

# CENDEK RAILINGS LTD.

## TEST REPORT

### SCOPE OF WORK

REPORT OF 8 FT. CENTURY ROUND COMPONENT PANEL – WB MOUNT RAILING SYSTEM  
TESTED IN ACCORDANCE WITH ASTM E935-E13E<sup>1</sup>, *STANDARD TEST METHODS FOR  
PERFORMANCE OF PERMANENT METAL RAILING SYSTEMS AND RAILS FOR BUILDINGS*

### REPORT NUMBER

104715588COQ-002E

### TEST DATES

07/19/21

### ISSUE DATE

08/16/21

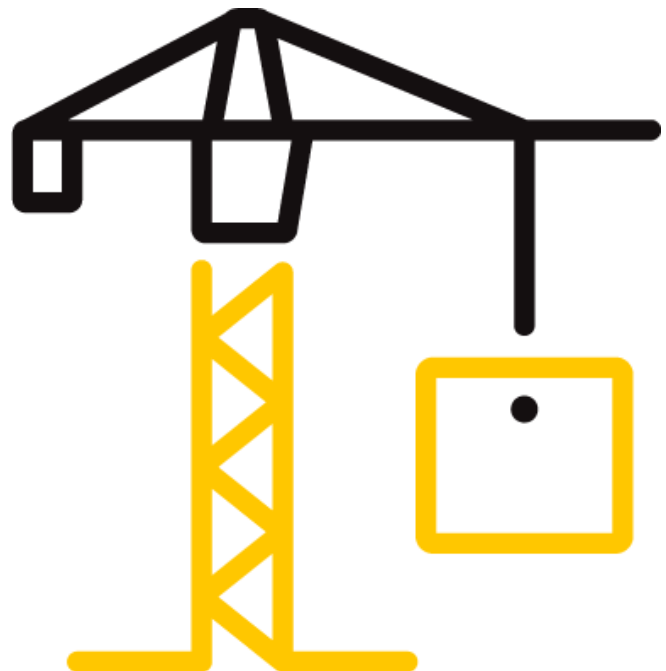
### PAGES

23

### DOCUMENT CONTROL NUMBER

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

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## TEST REPORT FOR CENDEK RAILINGS LTD.

Report No.: 104715588COQ-002E

Date: 08/16/21

### 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 the 8 ft. Century Round Component Panel – WB Mount Railing System in accordance with ASTM E935-13e<sup>1</sup>, *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 system to resist the load requirements of R301.5 of the 2018 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 July 19, 2021.

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

For INTERTEK B&C:

<b>COMPLETED</b>			
<b>BY:</b>	Chris Chang	<b>REVIEWED BY:</b>	Baldeep Sandhu
	Sr. Tech –		Manager –
<b>TITLE:</b>	Building & Construction	<b>TITLE:</b>	Building & Construction
			
<b>SIGNATURE:</b>		<b>SIGNATURE:</b>	
<b>DATE:</b>	08/16/21	<b>DATE:</b>	08/16/21

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## TEST REPORT FOR CENDEK RAILINGS LTD.

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### SECTION 2

#### SUMMARY OF TEST RESULTS

SYSTEM DESCRIPTION	TEST	PASS/FAIL
8 ft. Century Round	In-fill Load	Pass
Component Panel – WB	Horizontal – Mid-Span Concentrated Load	Pass
Mount	Horizontal – Adjacent to Post Concentrated Load	Pass

Refer to Appendix B for photos of testing.

## TEST REPORT FOR CENDEK RAILINGS LTD.

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### SECTION 3 TEST METHOD

The guard specimen was evaluated in accordance with the following:

**ASTM E935-13e1**, *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.

#### 2018 International Residential Code (IRC)

- R301.5 *Live Load*

### SECTION 4 MATERIAL SOURCE

The client submitted the railing system to the Evaluation Center on July 9, 2021 (Coquitlam ID# VAN2107090927-001). 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	10/22/21
P60554	T&D Temperature and Humidity Indicator	TR-72Ui	09/10/21
P60444	Extech Stopwatch	365515	03/05/22
52650	Mitutoyo 8 in. Digital Caliper	CD-8	06/08/22
P60494	Stanley Tape Measure	FatMax	09/08/21

## TEST REPORT FOR CENDEK RAILINGS LTD.

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### SECTION 6

#### LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Kevin Penner	Intertek B&C
Chris Chang	Intertek B&C

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

## TEST REPORT FOR CENDEK RAILINGS LTD.

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### SECTION 7

#### TESTING PROCEDURE

The evaluation was conducted in accordance with the testing procedures of ASTM E935-13e<sup>1</sup>, *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 Table R301.5 *Minimum Uniformly Distributed Live Loads* of the 2018 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.

#### CONCENTRATED LOAD TEST

The concentrated load tests were conducted in accordance with Table R301.5 *Minimum Uniformly Distributed Live Loads* of the 2018 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 two (2) 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.

As there were no posts in the railing system, the concentrated load at the top of post was not evaluated. 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 CENDEK RAILINGS LTD.**

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**SECTION 8**

**TEST SPECIMEN DESCRIPTION**

The sample was identified as the following:

TABLE 1. RAILING CONFIGURATION							
PART NAME	PART NUMBER	QTY	PART DIMENSIONS				REPORTED MATERIAL
			LENGTH	WIDTH	HEIGHT	NOMINAL THICKNESS	
<b>8 FT. CENTURY ROUND COMPONENT PANEL – WB MOUNT</b>							
Top Rail Wall Bracket	4104-WAL-10100	2	3.5 in.	2.5 in.	1.375 in.	0.125 in.	Aluminum
Bottom Rail Wall Bracket	4100-WAL-10100	2	2.38 in.	1.75 in.	1.03 in.	0.125 in.	Aluminum
Top Rail	N/A	1	96.0 in.	2.36 in.	1.89 in.	0.08 in.	Aluminum
Bottom Rail	N/A	1	96.0 in.	1.32 in.	1.41 in.	0.07 in.	Aluminum
Support Leg	4600-LEG-60100	2	2.50 in.	1.00 in.	2.92 in.	0.125 in.	Aluminum
Infill - Picket	N/A	21	0.625 in.	0.625 in.	39.0 in.	0.050 in.	Aluminum

Note 1: The railing had two (2) support legs positioned under the bottom rail spaced 32.75 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 2: As the railing system had no posts, the assembly was attached to a wood support through wall brackets. Per the client’s request, the guard assembly was attached using supplied #12 x 2 in. long Pan Head Robertson steel sheet metal screws (0.416 in. head diameter x 0.158 in. shank diameter). The wood support was constructed from 2 layers of nominal 2 in. x 12 in. SPF lumber.

## TEST REPORT FOR CENDEK RAILINGS LTD.

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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 8 ft. Century Round Component Panel – WB Mount railing system per ASTM E935-13e1, *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 system to resist the loads as prescribed in the following building code articles:

#### **2018 International Residential Code (IRC)**

- R301.5 *Live Load*

The Cendek Railings Ltd. 8 ft. Century Round Component Panel – WB Mount railing system 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  
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**TEST REPORT FOR CENDEK RAILINGS LTD.**

Report No.: 104715588COQ-002E

Date: 08/16/21

**SECTION 11**

**APPENDIX A – TEST DATA (2 PAGES)**

Company	Cendek Railings Ltd.	Technician(s)	Kevin Penner
Project No.	G104715588	Reviewer	Baldeep Sandhu
Models	8 ft. Century Round Component Panel - WB Mount	Start/End Date	July 19, 2021
Product Name	Same as above	Sample ID	VAN2107090927-001
Standard	2018 International Residential Code (IRC)		

## Test Data Package

### Table of Contents

Sheet	Page
Table of Contents (This Sheet)	1
Loads on Guards - 8 ft. Century Round Component Panel - WB Mount	2

Test:	<b>Loads on Guards</b>		Project:	G104715588
Date:	19-Jul-21		Eng/Tech:	Kevin Penner
Client:	Cendek Railings Ltd.			Baldeep Sandhu
Product:	<b>8 ft. Century Round Component Panel - WB Mount</b>		Reviewer:	Coquitlam, BC, Canada
Post Spacing:	8.04 ft	2.45 m		
Height of Guard:	42.1 in	1070 mm		
Opening in Guard:	3.88 in	98 mm		(between pickets)
	2.25 in	57 mm		(under bottom rail)
Method:	ASTM E935-13e1, <i>Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings</i> 2018 International Residential Code (IRC)			
Safety Factor:	2.50			
Equipment:	Artech 5000 lbf Load Cell (Intertek ID# P60692, cal due October 22, 2021)			
	T&D TR-72Ui Temperature and Humidity Logger (Intertek ID# P60554, cal due September 10, 2021)			
	Stopwatch (Intertek ID# P60444, cal due March 5, 2022)			
	Mitutoyo Digital Caliper (Intertek ID# 52650, cal due June 8, 2022)			
Time/Temp/RH:	12:50PM / 22.9°C / 49.0%			

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	<b>Pass</b>
	Midspan Horizontal Concentrated Load	200	500	-	-	500	<b>Pass</b>
	Top Rail Adjacent to Connection Concentrated Load	200	500	-	-	500	<b>Pass</b>

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	<b>Pass</b>
	Midspan Horizontal Concentrated Load	0.89	2.22	-	-	2.22	<b>Pass</b>
	Top Rail Adjacent to Connection Concentrated Load	0.89	2.22	-	-	2.22	<b>Pass</b>



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Report No.: 104715588COQ-002E

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**APPENDIX B – PHOTOS (2 PAGES)**

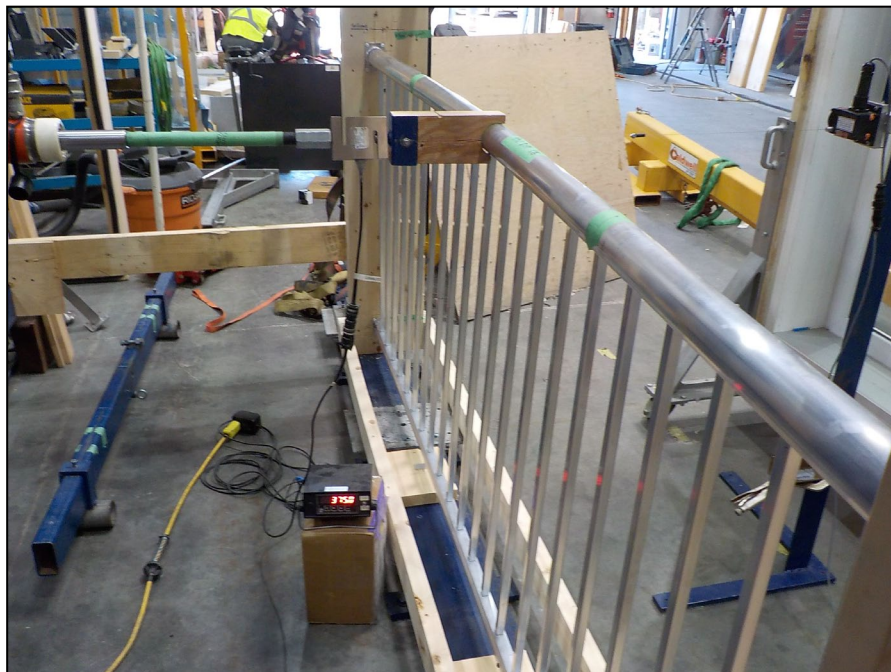
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Report No.: 104715588COQ-002E

Date: 08/16/21



**Figure 1. In-fill Load Test**



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

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



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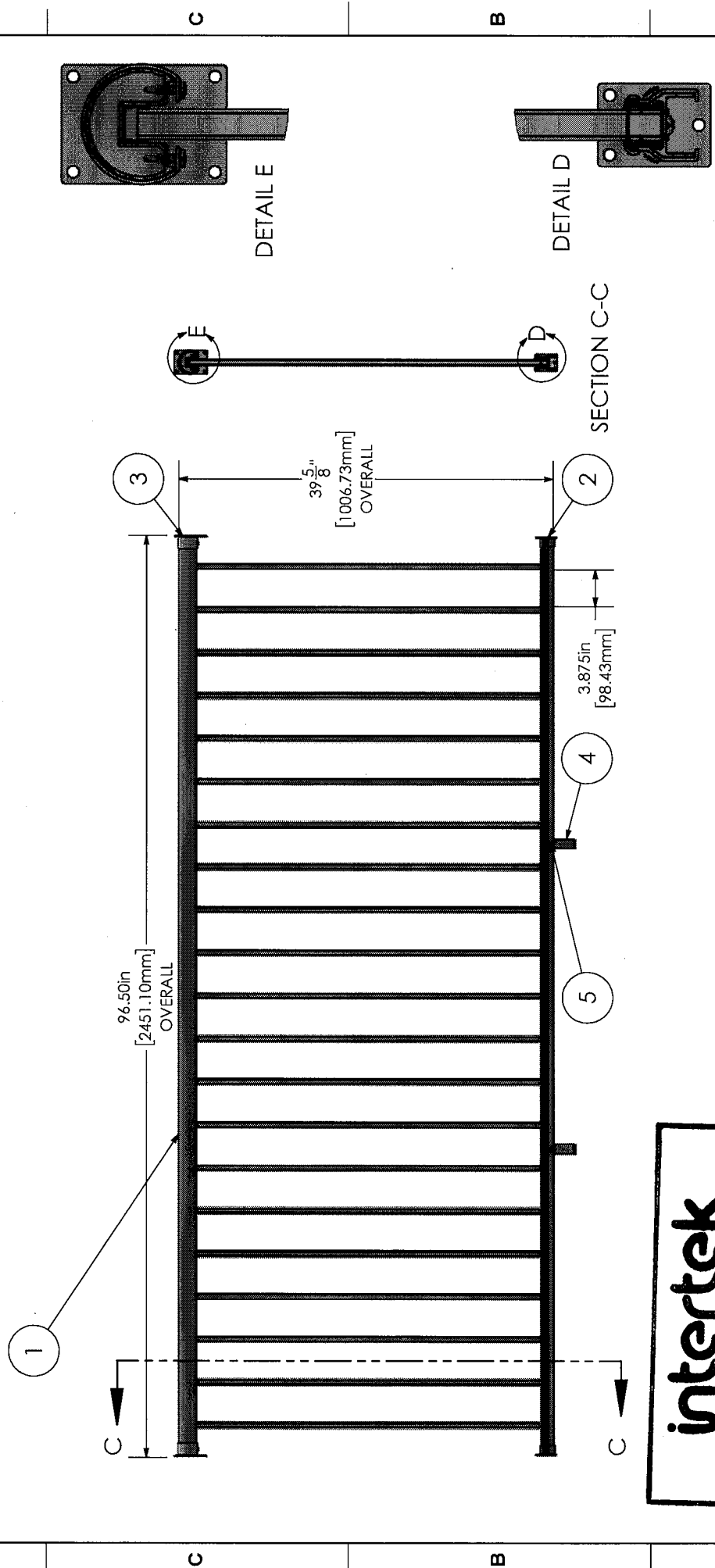
Report No.: 104715588COQ-002E

Date: 08/16/21

**APPENDIX C – CENTURY ROUND COMPONENT PANEL DRAWINGS (7 PAGES)**

1 2 3 4

ITEM NO.	Eng No.	Part No.	DESCRIPTION	QTY.
1	2593A	NA	Century Round 8' 5/8" Component Panel	1
2	0033A	4100-WAL-10100	Bottom Wall Bracket	2
3	0032AA	4104-WAL-10100	Top Wall Bracket Round	2
4	0060PA	4600-LEG-60100	Surface Support Leg - SL	2
5	0096PA	9000-SLB-20001	Screw #10x3/4" P/H Soc Tek Zinc	12



**intertek**  
 Test sample complies with these details.  
 Deviations are noted.  
 Report #: 10471558600-002E  
 Date: 08/16/21 Tech: C.C.

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DRAWN BY	Engl
CREATED	2021-07-19
MATERIAL	
DIE NO.	

ALL DIMENSION IN INCHES/MM

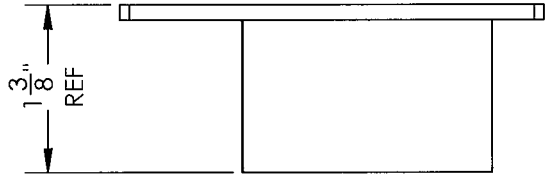
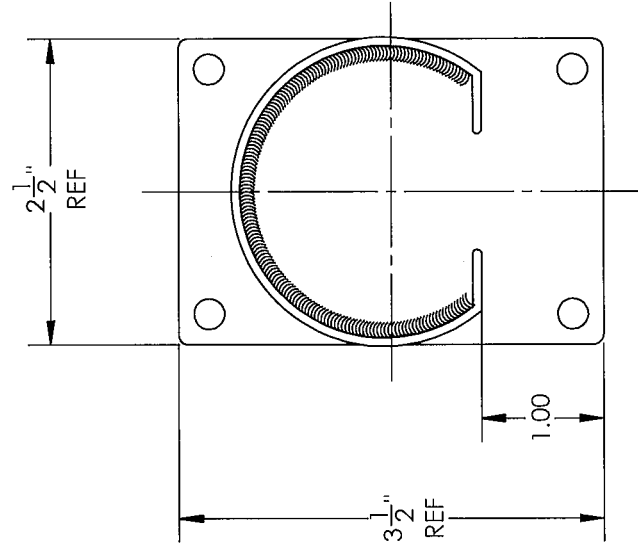
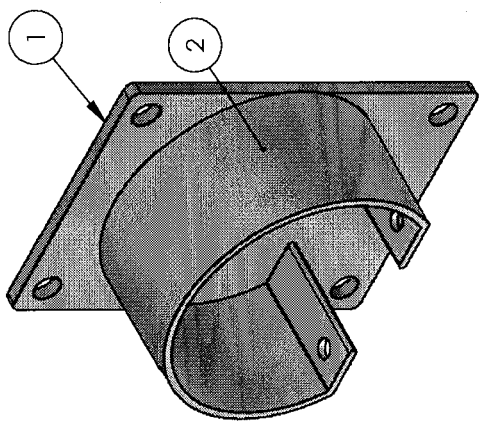
DESCRIPTION	Century Round 8' 5/8" Component Panel WB System
Part No. NA	Eng No. 2591A
Weight	19.32 lbs
SHEET 1 OF 1	Rev -

1 2 3 4



4 3 2 1

ITEM NO.	Eng No.	Part No.	DESCRIPTION	QTY.
1	0014PE	1700-FLA-16007	Flat Bar Cut 1/8" x 2-1/2" x 3-1/2" Uni/Rnd WB, 90° WB x4	1
2	0012PA	1604-SLE-20025	Top Rail Sleeve Round cut WB, Post Sleeve	1



**intertek**

Test sample complies with these details.  
Deviations are noted.

Report #: 101715588000-002E

Date: 08/16/21 Tech: C.L.

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	CHECKED			Top Wall Bracket Round
	MATERIAL	Material <not specified>		
	DIE NO.			
ALL DIMENSION IN INCHES/MM				Part No. 4104-WAL-10100
				Eng No. 0032AA
				Weight 0.16 lbs
				SHEET 1 OF 2
				Rev. 1

D C B A

3 2 1

4 3 2 1

1

2

3

4

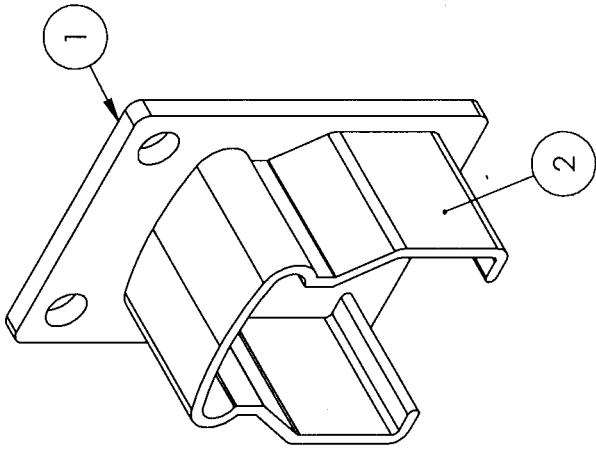
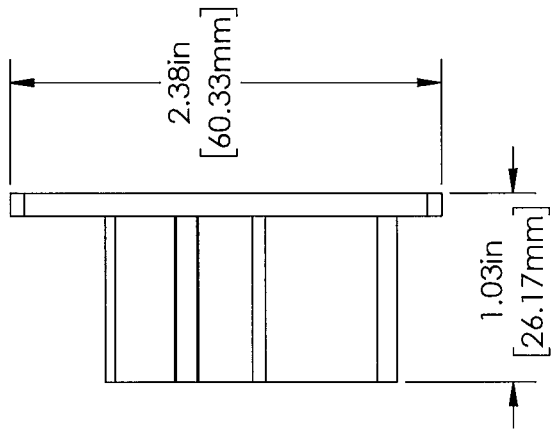
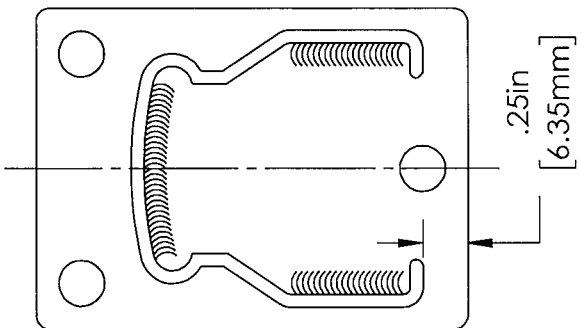
ITEM NO.	Eng No.	Part No.	DESCRIPTION	QTY.
1	0014PH	1700-FLA-13002	Flat Bar Cut 1/8" x 1-3/4" x 2-3/8" BR WB, BR 90° WB x3	1
2	0051PA	1600-SLE-10011	Bottom Rail Sleeve Welded Cut WB	1

**intertek**

Test sample complies with these details.  
Deviations are noted.

Report #: 10475588COQ-002E

Date: 08/16/21 Tech: C.C.



D

C

B

A

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Railings Ltd.

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DRAWN BY	Admin
CREATED	10/3/2017
MATERIAL	Material <not specified>
DIE NO.	
ALL DIMENSION IN INCHES/MM	

DESCRIPTION  
Bottom Wall Bracket

Part No. 4100-WAL-10100    Eng No. 0033A

Weight 0.08 lbs    SHEET 1 OF 2    Rev -

REV.	DESCRIPTION	DATE	INITIALS

1

2

3

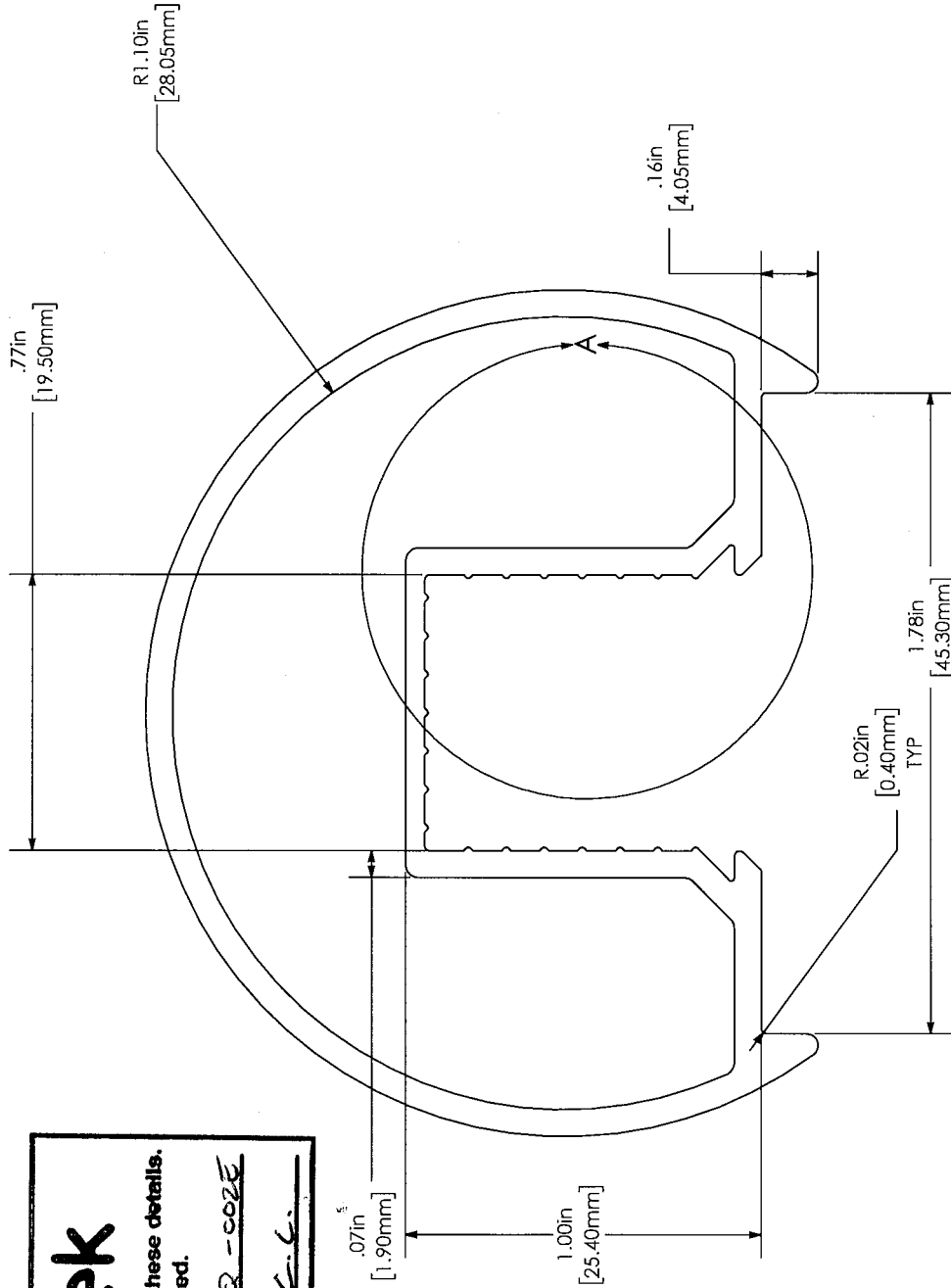
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# Intertek

Test sample complies with these details.  
Deviations are noted.

Report #: 104715588COR-CO2E

Date: 08/16/21 Tech: C.C.



EXTRUSION TOLERANCE		MACHINING TOLERANCE	
Dimension (mm)	Tolerance	Dimension (mm)	Tolerance
≤100	±0.5	≤10	±0.2
>100-500	±0.8	>10-20	±0.3
>500-1000	±1.0	>20-30	±0.4
>1000-1500	±1.5	>30-40	±0.5
>1500-3000	±1.8	>40-60	±0.6
>3000-6000	±2.0	>60-100	±0.8
Above 6000	±2.5	Above 100	±1.0

REV.	DESCRIPTION	DATE	INITIALS

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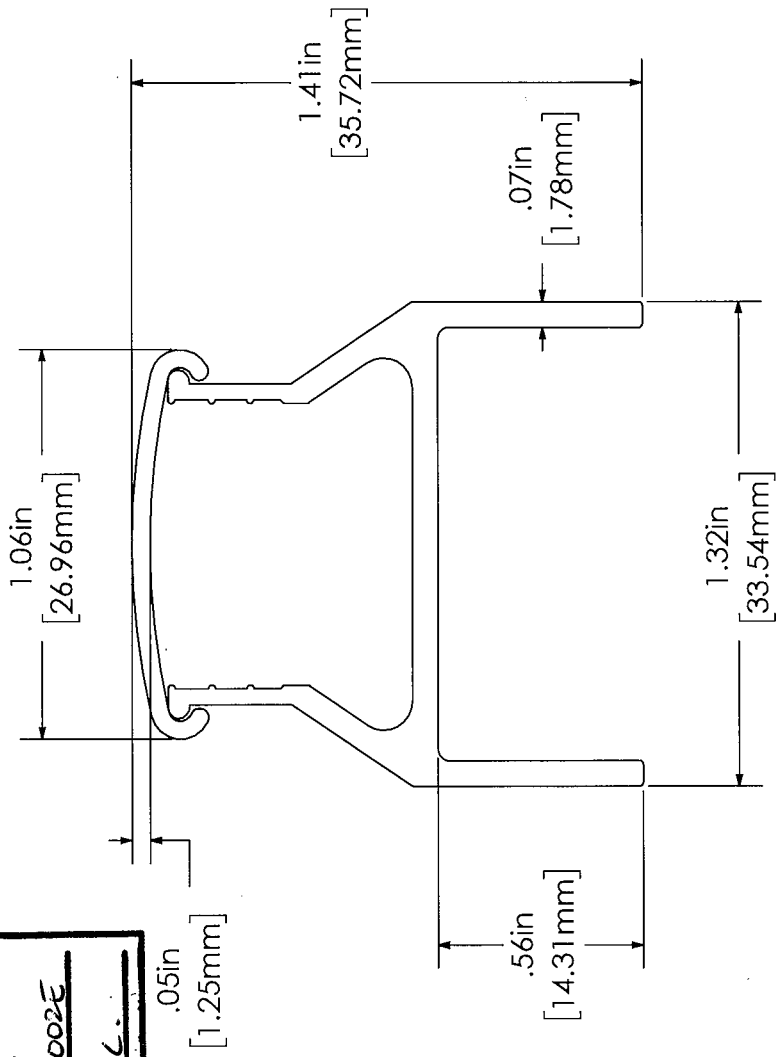
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DRAWN BY	Admin
CREATED	2/27/2018
MATERIAL	6063-T5
DIE NO.	DYG12073190
ALL DIMENSION IN INCHES/MM	

DESCRIPTION  
Century Top Rail Die

Part No.	Eng'g. 0041P
Weight	0.77 lbs
SHEET	1 OF 1
Rev	-

**intertek**  
 Test sample complies with these details.  
 Deviations are noted.  
 Report #: 104715588 COR-002E  
 Date: 08/16/21 Tech: C.C.



DRAWN BY Admin		DESCRIPTION 5/8" Picket Bottom Rail	
CREATED 8/13/2019	Part No. Eng No. 0684AH		
MATERIAL	Weight	lbs	Rev -
DIE NO.	SHEET 1 OF 1		
ALL DIMENSION IN INCHES/MM			

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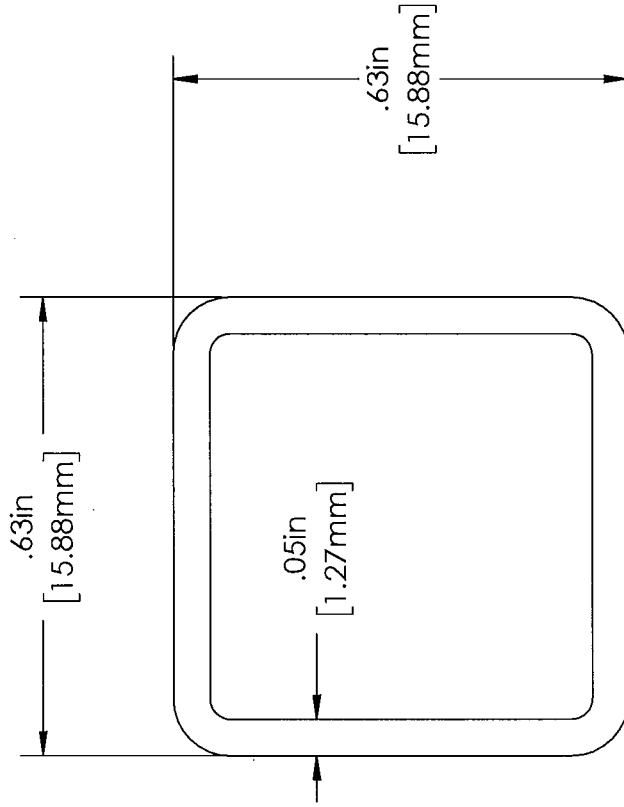
REV.	DESCRIPTION	DATE	INITIALS

# intertek

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DRAWN BY Admin  
CREATED 9/19/2017  
MATERIAL 6063-T5  
DIE NO.  
ALL DIMENSION IN INCHES/MM

DESCRIPTION  
5/8" Picket

REV.	DESCRIPTION	DATE	INITIALS
-		07/21/2021	SB

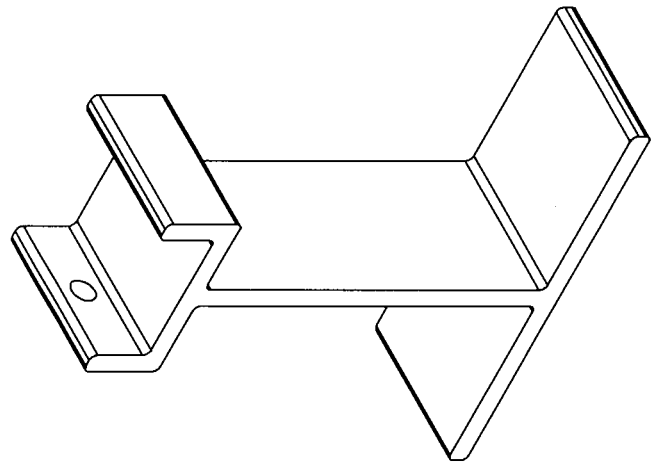
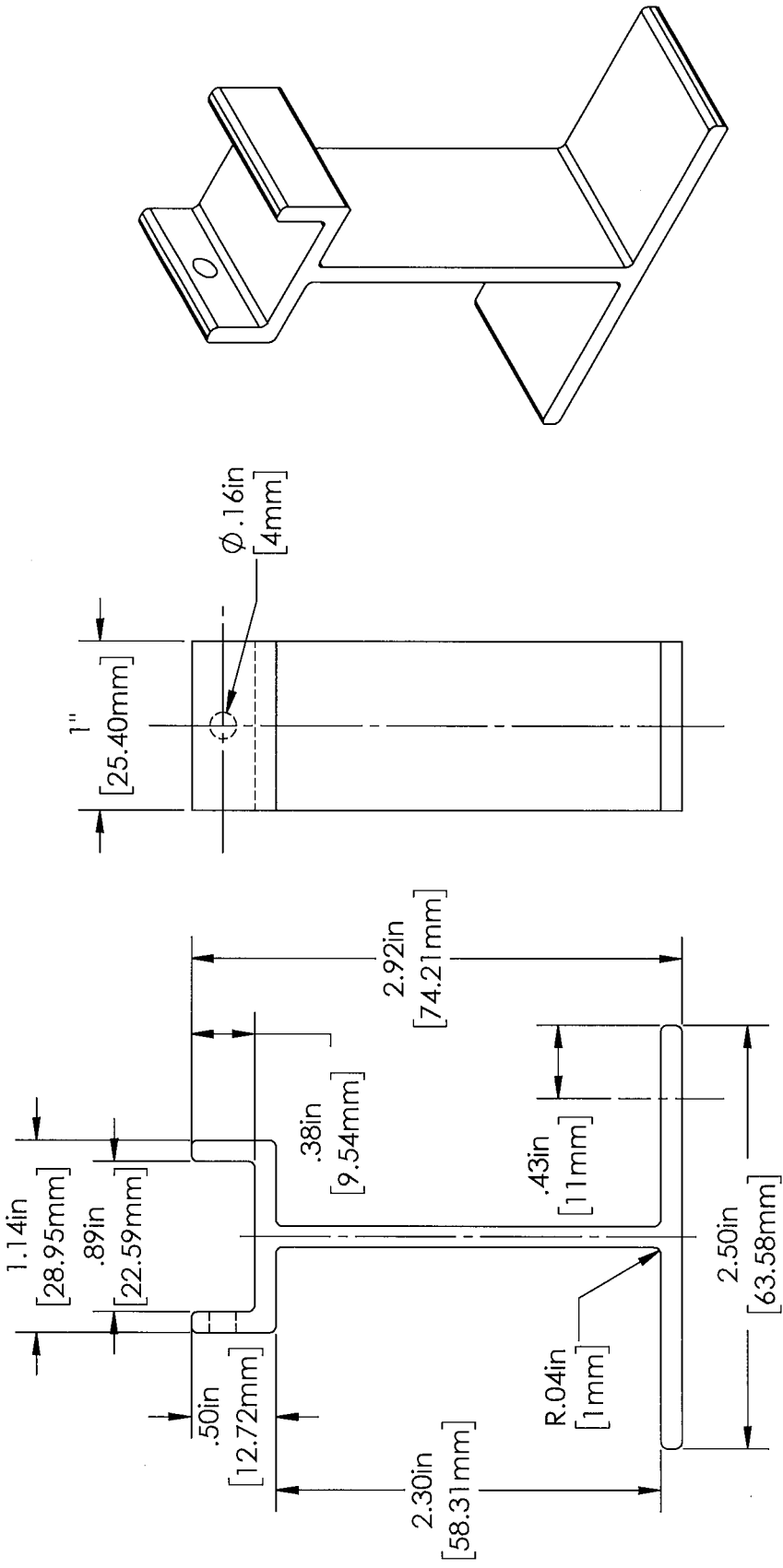
Part No.	Weight	0.41 lbs	Eng. No.	SHEET 1 OF 2	Rev -
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4 3 2 1

D C B A

4 3 2 1

4 3 2 1



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 Report #: 10471558800R-000E  
 Date: 08/16/21 Tech: C.C.

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DRAWN BY	Admin
CREATED	10/21/2017
MATERIAL	6063-T5
DIE NO.	
ALL DIMENSION IN INCHES/MM	

DESCRIPTION  
 Surface Support Leg - SL

Part No. 4600-LEG-60100	Eng. No. 0060PA
Weight 0.08 lbs	SHEET 2 OF 2
	Rev

D C B A

## TEST REPORT FOR CENDEK RAILINGS LTD.

Report No.: 104715588COQ-002E

Date: 08/16/21

### SECTION 12

#### REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	08/16/21	N/A	Original Report Issue