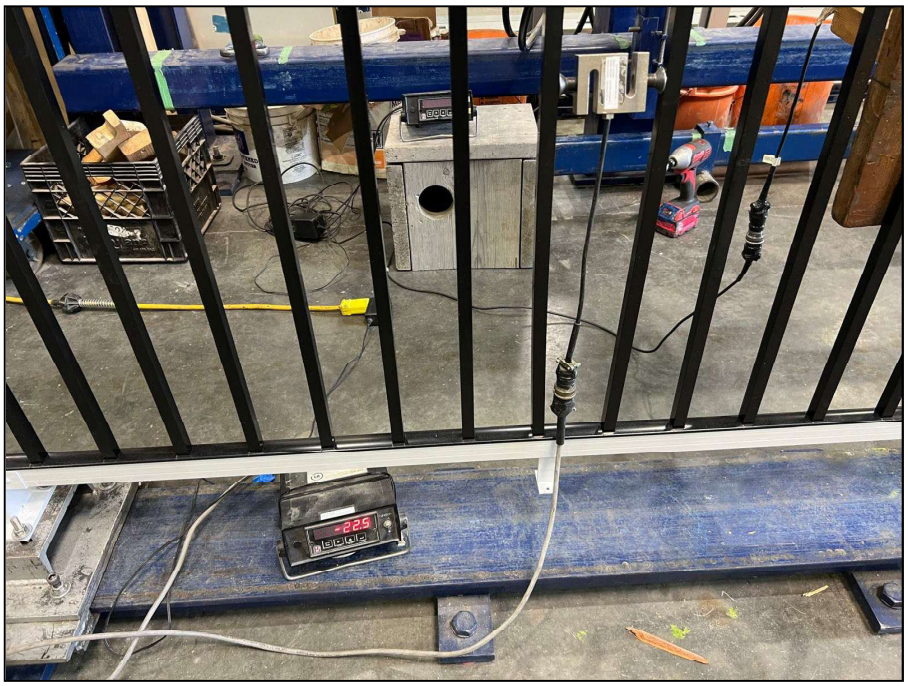

Figure 5 – Size of Opening Test

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SECTION 12

REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	09/25/25	N/A	Original Report Issue