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CENDEK RAILINGS LTD.
TEST REPORT

SCOPE OF WORK
REPORT OF 4 FT. PRIVACY WALLS TESTED IN ACCORDANCE WITH ASTM E935-21, *STANDARD TEST METHODS FOR PERFORMANCE OF PERMANENT METAL RAILING SYSTEMS AND RAILS FOR BUILDINGS*

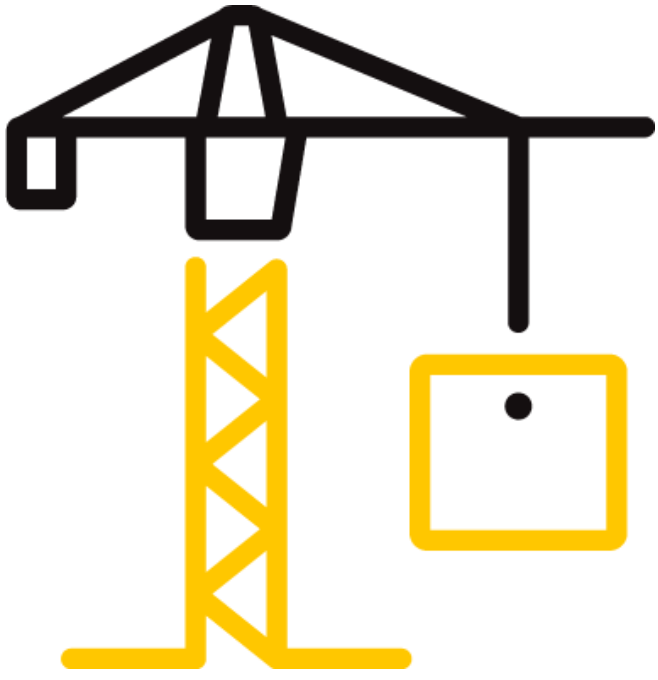
REPORT NUMBER
105626012COQ-001

TEST DATES
12/06/23

ISSUE DATE
12/14/23

PAGES
26

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



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TEST REPORT FOR CENDEK RAILINGS LTD.
Report No.: 105626012COQ-001
Date: 12/14/23

REPORT ISSUED TO
CENDEK RAILINGS LTD.
9685 Agur St.
Summerland, BC, V0H 1Z2
Canada

SECTION 1
SCOPE

Intertek Building & Construction (B&C) was contracted by Cendek Railings Ltd., 9685 Agur St., Summerland, BC, V0H 1Z2, Canada to perform testing on their Privacy Wall products 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 Cendek Railings Ltd. 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. 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 December 6, 2023.

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:	12/14/23	**DATE:**	12/14/23

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SECTION 2
SUMMARY OF TEST RESULTS

SYSTEM DESCRIPTION	TEST	PASS/FAIL
Privacy Wall – Deck Mount (4 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
Privacy Wall – Fascia Mount (4 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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Date: 12/14/23

SECTION 3
TEST METHOD

The guard specimens were 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 systems to the Evaluation Center on November 14, 2023 (Coquitlam ID# VAN2311141104-001). The samples were received in good condition and were suitable for testing unless noted otherwise. The samples were 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	12/12/23
P60554	T&D Temperature and Humidity Indicator	TR-72Ui	10/16/24
P60624	Extech Stopwatch	365515	12/07/23
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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Report No.: 105626012COQ-001
Date: 12/14/23

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 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 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. An individual Privacy Board at 42 in. height 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. An individual Privacy Board at 42 in. height was subjected to three (3) separate horizontal tests where a concentrated load of 500 lbs was applied:

- horizontally at the mid-span of the Privacy Board,
- horizontally at the Privacy Board adjacent to the post connection to verify the connection capacity, and
- horizontally on the post at 42 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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Date: 12/14/23

SECTION 8
TEST SPECIMEN DESCRIPTION

The samples were identified as the following:

TABLE 1. RAILING CONFIGURATION							
PART NAME	PART NUMBER	QTY	PART DIMENSIONS				REPORTED MATERIAL
			LENGTH	WIDTH	HEIGHT	NOMINAL THICKNESS	
4 FT. PRIVACY WALL – DECK MOUNT							
Post	N/A	2	2.53 in.	2.53 in.	71.3 in.	0.09 in.	Aluminum
Baseplate	D000063	2	4.00 in.	4.00 in.	0.25 in.	N/A	Aluminum
Infill – Privacy Board	N/A	12	5.38 in.	46.5 in.	0.63 in.	0.08 in.	Aluminum
4 FT. PRIVACY WALL – FASCIA MOUNT							
Post	N/A	2	2.53 in.	2.53 in.	79.0 in.	0.09 in.	Aluminum
Scenic Fascia Bracket	D000844	2	4.75 in.	4.50 in.	4.00 in.	0.31 in.	Aluminum
Infill – Privacy Board	N/A	12	5.38 in.	46.5 in.	0.63 in.	0.08 in.	Aluminum

Note 1: 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 Cendek Railings Ltd. on the Privacy Wall products 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 Cendek Railings Ltd. 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*

2021 International Residential Code (IRC)

- R301.5 *Live Load*

The Cendek Railings Ltd. Privacy Wall products identified and evaluated in this report have 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 (3 PAGES)

Company	Cendek Railings Ltd.	Technician(s)	Jason Komorski
Project No.	G105616012	Reviewer	Baldeep Sandhu
Models	4 ft. o/c	Start/End Date	December 6, 2023
Product Name	Privacy Walls	Sample ID	VAN2311141104-001
Standard	**2021 IBC/IRC**		

Test Data Package

Table of Contents

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Test:	**Loads on Guards**				Project:	G105626012
Date:	6-Dec-23				Eng/Tech:	Jason Komorski
Client:	Cendek Railings Ltd.					Baldeep Sandhu
Product:	**Privacy Screen - Deck Mount**				Reviewer:	Coquitlam, BC, Canada
Post Spacing:	4.00 ft	1.22 m				
Height of Guard:	42.1 in	1070 mm				
Opening in Guard:	0.38 in	10 mm	(between slats)			
	2.38 in	60 mm	(under bottom rail)			

Method: ASTM E2353-16, *Standard Test Methods for Performance of Glazing in Permanent Railing Systems, Guards, and Balustrades*
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 December 12, 2023)
T&D TR-72Ui Temperature and Humidity Logger (Intertek ID# P60554, cal due October 16, 2024)
Stopwatch (Intertek ID# P60624, cal due December 7, 2023)
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: 8:30AM / 23.0°C / 50%

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	250	250	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	0.56	-	-	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	0.34	1.11	2.23	**Pass**

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Test:	**Loads on Guards**				Project:	G105626012
Date:	6-Dec-23				Eng/Tech:	Jason Komorski
Client:	Cendek Railings Ltd.					Baldeep Sandhu
Product:	**Privacy Screen - Fascia Mount**				Reviewer:	Coquitlam, BC, Canada
Post Spacing:	4.00 ft	1.22 m				
Height of Guard:	42.1 in	1070 mm				
Opening in Guard:	0.38 in	10 mm	(between slats)			
	2.38 in	60 mm	(under bottom rail)			

Method: ASTM E2353-16, *Standard Test Methods for Performance of Glazing in Permanent Railing Systems, Guards, and Balustrades*
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 December 12, 2023)
T&D TR-72Ui Temperature and Humidity Logger (Intertek ID# P60554, cal due October 16, 2024)
Stopwatch (Intertek ID# P60624, cal due December 7, 2023)
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: 12:30PM / 22.8°C / 51%

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	250	250	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	0.56	-	-	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	0.34	1.11	2.23	**Pass**

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SECTION 11
APPENDIX B – PHOTOS (4 PAGES)

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Figure 1. Privacy Wall (Deck Mount) – In-fill Load Test

Figure 2. Privacy Wall (Deck Mount) – Horizontal – Mid-Span of Privacy Board Concentrated Load

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Figure 3. Privacy Wall (Deck Mount) – Horizontal – Adjacent to Post Concentrated Load

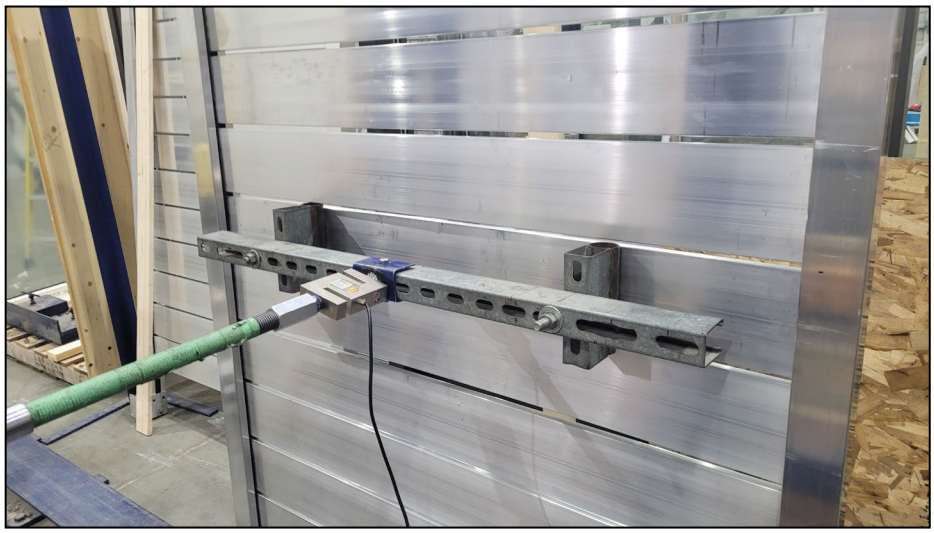

Figure 4. Privacy Wall (Deck Mount) – Uniform Load

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Figure 5. Privacy Wall (Fascia Mount) – In-fill Load Test

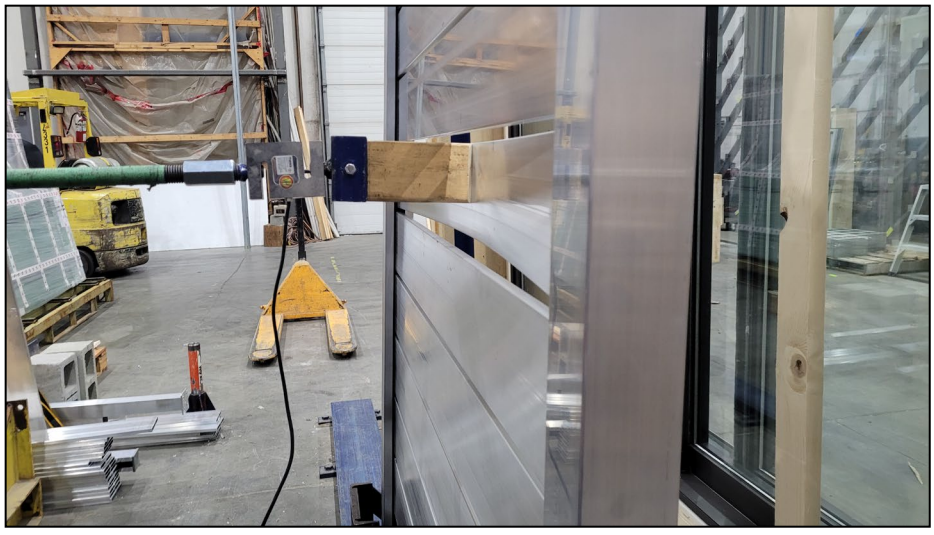

Figure 6. Privacy Wall (Fascia Mount) – Horizontal – Mid-Span of Privacy Board Concentrated Load

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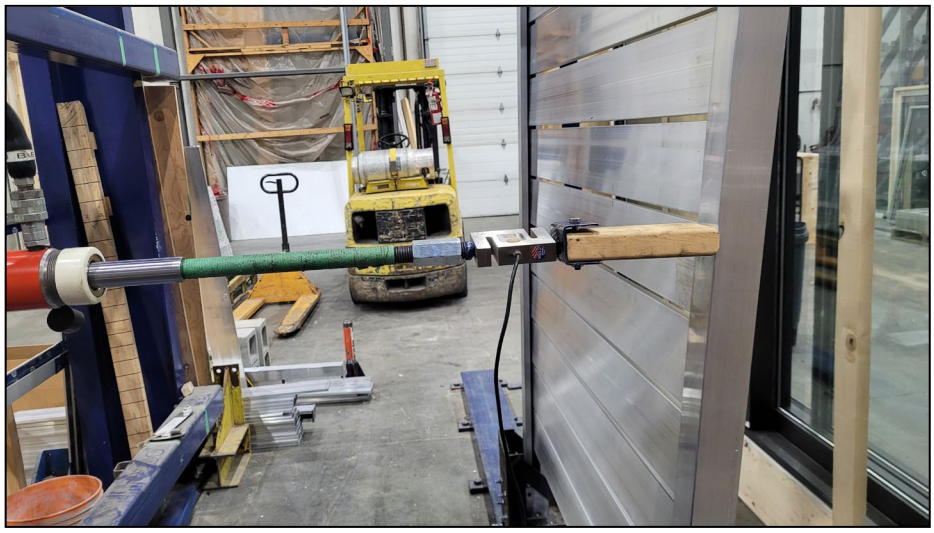

Figure 7. Privacy Wall (Fascia Mount) – Horizontal – Post Concentrated Load

Figure 8. Privacy Wall (Fascia Mount) – Uniform Load

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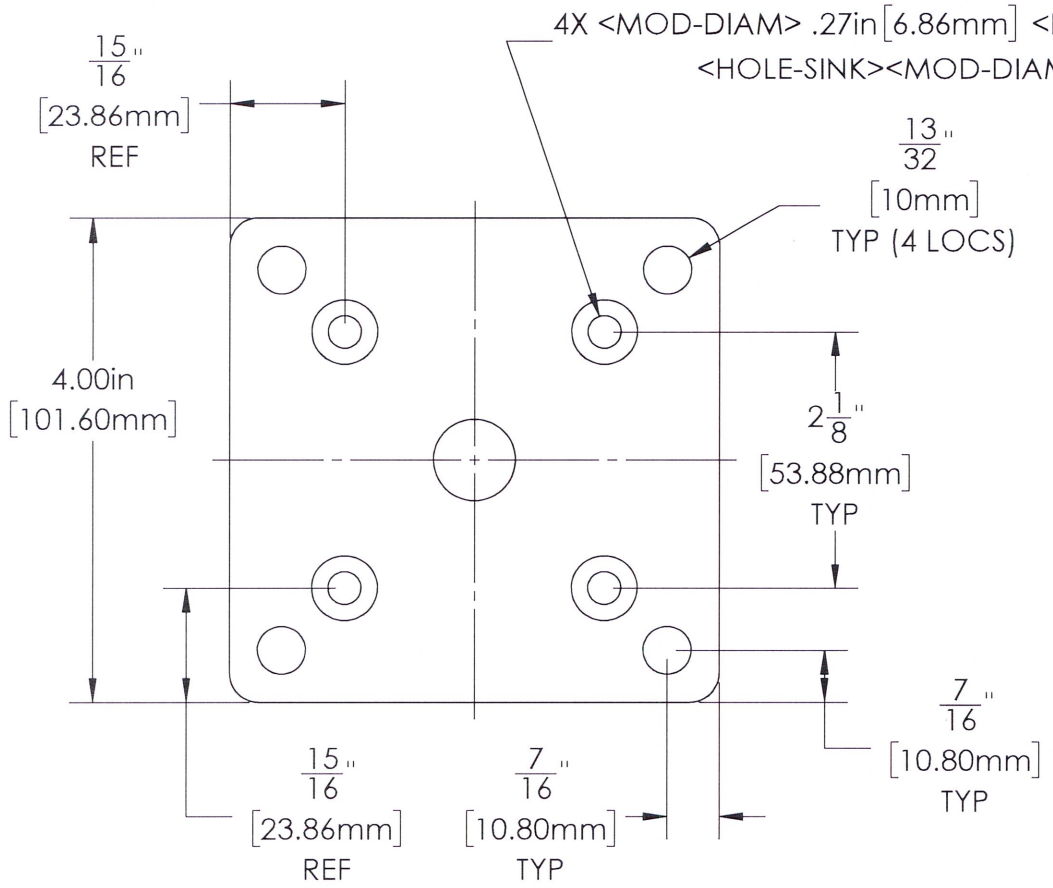
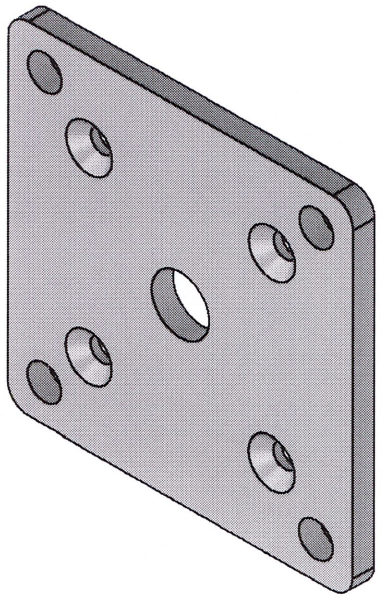
SECTION 12

APPENDIX C – DRAWINGS (6 PAGES)





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Test sample complies with these details. Deviations are noted.

Report #: 105626012COQ-001

Date: 12/14/23 Tech: C.C.

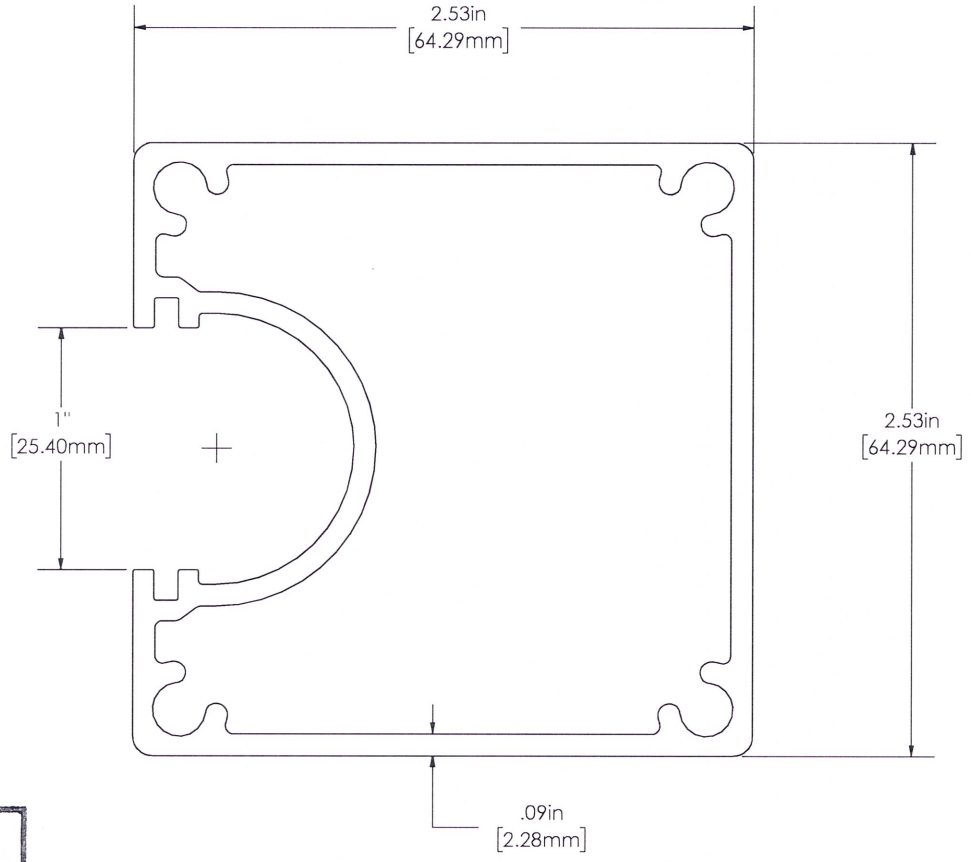
CenDek Railings Ltd.

DRAWN BY	Admin
CREATED	9/6/2017
MATERIAL	6005A - T6
DIE NO.	DYG10072635

ALL DIMENSION IN INCHES/mm

DESCRIPTION
Baseplate 4"x 4" 2-1/2" Post

Part No. D000063	Eng No. 0054PB	
Weight 0.36 lbs	SHEET 4 OF 4	Rev -



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Test sample complies with these details.
Deviations are noted.

Report #: 105626012COQ-001

Date: 12/14/23 Tech: C. C.

REVISIONS			
REV.	DESCRIPTION	DATE	INITIAL

CenDek Railings Ltd.

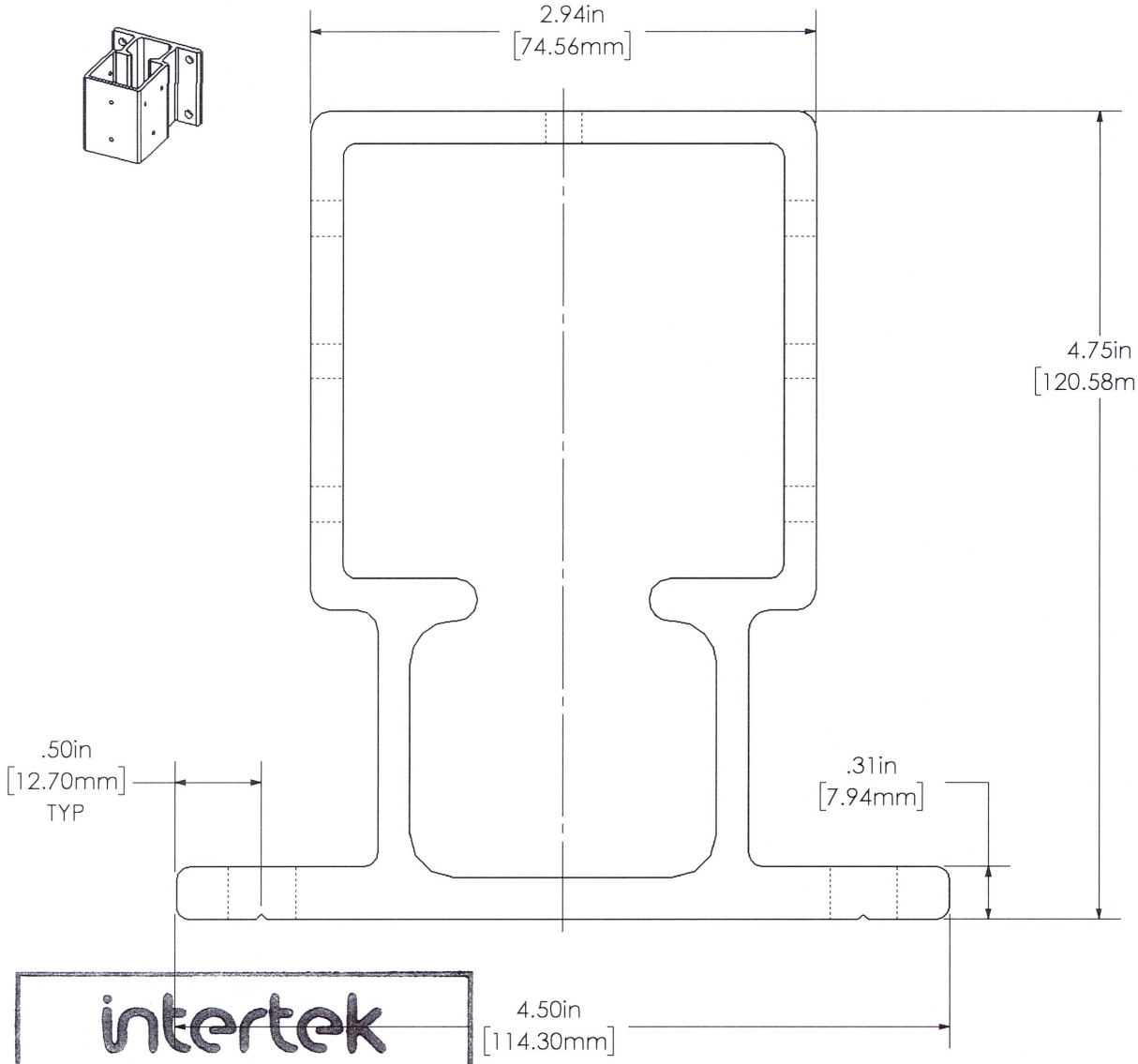
DRAWN BY	Admin
CREATED	9/19/2017
MATERIAL	6063-T5
DIE NO.	

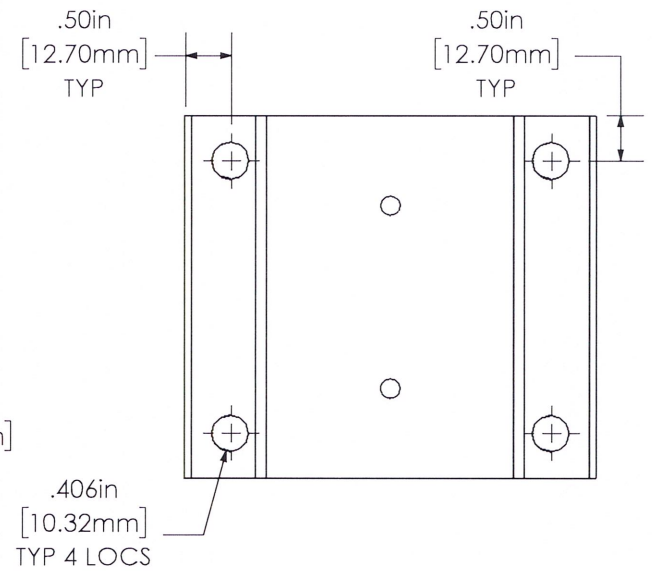
ALL DIMENSION IN INCHES/mm

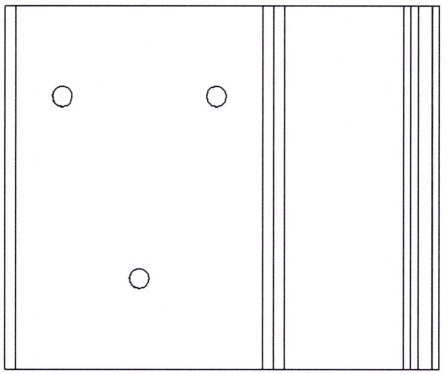
DESCRIPTION

2-1/2" Scenic End Post Drawing

Part No. NA	Eng No. 0069PJ	
Weight 1.29 Lbs		Rev -







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Test sample complies with these details.
Deviations are noted.

Report #: 105626012COQ-001

Date: 12/14/23 Tech: C. C.

REVISIONS			
REV.	DESCRIPTION	DATE	INTIALS

CenDek Railings Ltd.

DRAWN BY	Admin
CREATED	10/4/2018
MATERIAL	6063-T5
DIE NO.	696013

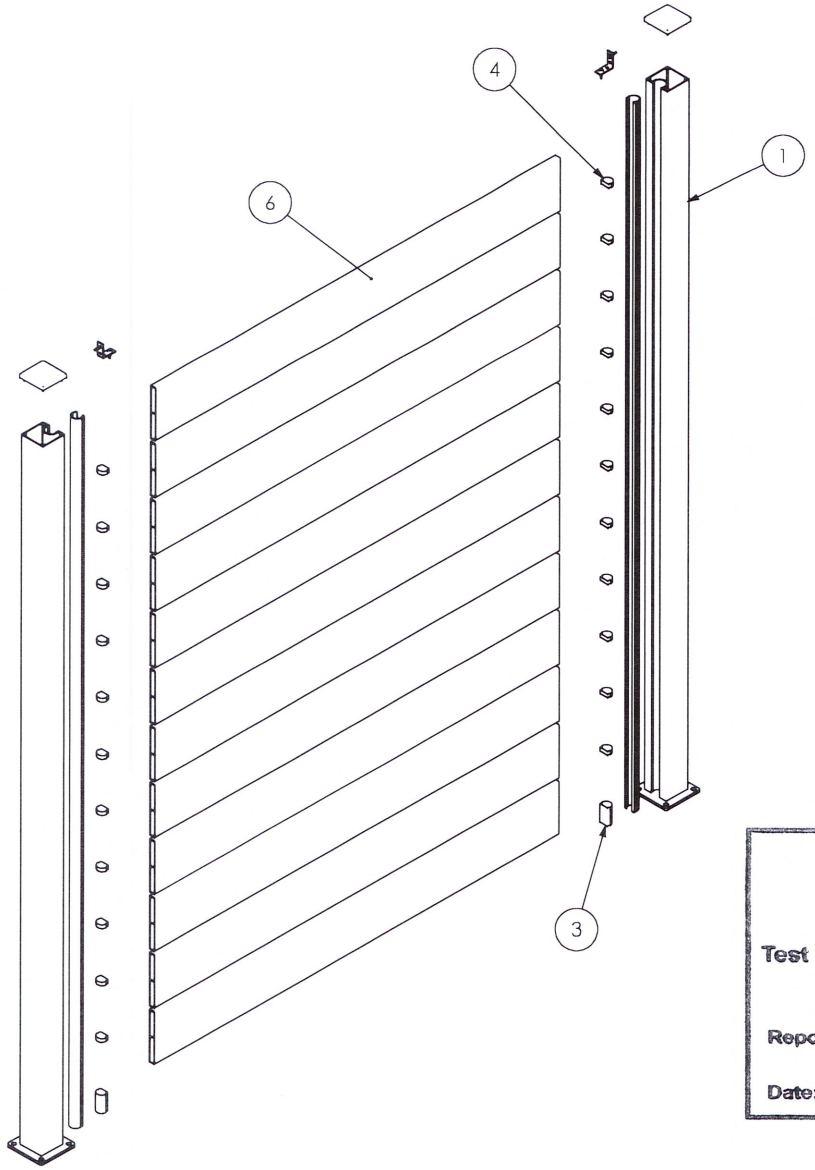
ALL DIMENSION IN INCHES/mm

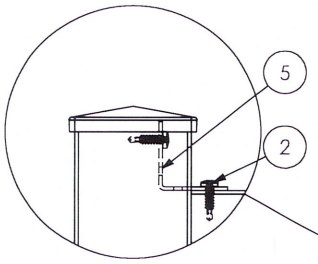
DESCRIPTION

Scenic Fascia Bracket
Line/End/Stair

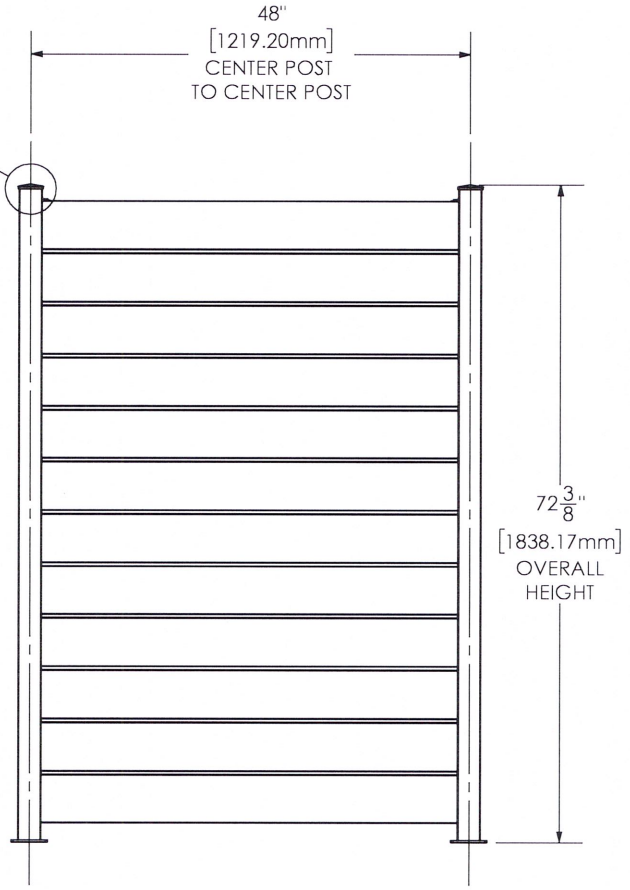
Part No. D000844	Eng No.	
Weight 1.47 Lbs		Rev -

ITEM NO.	Eng No.	DESCRIPTION	QTY.
1	2320AA	72in Privacy Surface End Post	2
2	0096PA	Screw #10x3/4" PH Robertson TEK Zinc	4
3	0495PA	Rubber Scenic Post Glass Setting Block 1-7/8"	2
4	0495PB	Rubber Scenic post glass setting block 3/8"	22
5	2318P	L-Bracket 1-1/2 x1-1/2 x 1/16 Black	2
6	2677PA	5/8" X 5-3/8" X 46-5/8" Privacy Board	12





DETAIL F
FASTEN BOTH SIDES OF THE TOP BOARD TO POST WITH L-BRACKET
SCALE 1 : 4



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Test sample complies with these details.
Deviations are noted.

Report #: 105626012COQ-001

Date: 12/14/23 Tech: C.C.

CenDek Railings Ltd.

DRAWN BY	Admin
CREATED	12/12/2023
MATERIAL	
DIE NO.	

ALL DIMENSION IN INCHES/mm

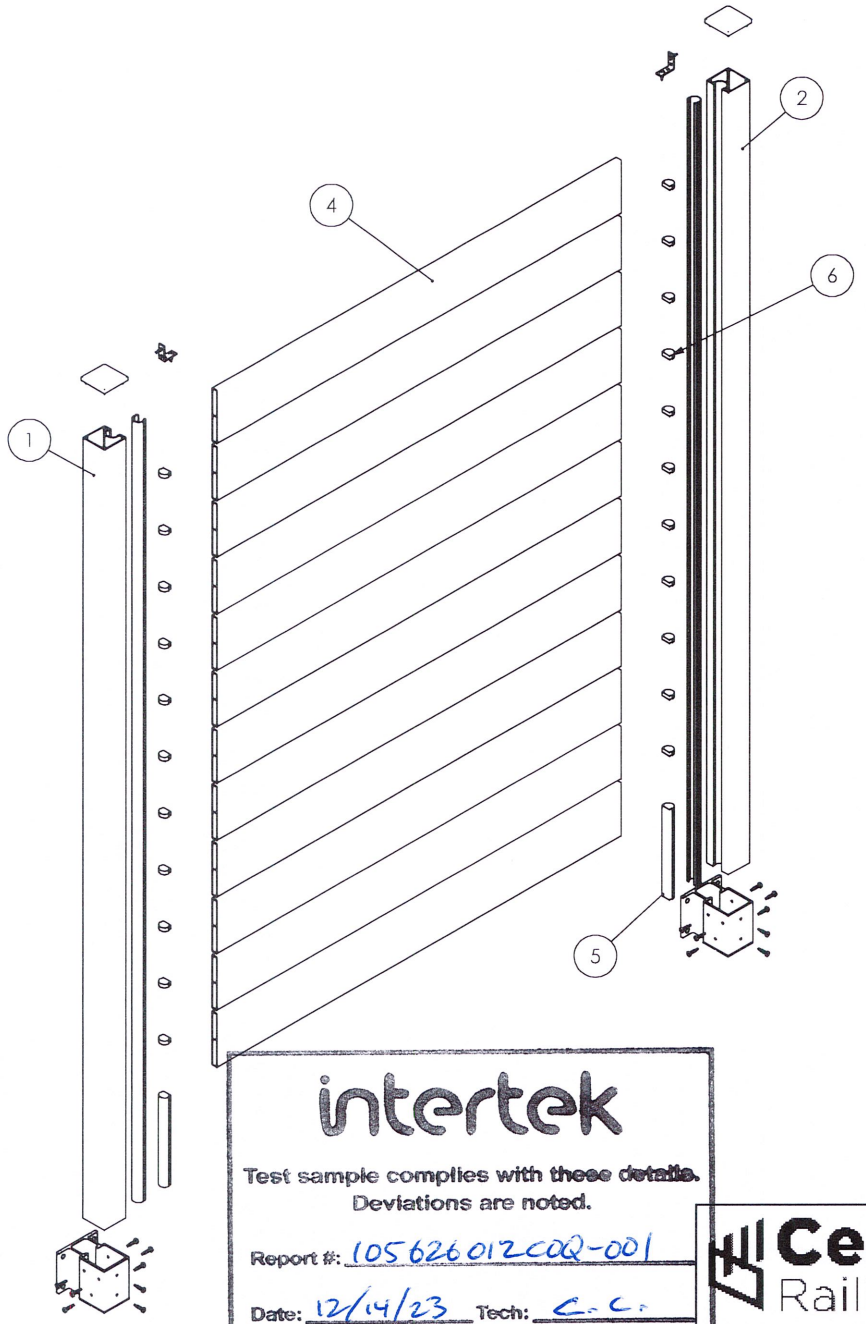
DESCRIPTION
4ft Privacy Wall - Surface Mount

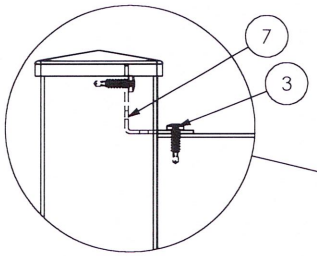
Part No. NA | Eng No. 2338AC
Weight 82.93 Lbs | SHEET 1 OF 1 | Rev -

REVISIONS

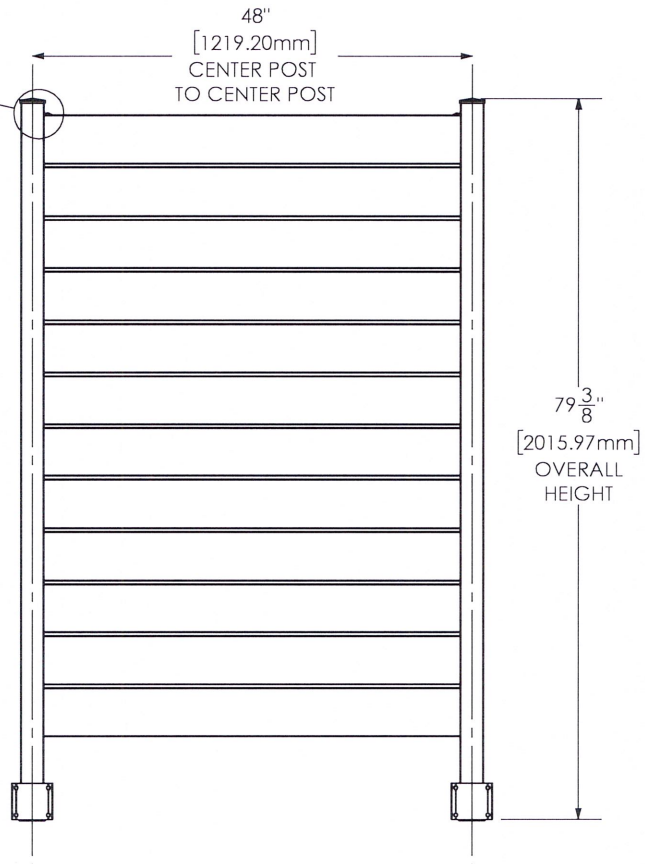
REV.	DESCRIPTION	DATE	INTIALS

ITEM NO.	Eng No.	DESCRIPTION	QTY.
1	2320AD	79in Privacy Fascia End Post-Left	1
2	2320AD	79in Privacy Fascia End Post - Right	1
3	0096PA	Screw #10x3/4" PH Robertson TEK Zinc	4
4	2677PA	5/8" X 5-3/8" X 46-5/8" Privacy Board	12
5	0495P	Rubber Scenic Post Glass Setting Block 9-1/8"	2
6	0495PB	Rubber Scenic post glass setting block 3/8"	22
7	2318P	L-Bracket 1-1/2 x1-1/2 x 1/16 Black	2





DETAIL F
FASTEN BOTH SIDES OF THE TOP BOARD TO POST WITH L-BRACKET
SCALE 1 : 4



intertek

Test sample complies with these details.
Deviations are noted.

Report #: 105626012COQ-001

Date: 12/14/23 Tech: C. C.

CenDek Railings Ltd.

DRAWN BY	Admin
CREATED	12/12/2023
MATERIAL	
DIE NO.	

ALL DIMENSION IN INCHES/mm

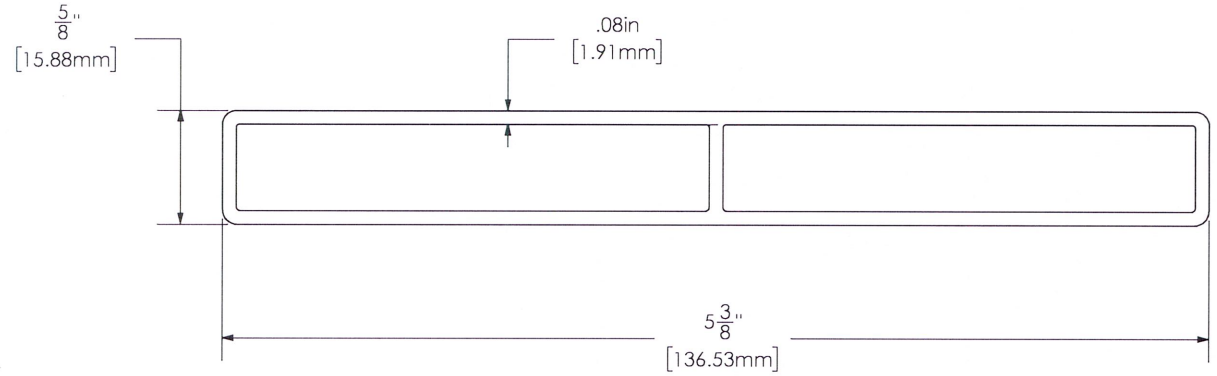
DESCRIPTION
4ft Privacy Wall - Fascia Mount

Part No. NA | Eng No. 2341AC

Weight 71.84 Lbs | SHEET 1 OF 1 | Rev -

REVISIONS

REV.	DESCRIPTION	DATE	INTIALS



intertek

Test sample complies with these details.
Deviations are noted.

Report #: 105626012COQ-001

Date: 12/14/23 Tech: C.C.

CenDek Railings Ltd.

DRAWN BY	Eng1
CREATED	1/13/2022
MATERIAL	6063-T5
DIE NO.	

ALL DIMENSION IN INCHES/mm

DESCRIPTION
5/8" X 5-3/8" X 70-5/8" Privacy Board

Part No.
Eng No. 2677PC
Weight 6.26 lbs
SHEET 1 OF 1
Rev -

1500 Brigantine Drive
Coquitlam, BC, V3K 7C1

Telephone: 604-520-3321
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SECTION 13

REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	12/14/23	N/A	Original Report Issue