

FORTRESS BUILDING PRODUCTS TEST REPORT

SCOPE OF WORK

STRUCTURAL PERFORMANCE TESTING ON THE AVANT VERTICAL CABLE GUARDRAIL SYSTEM

REPORT NUMBER

L0293.01-119-19 R0

TEST DATES

06/12/20 - 06/15/20

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TEST REPORT FOR FORTRESS BUILDING PRODUCTS

Report No.: L0293.01-119-19 R0

Date: 08/26/20

REPORT ISSUED TO

FORTRESS BUILDING PRODUCTS

1720 North First Street

Suite B

Garland, Texas 75040

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by Fortress Building Products to perform structural performance testing in accordance with the 2018 IRC on their 8 ft wide by 42 in high *AVANT Vertical Cable* aluminum guardrail system. All tests performed were to evaluate structural performance of the guardrail assembly to carry and transfer imposed loads to the supporting structure. The test specimens evaluated included the infill, rails, rail brackets, and support posts. Anchorage of support posts to the supporting structure is not included in the scope of this testing and would need to be evaluated separately.

Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at Intertek test facility in York, Pennsylvania. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

SECTION 2

SUMMARY OF TEST RESULTS

The specimens met the 2018 IRC design load performance requirements.

For INTERTEK B&C:

COMPLETED BY:	Adam J. Schrum
TITLE:	Project Manager
SIGNATURE:	
DATE:	08/26/20

REVIEWED BY:	V. Thomas Mickley, Jr., P.E.
TITLE:	Senior Staff Engineer
SIGNATURE:	
DATE:	08/26/20

AJS:vtm/aas

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SECTION 3

TEST METHOD(S)

The specimens were evaluated in accordance with the following:

2018, *International Residential Code*[®], International Code Council

Structural tests were performed according to Chapter 17 (Structural Tests and Special Inspections) of IBC 2018.

SECTION 4

MATERIAL SOURCE/INSTALLATION

Test samples were provided by the client.

The 8 ft by 42 in level guardrail assembly was installed and tested as a single railing section by directly securing (surface-mounting) the base of the post mounts to a rigid steel test frame (simulated concrete). The 8 ft by 42 in stair guardrail assembly was installed and tested as a single railing section by directly securing the posts into a rigid steel test fixture, which rigidly restrained the posts from deflecting. Transducers mounted to an independent reference frame were located to record movement of reference points on the guardrail system components (ends and mid-point) to determine net component deflections. See photographs in Section 11 for individual test setups.

SECTION 5

EQUIPMENT

The guardrail was tested in a self-contained structural frame designed to accommodate anchorage of the guardrail assembly and application of the required test loads. The specimens were loaded using an electric winch mounted to a rigid steel test frame. High strength steel cables, nylon straps, and load distribution beams were used to impose test loads on the specimens. Applied load was measured using an electronic load cell located in-line with the loading system. Electronic linear motion transducers were used to measure deflections.

SECTION 6

LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Adam J. Schrum	Intertek B&C

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SECTION 7**TEST PROCEDURE**

Each test specimen was inspected prior to testing to verify size and general condition of the materials, assembly, and installation. No potentially compromising defects were observed prior to testing.

An initial load, not exceeding 50% of design load, was applied and transducers were zeroed. Load was then applied at a steady uniform rate until reaching 2.0 times design load in no less than 10 seconds. After reaching 2.0 times design load, the load was released. After allowing a minimum period of one minute for stabilization, load was reapplied to the initial load level used at the start of the loading procedure, and deflections were recorded and used to analyze recovery. Load was then increased at a steady uniform rate until reaching 2.5 times design load or until failure occurred. The testing time was continually recorded from the application of initial test load until the ultimate test load was reached.

Deflection and permanent set were component deflections relative to their end-points; they were not overall system displacements. All loads and displacement measurements were horizontal, unless noted otherwise.

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TEST SPECIMEN DESCRIPTION

Fortress Building Products provided the fully assembled test specimens with the following details:

PRODUCT	AVANT Vertical Cable Aluminum Railing System
MATERIALS	- Stainless steel - Aluminum
RAIL LENGTH	- Level: 93-3/4 in (inside of post to inside of post) - Stair: 96-1/2 in (inside of post to inside of post)
RAIL HEIGHT	- Level: 38-1/2 in (top of top rail to bottom of bottom rail) - Stair: 40-1/2 in (top of top rail to bottom of bottom rail; measured parallel to the balusters)
TOP RAIL	Level: - 1-5/16 in wide by 1-3/8 in high aluminum extrusion with 0.100 in thick wall "closed box" section - 1-7/16 in wide by 1-3/8 in high aluminum extrusion with 0.040 in thick wall inverted "U"-shaped cap Stair: - 1-5/16 in wide by 1-5/16 in high aluminum extrusion with 0.100 in thick wall "open box" section - 1-7/16 in wide by 1-3/8 in high aluminum extrusion with 0.040 in thick wall inverted "U"-shaped cap
BOTTOM RAIL	Level: 1-7/16 in wide by 1-7/16 in high aluminum extrusion with 0.100 in thick wall "closed box" section Stair: 1-7/16 in wide by 1-7/16 in high aluminum extrusion with 0.100 in thick wall "open box" section
IN-FILL	- 1/8 in diameter, 1x19, stainless steel vertical cable (twenty-one (level) and fifteen (stair) equally spaced in groups of three) - Intermediate Support Baluster: 5/8 in diameter with 0.125 in thick wall vertical support baluster (six equally spaced)
SUPPORT BLOCK	5/8 in square by 2 in high cast aluminum
RAIL BRACKETS	Level: Cast aluminum collar bracket Stair: Two-piece hinged cast aluminum collar bracket
POST	2-1/2 in square by 0.150 in thick aluminum tube connected to a 4-1/4 in square by 3/8 in thick aluminum base plate with a 1/4 in continuous fillet weld; the base plate included four 3/8 in diameter holes and one 3/4 in diameter hole

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Fastening Schedule

CONNECTION	FASTENER
Rail Bracket to Post	Two, 1/4-14 by 1" (0.157 in minor diameter), Torx drive, flat-head, self-drilling, steel screws
Rail Bracket to Rail*	One, #12-24 by 3/4", Torx drive, flat-head, Type F thread cutting point, steel screw
Hinged Bracket Connection	Two-piece fastener consisting of one, 1-1/2 in long pan head smooth outside shank female threaded pin and one, #8-32 by 1/4" pan head screw
Intermediate Support Baluster to Top/Bottom Rail	One, 1/4-24 by 1-1/8", allen drive, pan-head, stainless steel machine screw with washer
Cable Infill to Top Rail	Level: Stainless steel swage connector with 5/16 in threaded end, nylon lock nut and washer Stair: Stainless steel swage connector with 5/16 in threaded end, nut and cast aluminum angled washer
Cable Infill to Bottom Rail	Level: Stainless steel swage connector with snap ring Stair: Stainless steel swage connector with snap ring and cast aluminum washer
Support Block to Bottom Rail	Two, #8-18 by 3/4" (0.110 in minor diameter) Phillips drive, flat head, Type A point, stainless steel screws
Support Block to Deck Surface	One, #8-18 by 3/4" (0.110 in minor diameter) Phillips drive, flat head, Type A point, stainless steel screw
Post Mount to Substructure	Four, 3/8 in Grade 5 hex-head bolts with washer

* 5/32 in diameter pre-drill used

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TEST RESULTS

Key to Test Results Tables:

Load Level: Target test load

Test Load: Actual applied load at the designated load level (target).

Elapsed Time (E.T.): The amount of time into the test with zero established at the beginning of the loading procedure.

Test Series No. 1

**8 ft (93-3/4 in) by 42 in AVANT Vertical Cable Level Guardrail System
IRC - One- and Two-Family Dwellings**

Test No. 1 - 06/12/20

Design Load: 50 lb / 1 square ft at Center of In-fill (on 3 Vertical Cables)

LOAD LEVEL	TEST LOAD (lb)	E.T. (min:sec)	DISPLACEMENT (in)			
			END	MID	END	NET
Initial Load	25	00:00	--	0.00	--	--
2.0x Design Load	102	00:19	--	0.80	--	--
Initial Load	25	01:45	--	0.03	--	--
96% Recovery from 2.0 x Design Load						
2.5x Design Load	126	02:00	Achieved Load without Failure			

Test No. 2 - 06/12/20

Design Load: 50 lb / 1 square ft at Bottom of In-fill (on 3 Vertical Cables)

LOAD LEVEL	TEST LOAD (lb)	E.T. (min:sec)	DISPLACEMENT (in)			
			END	MID	END	NET ¹
Initial Load	25	00:00	--	0.00	--	--
2.0x Design Load	100	00:12	--	0.66	--	--
Initial Load	25	01:43	--	0.01	--	--
98% Recovery from 2.0 x Design Load						
2.5x Design Load	129	01:56	Achieved Load without Failure			

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Test No. 3 - 06/12/20

Design Load: 50 lb / 1 square ft at Center of In-fill (on Intermediate Support Baluster)

LOAD LEVEL	TEST LOAD (lb)	E.T. (min:sec)	DISPLACEMENT (in)			
			END	MID	END	NET
Initial Load	25	00:00	--	0.00	--	--
2.0x Design Load	102	00:18	--	0.66	--	--
Initial Load	25	01:47	--	0.03	--	--
95% Recovery from 2.0 x Design Load						
2.5x Design Load	127	02:05	Achieved Load without Failure			

Test No. 4 - 06/12/20

Design Load: 50 lb / 1 square ft at Bottom of In-fill (on Intermediate Support Baluster)

LOAD LEVEL	TEST LOAD (lb)	E.T. (min:sec)	DISPLACEMENT (in)			
			END	MID	END	NET
Initial Load	25	00:00	--	0.00	--	--
2.0x Design Load	102	00:20	--	0.49	--	--
Initial Load	25	01:46	--	0.03	--	--
94% Recovery from 2.0 x Design Load						
2.5x Design Load	130	01:56	Achieved Load without Failure			

Test No. 5 - 06/12/20

Design Load: 200 lb Concentrated Horizontal Load at Midspan of Top Rail

LOAD LEVEL	TEST LOAD (lb)	E.T. (min:sec)	RAIL DISPLACEMENT (in)			
			END	MID	END	NET ¹
Initial Load	50	00:00	0.00	0.00	0.00	0.00
2.0x Design Load	405	01:02	0.69	3.43	0.94	2.62
Initial Load	50	02:43	0.05	0.19	0.06	0.14
95% Recovery from 2.0 x Design Load						
2.5x Design Load	500	03:22	Achieved Load without Failure			

¹ Net displacement was mid-rail displacement relative to the rail at the support posts.

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Test No. 6 - 06/12/20

Design Load: 200 lb Concentrated Horizontal Load at Ends of Top Rail (Brackets)

LOAD LEVEL ¹	TEST LOAD (lb)	E.T. (min:sec)	RAIL DISPLACEMENT (in)	
			RAIL END #1	RAIL END #2
Initial Load	80	00:00	0.00	0.00
(2.0x Design Load) x 2	803	00:44	1.52	2.03
Initial Load	80	02:16	0.15	0.22
90% (Rail End #1) and 89% (Rail End #2) Recovery from 2.0 x Design Load				
(2.5x Design Load) x 2	1004	03:12	Achieved Load without Failure	

¹ A spreader beam was used to impose loads on both ends of the railing system; therefore, loads were doubled.

Test No. 7 - 06/12/20

Design Load: 200 lb Concentrated Load at Top of Stand-Alone ¹ Post (42 in high)

LOAD LEVEL	TEST LOAD (lb)	E.T. (min:sec)	POST DISPLACEMENT (in)
Initial Load	50	00:00	0.00
2.0x Design Load	408	00:34	1.21
Initial Load	50	02:06	0.00
100% Recovery from 2.0 x Design Load			
2.5x Design Load	503	02:25	Achieved Load without Failure

¹ Post was conservatively tested without a railing attached.

Test Series No. 2

96-1/2 in by 42 in by 30° AVANT Vertical Cable Stair Guardrail System

IRC - One- and Two-Family Dwellings

Test No. 1 - 06/15/20

Design Load: 50 lb / 1 square ft at Center of In-fill (on 3 Vertical Cables)

LOAD LEVEL	TEST LOAD (lb)	E.T. (min:sec)	DISPLACEMENT (in)			
			END	MID	END	NET
Initial Load	25	00:00	--	0.00	--	--
2.0x Design Load	101	00:23	--	1.19	--	--
Initial Load	25	01:49	--	0.13	--	--
89% Recovery from 2.0 x Design Load						
2.5x Design Load	129	02:02	Achieved Load without Failure			

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Test No. 2 - 06/15/20

Design Load: 50 lb / 1 square ft at Bottom of In-fill (on 3 Vertical Cables)

LOAD LEVEL	TEST LOAD (lb)	E.T. (min:sec)	DISPLACEMENT (in)			
			END	MID	END	NET
Initial Load	25	00:00	--	0.00	--	--
2.0x Design Load	101	00:27	--	1.12	--	--
Initial Load	25	02:07	--	0.02	--	--
98% Recovery from 2.0 x Design Load						
2.5x Design Load	127	02:24	Achieved Load without Failure			

Test No. 3 - 06/15/20

Design Load: 50 lb / 1 square ft at Center of In-fill (on Intermediate Support Baluster)

LOAD LEVEL	TEST LOAD (lb)	E.T. (min:sec)	DISPLACEMENT (in)			
			END	MID	END	NET
Initial Load	25	00:00	--	0.00	--	--
2.0x Design Load	101	00:21	--	1.01	--	--
Initial Load	25	02:07	--	0.02	--	--
98% Recovery from 2.0 x Design Load						
2.5x Design Load	127	02:23	Achieved Load without Failure			

Test No. 4 - 06/15/20

Design Load: 50 lb / 1 square ft at Bottom of In-fill (on Intermediate Support Baluster)

LOAD LEVEL	TEST LOAD (lb)	E.T. (min:sec)	DISPLACEMENT (in)			
			END	MID	END	NET
Initial Load	25	00:00	--	0.00	--	--
2.0x Design Load	102	00:25	--	0.95	--	--
Initial Load	25	01:56	--	0.00	--	--
100% Recovery from 2.0 x Design Load						
2.5x Design Load	126	02:11	Achieved Load without Failure			

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Test No. 5 - 06/15/20

Design Load: 200 lb Concentrated Horizontal Load at Midspan of Top Rail

LOAD LEVEL	TEST LOAD (lb)	E.T. (min:sec)	RAIL DISPLACEMENT (in)			
			END	MID	END	NET ¹
Initial Load	50	00:00	0.00	0.00	0.00	0.00
2.0x Design Load	401	00:51	0.04	4.00	0.18	3.89
Initial Load	50	02:41	0.00	0.48	0.01	0.48
88% Recovery from 2.0 x Design Load						
2.5x Design Load	501	03:24	Achieved Load without Failure			

¹ Net displacement was mid-rail displacement relative to the rail at the support posts.

Test No. 6 - 06/15/20

Design Load: 200 lb Concentrated Horizontal Load at Ends of Top Rail (Brackets)

LOAD LEVEL ¹	TEST LOAD (lb)	E.T. (min:sec)	RAIL DISPLACEMENT (in)	
			RAIL END #1	RAIL END #2
Initial Load	80	00:00	0.00	0.00
(2.0x Design Load) x 2	813	00:31	0.41	0.75
Initial Load	80	02:08	0.04	0.08
90% (Rail End #1) and 89% (Rail End #2) Recovery from 2.0 x Design Load				
(2.5x Design Load) x 2	1009	02:57	Achieved Load without Failure	

¹ A spreader beam was used to impose loads on both ends of the railing system; therefore, loads were doubled.

**SECTION 10
CONCLUSION**

Using performance criteria of withstanding an ultimate load of 2.5 times design load, the test results substantiate compliance with the design load requirements of the referenced building codes for the 8 ft by 42 in level and stair railing assemblies (AVANT Vertical Cable) reported herein. Anchorage of support posts to the supporting structure is not included in the scope of this testing and would need to be evaluated separately.

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SECTION 11

PHOTOGRAPHS



Photo No. 1
In-Fill Load Test at Center of Vertical Cable



Photo No. 2
In-Fill Load Test at Bottom of Intermediate Support Baluster

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Photo No. 3
Concentrated Load Test at Midspan of Top Rail



Photo No. 4
Concentrated Load Test at Ends of Top Rail (Brackets)

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Photo No. 5

Concentrated Load Test at Top of Stand-Alone Post (42 in high)

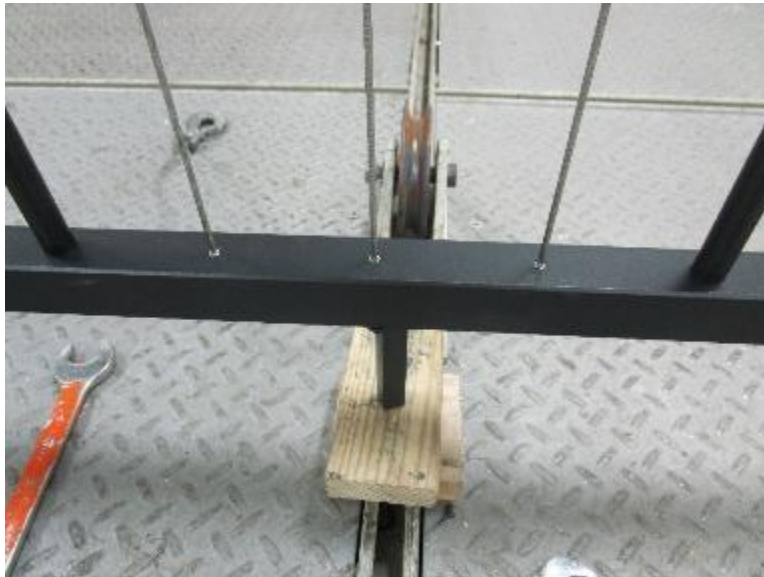


Photo No. 6

Support Block Attached to Bottom Rail

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Photo No. 7
Cast Aluminum Bracket for Level Top Rail



Photo No. 8
Cast Aluminum Bracket for Stair Top Rail



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SECTION 12 DRAWINGS

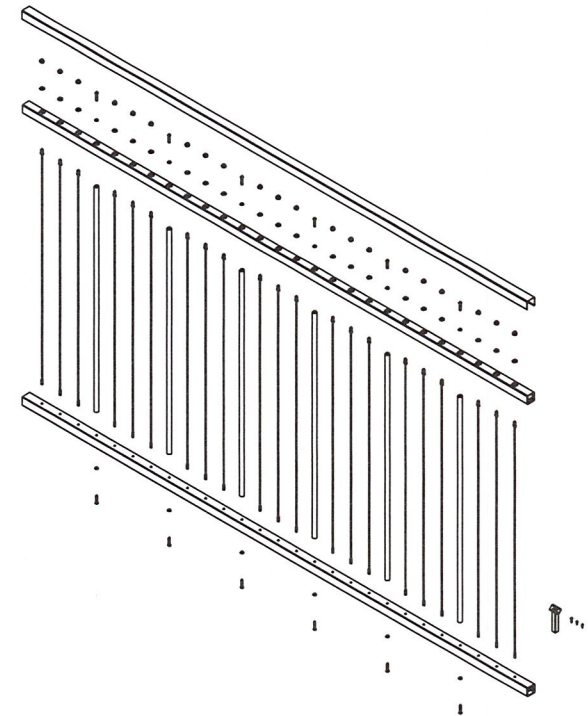
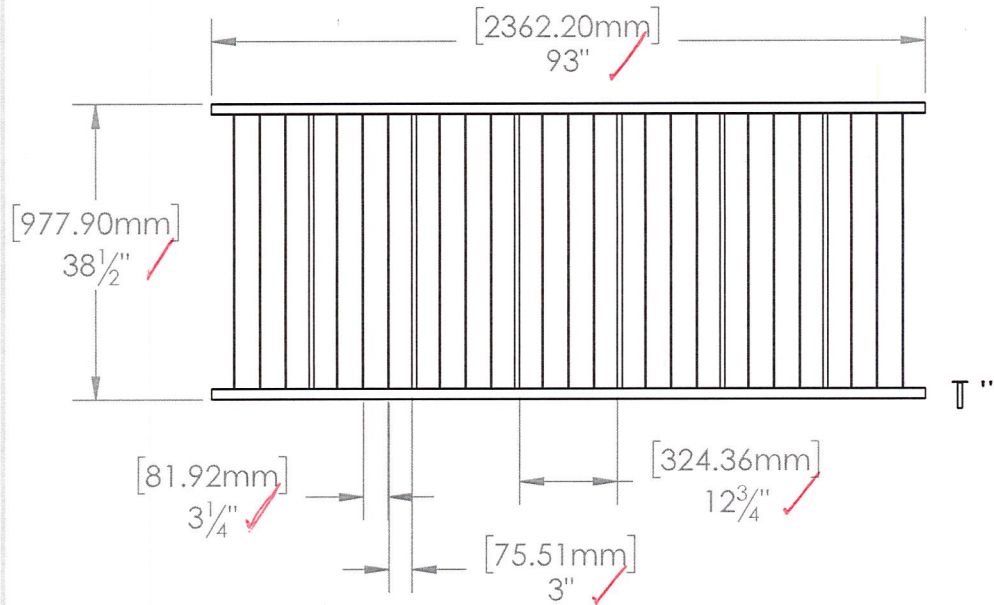
The "As-Built" drawings for the *AVANT Vertical Cable* aluminum guardrail system which follow have been reviewed by Intertek B&C and are representative of the project reported herein. Project construction was verified by Intertek B&C per the drawings included in this report. Any deviations are documented herein or on the drawings.

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Test sample complies with these details.
Deviations are noted.

Report # L0793.01-119-19

Date 7/13/20 Tech AJS



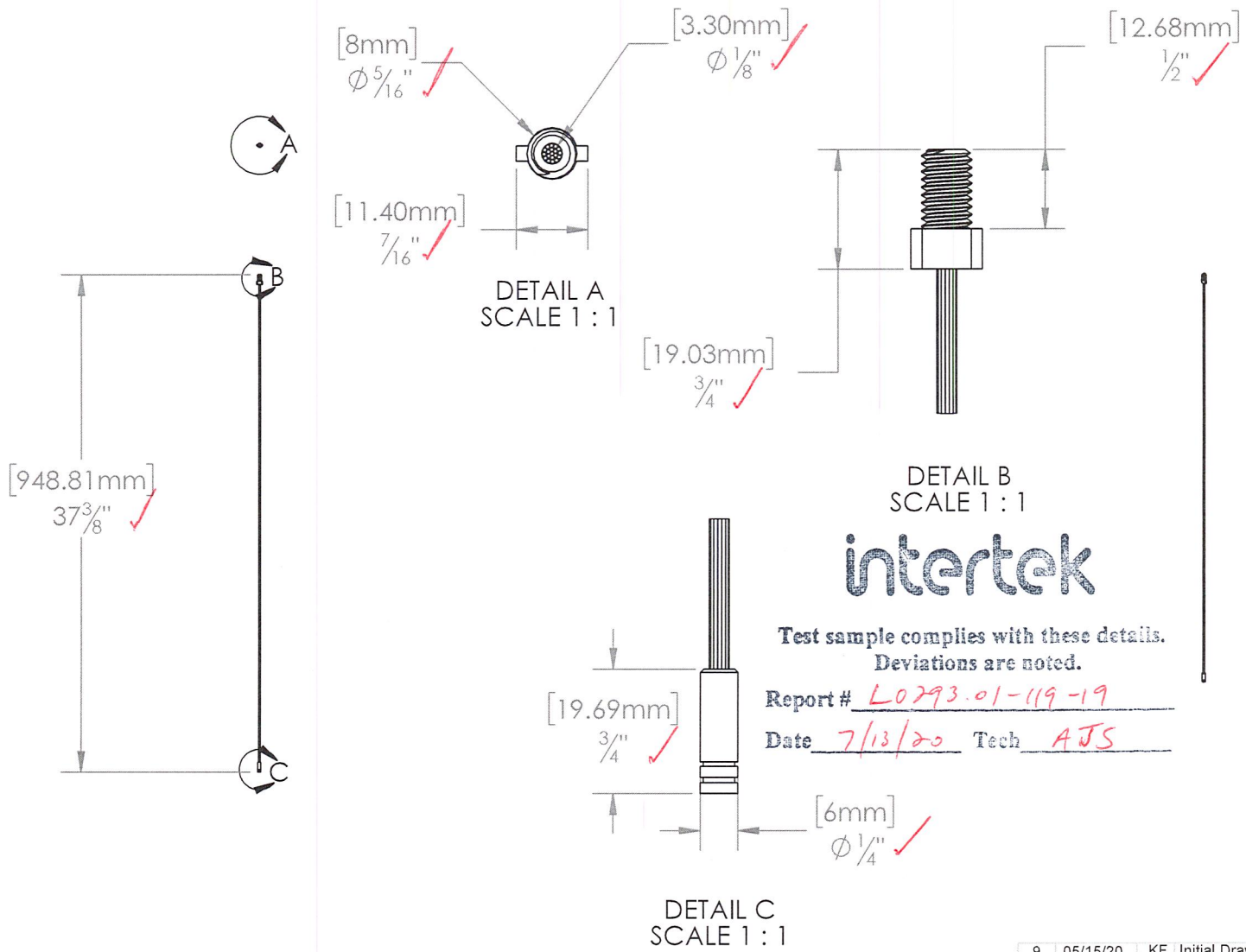
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Fortress Railing
1720 N 1st Street
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Sheet: 1 OF 1

11	02/05/15	KF	Initial Drawing
REV	DATE	BY	DESCRIPTION
DESCRIPTION: AVANT 38.5" X 8' ALUMINUM VERTICAL CABLE PANEL			
DRAWN BY: KevinF			SCALE: AS SHOWN
DATE: 05/12/2020		DIVISION: AVANT	
ITEM #:	FILE NAME/PART #:		REV:
50X107	X3936-10156A		11



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Test sample complies with these details.
 Deviations are noted.

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FORTRESS
 RAILING PRODUCTS

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Sheet: 1 OF 1

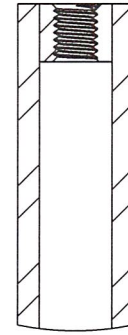
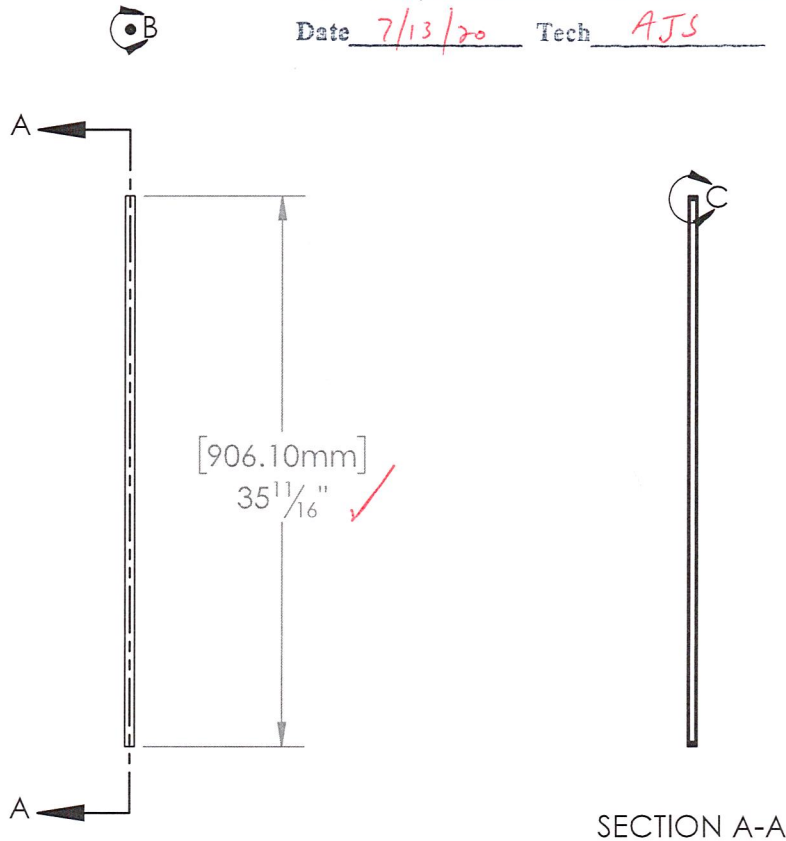
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REV	DATE	BY	DESCRIPTION
DESCRIPTION: AVANT VERTICAL CABLE SWAGE ASSEMBLY 38.5"			
DRAWN BY: KevinF			SCALE: AS SHOWN
DATE: 05/15/2020		DIVISION: RAILING	
ITEM #:	FILE NAME/PART #:		REV:
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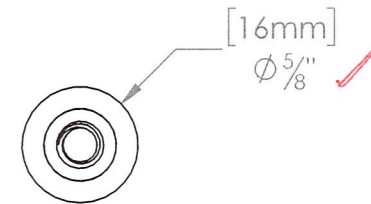
Test sample complies with these details.
Deviations are noted.

Report # L0293.01-119-19

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DETAIL C
SCALE 1 : 1



DETAIL B
SCALE 1 : 1

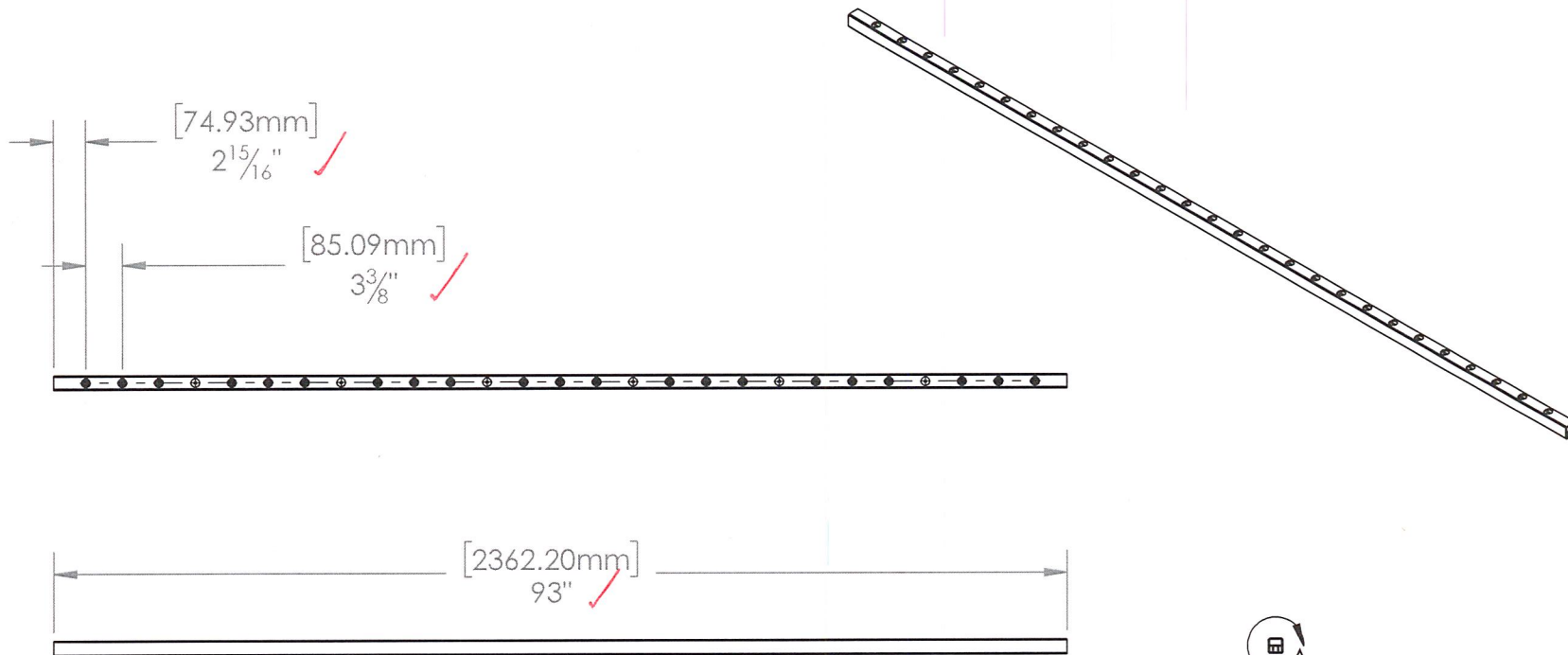
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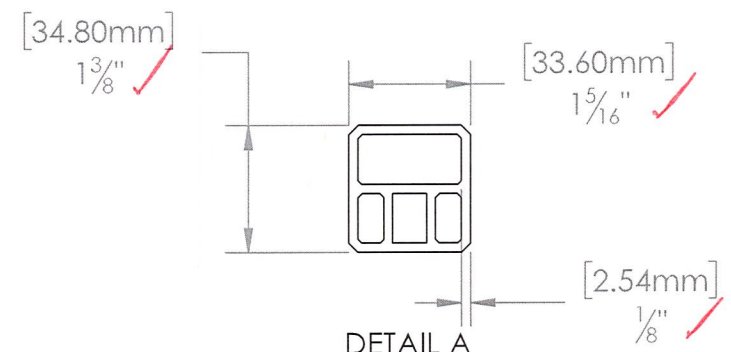
Sheet: 1 OF 1

4	05/15/20	KF	Initial Drawing
REV	DATE	BY	DESCRIPTION
DESCRIPTION: 3mm VERTICAL CABLE MIDSPAN SUPPORT			
DRAWN BY: KevinF			SCALE: 1:12
DATE: 05/15/2020		DIVISION:	
ITEM #:	FILE NAME/PART #:		REV:
	X3932-10353A		4



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Test sample complies with these details.
 Deviations are noted.
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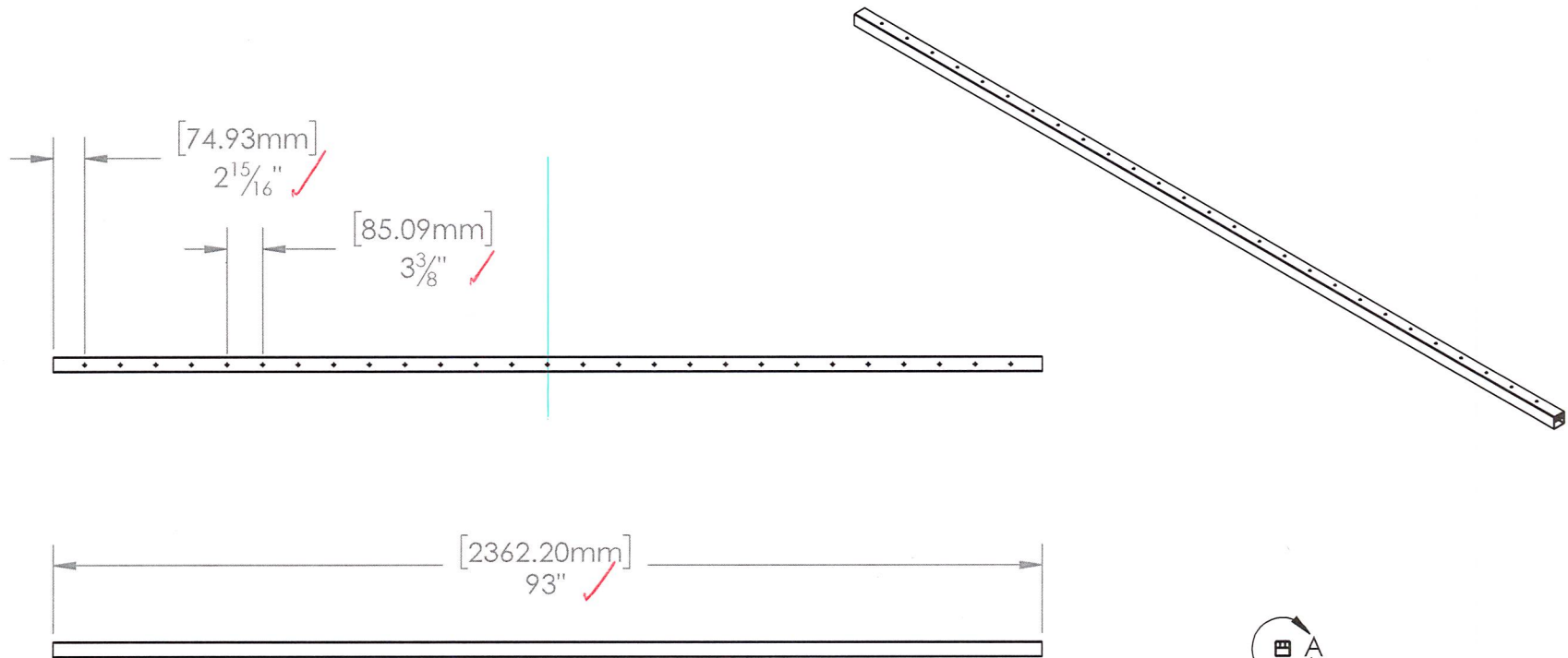
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FORTRESS
 — RAILING PRODUCTS —

Fortress Railing
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 Garland, Tx 75040

Sheet: 1 OF 1

A	05/15/20	KF	Initial Drawing
REV	DATE	BY	DESCRIPTION
DESCRIPTION:			
AVANT VERTICAL CABLE TOP RAIL 8'			
DRAWN BY: KevinF		SCALE: AS SHOWN	
DATE: 05/15/2020		DIVISION: RAILING	
ITEM #:	FILE NAME/PART #:	REV:	
	X3931-10148A	A	

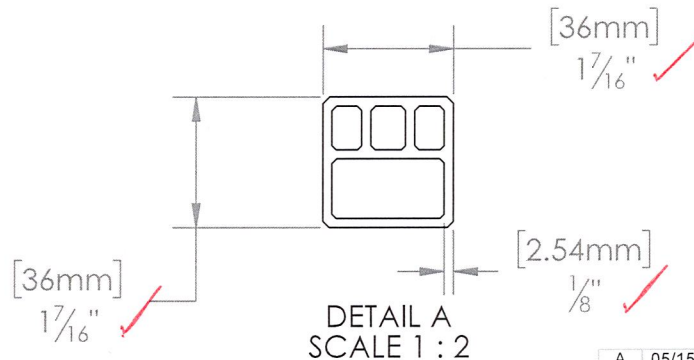


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Test sample complies with these details.
Deviations are noted.

Report # L0293.01-119-19

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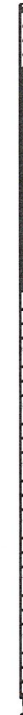
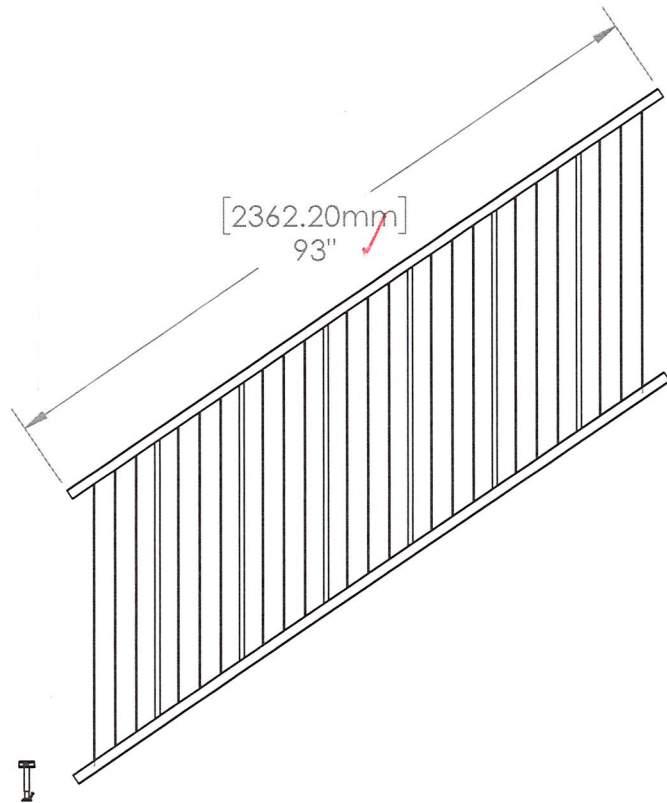
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Fortress Railing
1720 N 1st Street
Garland, Tx 75040

Sheet: 1 OF 1

REV	DATE	BY	DESCRIPTION
A	05/15/20	KF	Initial Drawing
DESCRIPTION: AVANT VERTICAL CABLE BOTTOM RAIL 8'			
DRAWN BY: KevinF			SCALE: 1:16
DATE: 05/15/2020		DIVISION: AVANT	
ITEM #:	FILE NAME/PART #:		REV:
	X3931-10149A		A



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Test sample complies with these details.
Deviations are noted.

Report # L0293-01-119-19

Date 7/13/20 Tech AJS

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Fortress Railing

1720 N 1st Street
Garland, Tx 75040

Sheet: 1 OF 1

ITEM #:
50X108

FILE NAME/PART #:
X3936-09950A

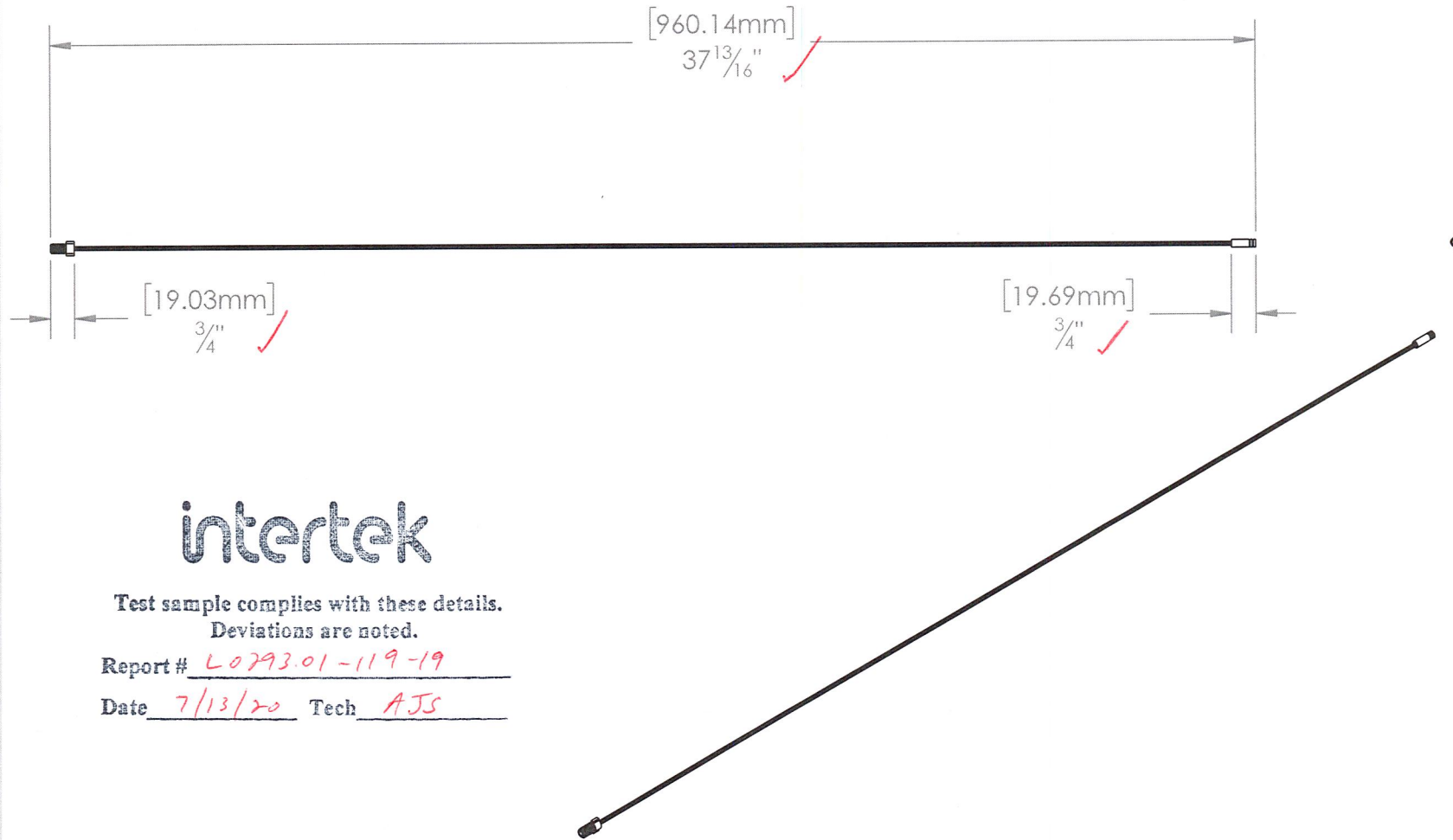
REV:
7

REV	DATE	BY	DESCRIPTION
7	07/01/20	KF	Initial Drawing

DESCRIPTION:
AVANT 38.5" X 8' ALUMINUM VERTICAL CABLE
STAIR AND RAMP PANEL

DRAWN BY: KevinF
DATE: 07/01/2020 DIVISION: OEM

SCALE:
AS SHOWN



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Test sample complies with these details.
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Report # L0293.01-119-19

Date 7/13/20 Tech AJS

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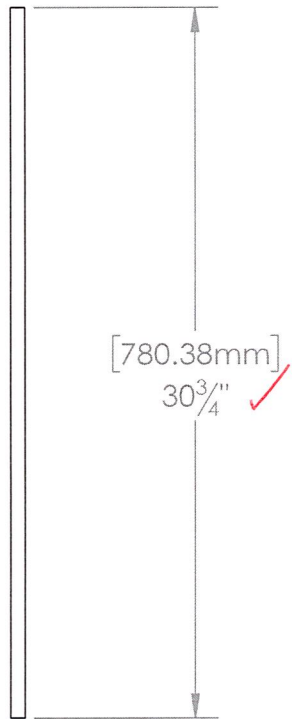
Fortress Railing

1720 N 1st Street
 Garland, Tx 75040

Sheet: 1 OF 1

2	07/01/20	KF	Initial Drawing
REV	DATE	BY	DESCRIPTION
DESCRIPTION:			
AVANT VERTICAL CABLE ADJ SWAGE ASSEMBLY 38.5"			
DRAWN BY: KevinF		SCALE:	
DATE: 07/01/2020		DIVISION:	
ITEM #:		FILE NAME/PART #:	
X3233-10404A		REV:	
		2	

[16mm]
 $\phi 5/8$ ✓



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Test sample complies with these details.
 Deviations are noted.

Report # L0293.01-119-19

Date 7/13/20 Tech AJS

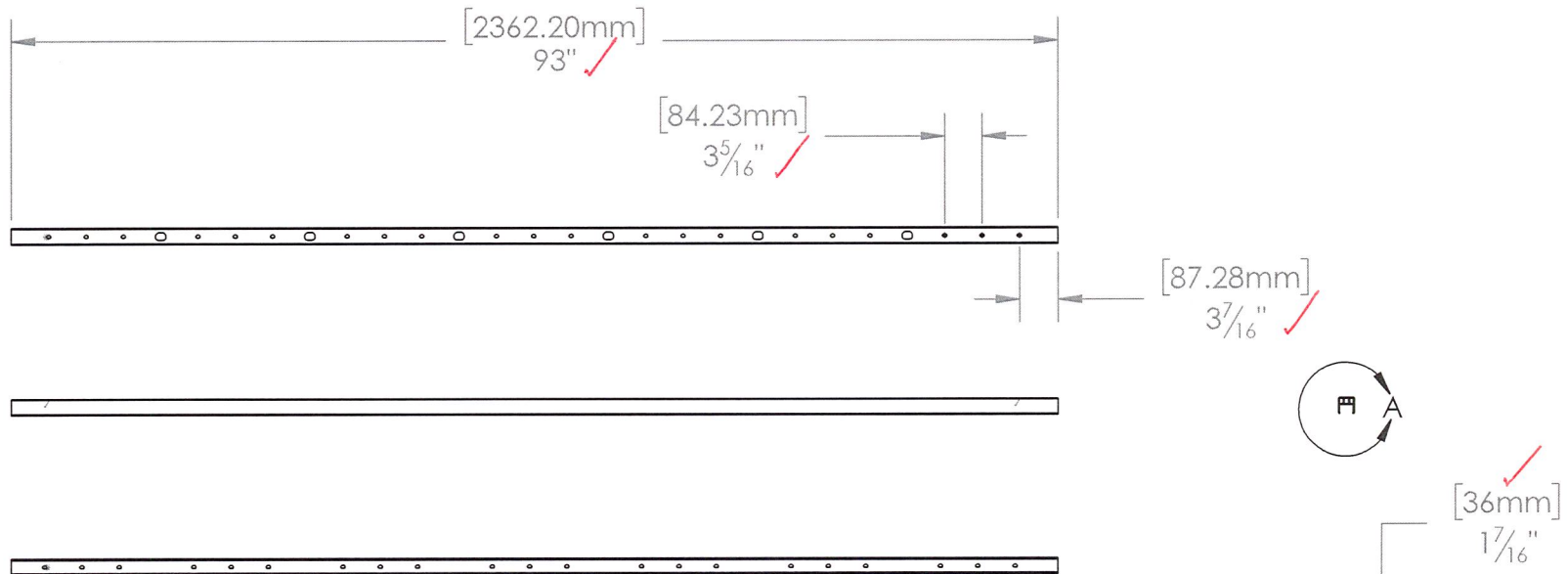
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Fortress Railing
 1720 N 1st Street
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Sheet: 1 OF 1

5	07/01/20	KF	Initial Drawing
REV	DATE	BY	DESCRIPTION
DESCRIPTION: AVANT ADJ MIDSPAN SPT			
DRAWN BY: KevinF		SCALE: AS SHOWN	
DATE: 07/01/2020		DIVISION: OEM	
ITEM #:	FILE NAME/PART #:	REV:	
	X3932-10200A	5	

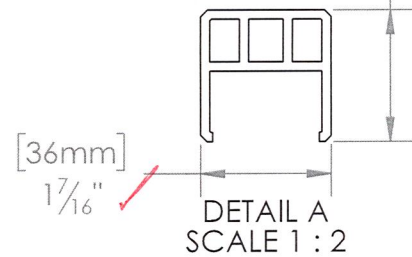


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Fortress Railing
1720 N 1st Street
Garland, Tx 75040

Sheet: 1 OF 1

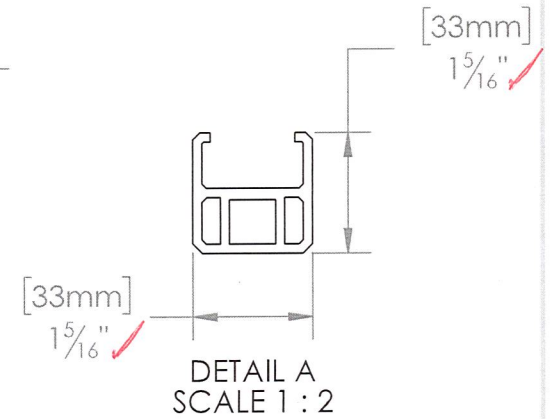
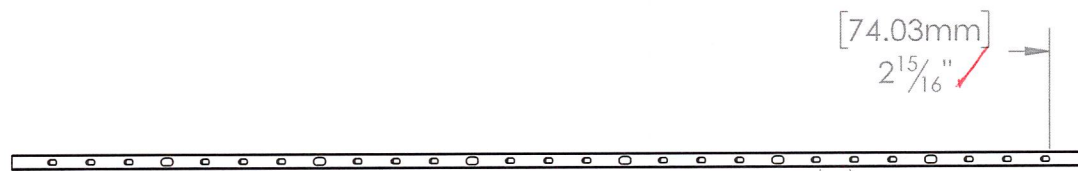
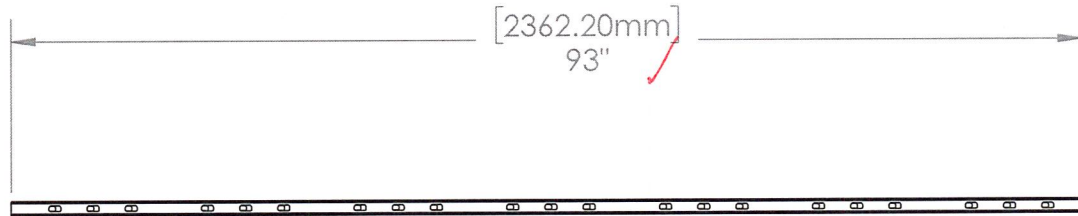
A	02/05/15	KF	Initial Drawing
REV	DATE	BY	DESCRIPTION
DESCRIPTION:			
AVANT VERTICAL CABLE ADJUSTABLE BOTTOM RAIL 8'			
DRAWN BY: KevinF		SCALE: AS SHOWN	
DATE: 07/01/2020		DIVISION: OEM	
ITEM #:	FILE NAME/PART #:		REV:
	X3931-09949A		A

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Date 7/13/20 Tech AJS



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Fortress Railing
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Sheet: 1 OF 1

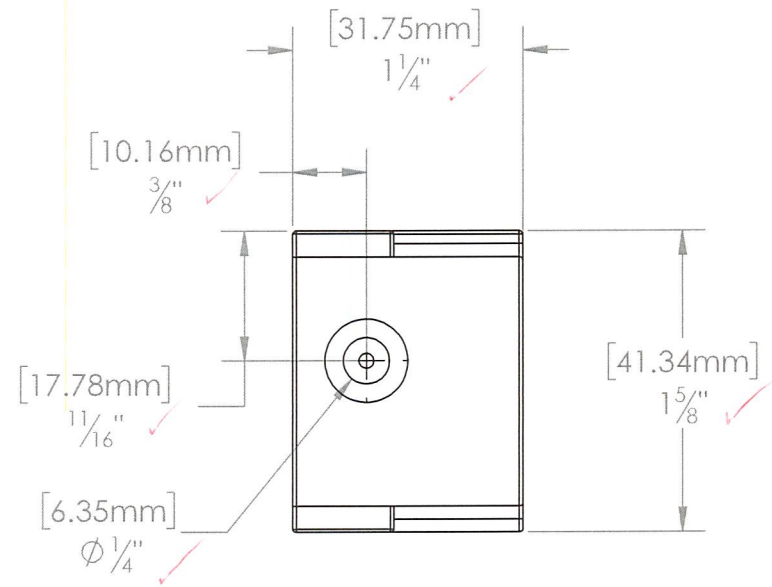
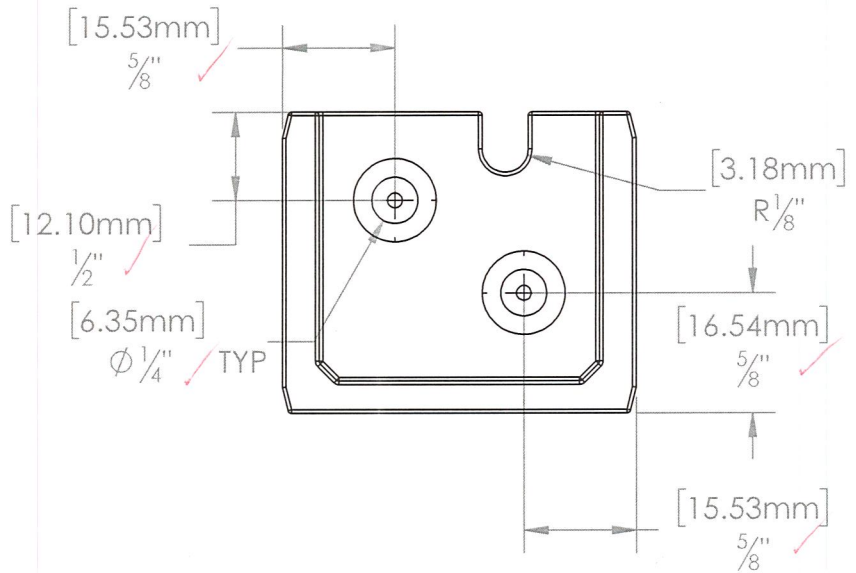
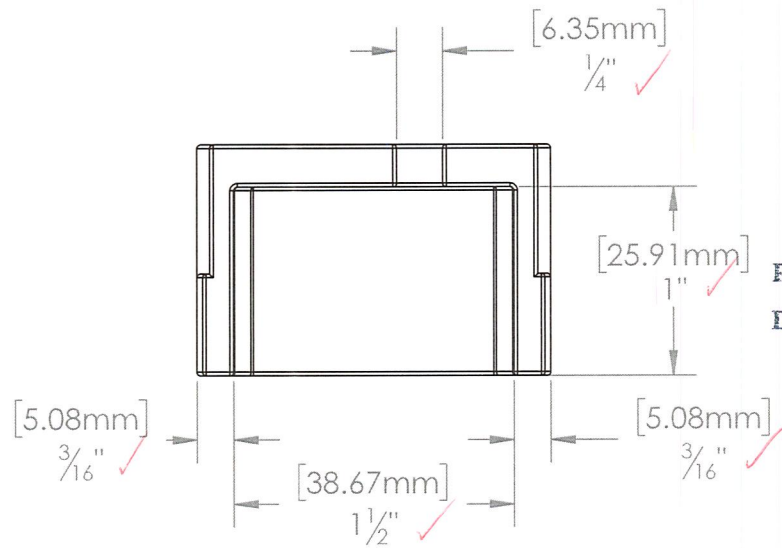
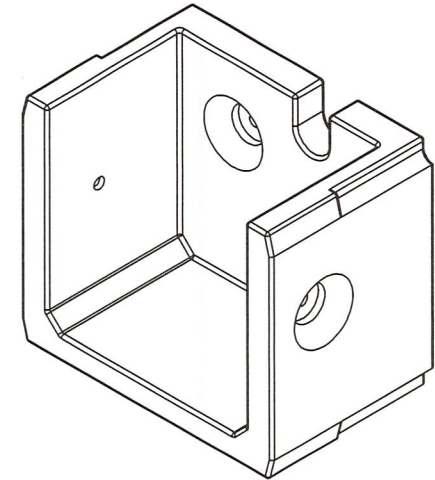
A	02/05/15	KF	Initial Drawing
REV	DATE	BY	DESCRIPTION
DESCRIPTION: AVANT VERTICAL CABLE ADJUSTABLE			
DATE:	07/01/2020	DIVISION:	OEM
ITEM #:	FILE NAME/PART #:		SCALE:
	X3931-09948A		AS SHOWN
			REV:
			A

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Date 8/6/20 Tech AJS



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Fortress Railing

1720 N 1st Street
Garland, Tx 75040

Sheet: 1 OF 1

B	7/29/2020	TF	Initial Drawing
REV	DATE	BY	DESCRIPTION

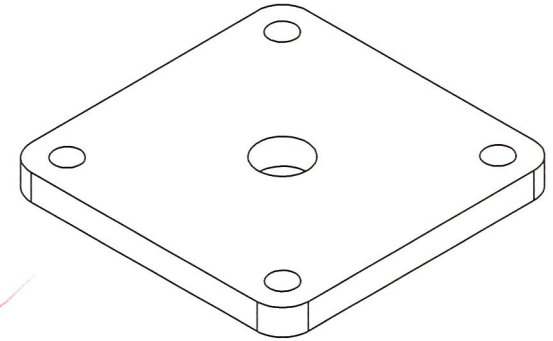
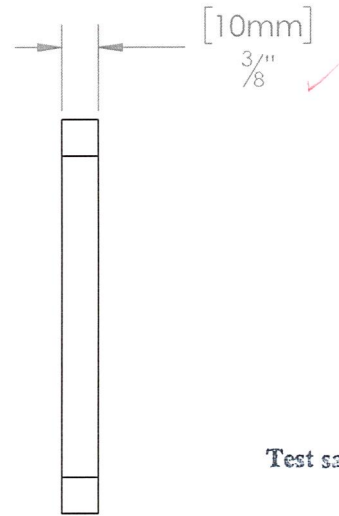
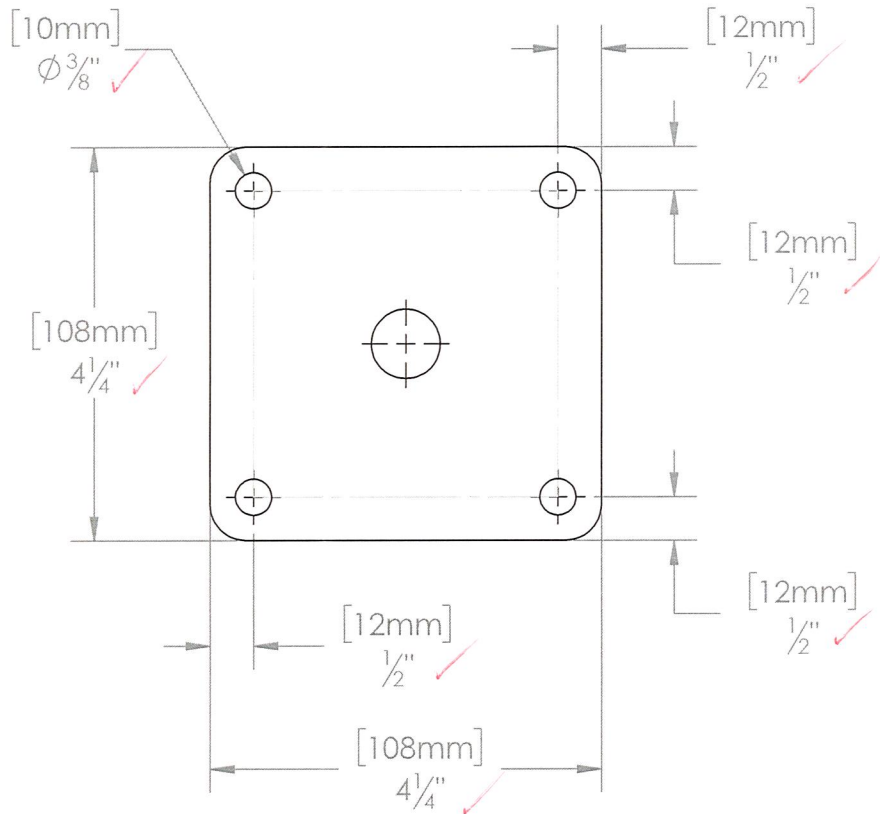
DESCRIPTION:
AVANT EXTERNAL BRACKET CUP

DRAWN BY: TylerF
DATE: 07/29/2020 DIVISION: OEM

SCALE:
AS SHOWN

ITEM #: FILE NAME/PART #:
Avant Level Bracket

REV:
B



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Test sample complies with these details.
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Report # L0293.01-119-19
Date 8/6/20 Tech ATJ

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Fortress Railing
1720 N 1st Street
Garland, Tx 75040

Sheet: 1 OF 1

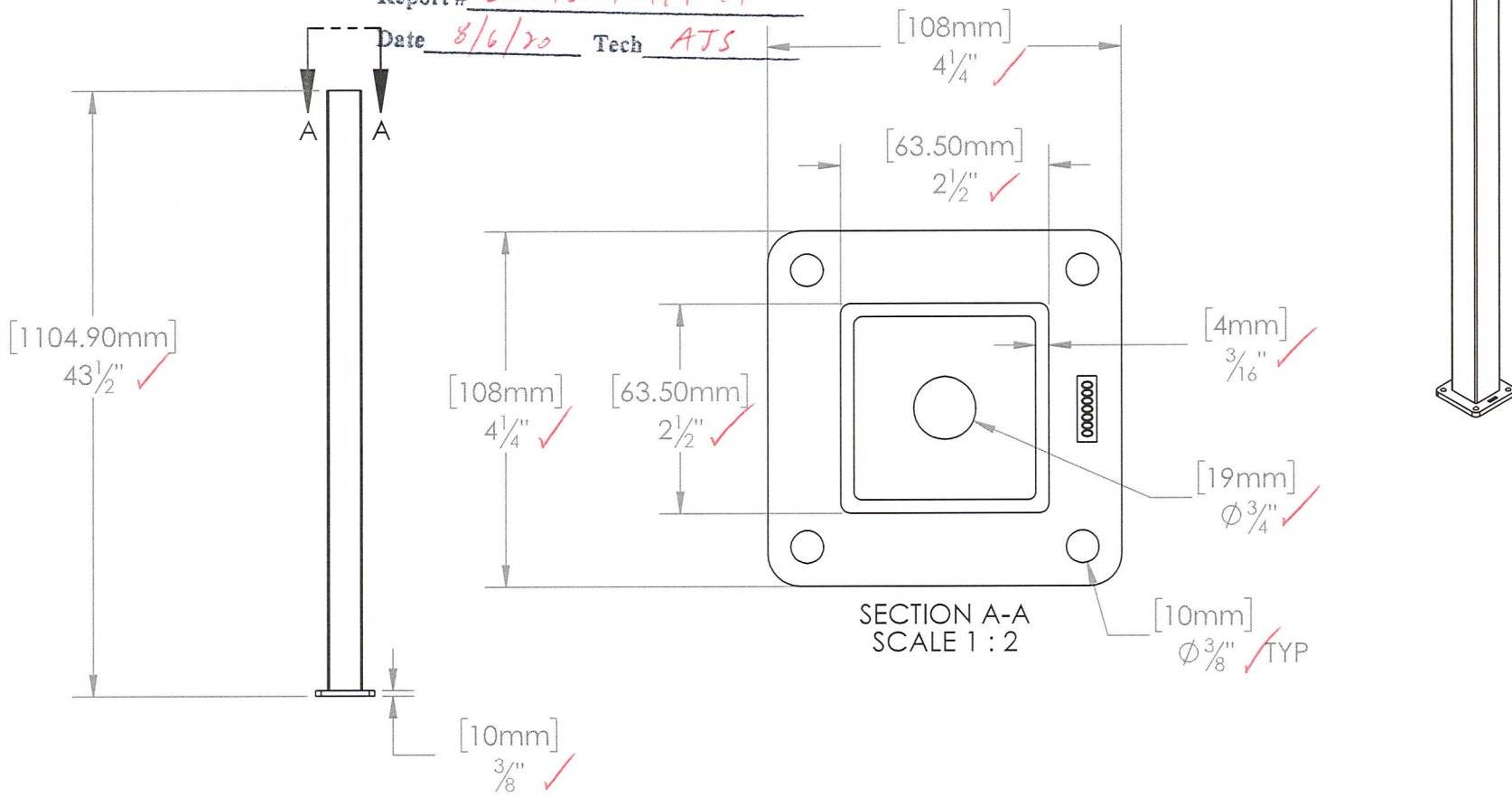
REV	DATE	BY	DESCRIPTION	SCALE:
A	7/29/2020	TF	Initial Drawing	AS SHOWN
DESCRIPTION:				
MENARDS 2.5" POST 4.25" BASE PLATE				
DRAWN BY: TylerF			DIVISION: OEM	
DATE: 07/29/2020			DIVISION: OEM	
ITEM #:	FILE NAME/PART #:			REV:
	Avant Post Base Plate			A

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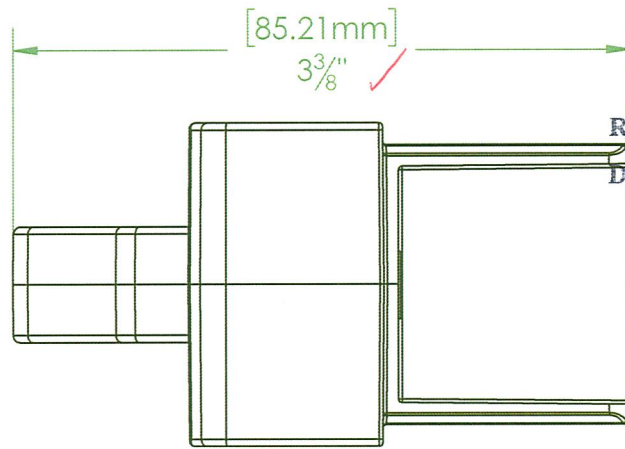


Fortress Railing
1720 N 1st Street
Garland, Tx 75040

Sheet: 1 OF 1

REV	DATE	BY	DESCRIPTION	SCALE:
A	7/29/2020	TF	Initial Drawing	AS SHOWN
DESCRIPTION:				
AVANT 2.5" X 43.5" POST WELDMENT				
DRAWN BY:		TYLER F		SCALE:
DATE:		07/29/2020		AS SHOWN
DIVISION:		OEM		REV:
ITEM #:	FILE NAME/PART #:			A
	Avant Post Mount			

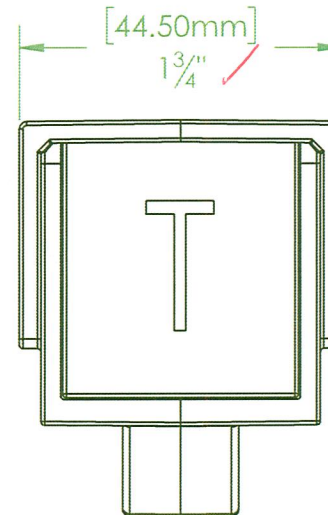
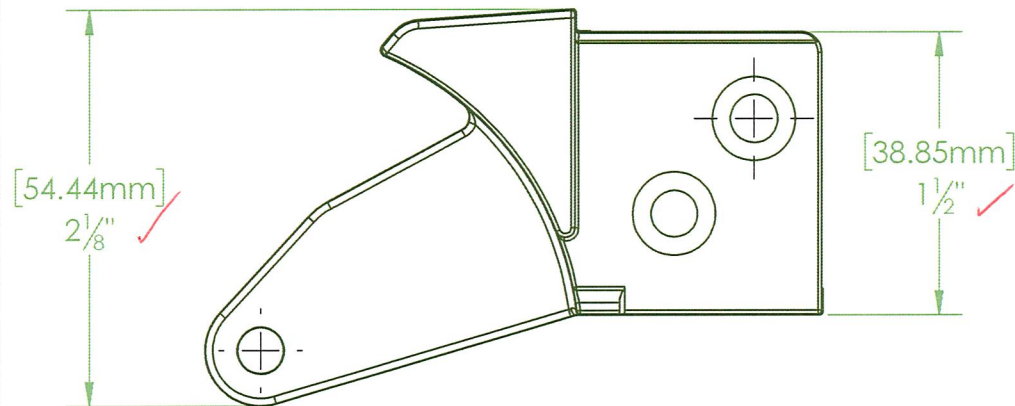
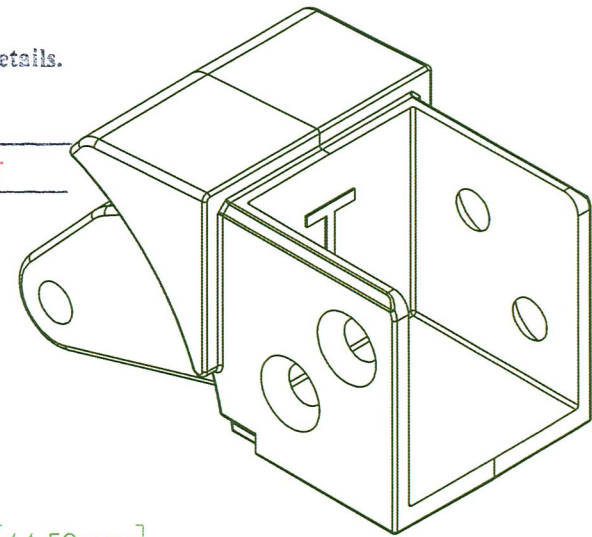
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Date 8/6/20 Tech AJS



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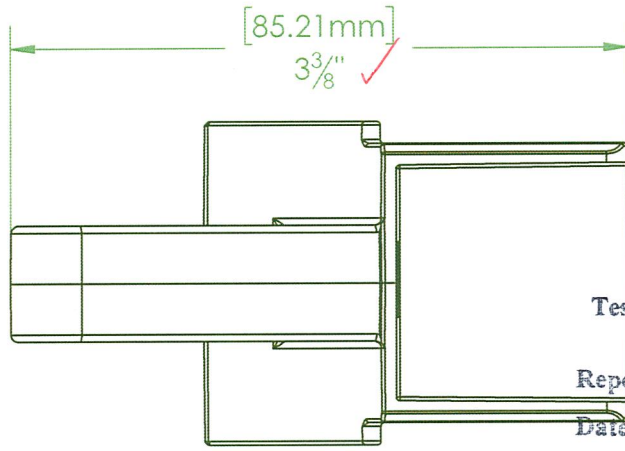


Fortress Railing

1720 N 1st Street
Garland, Tx 75040

Sheet: 1 OF 1

82	1/14/19	GL	Initial Drawing
REV	DATE	BY	DESCRIPTION
DESCRIPTION:			
FE26+ CR 05 STAIR BRACKET TOP RAIL			
DRAWN BY: KevinF			SCALE: 1:1
DATE: 01/14/2019			DIVISION:
ITEM #:	FILE NAME/PART #:		REV:
	R3734-05741A		8



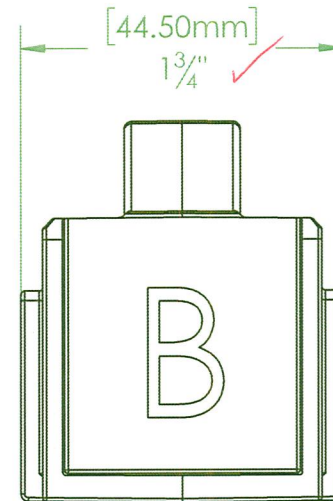
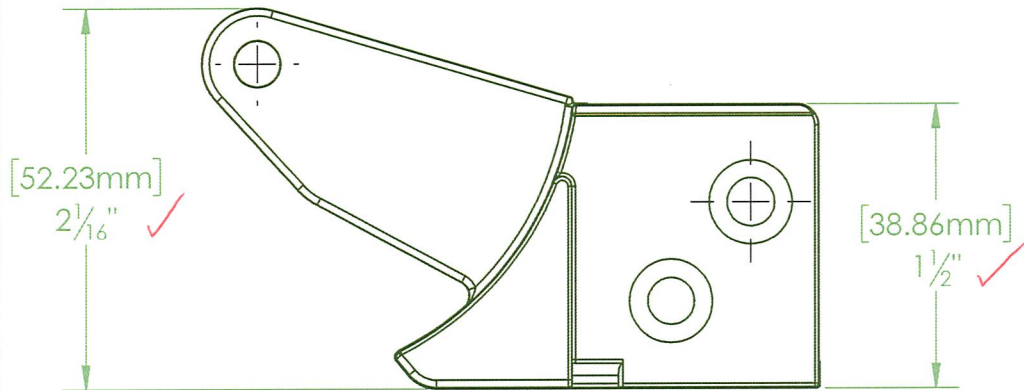
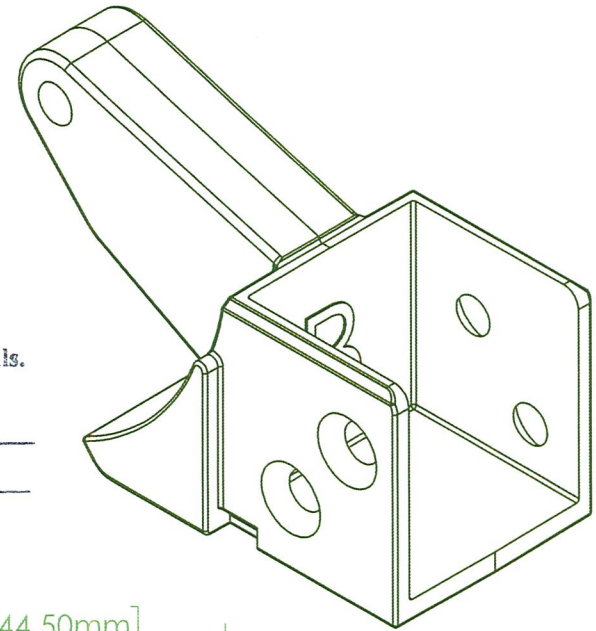
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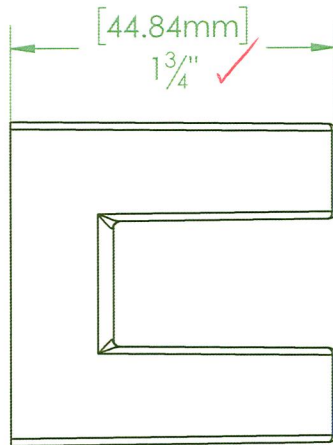


Fortress Railing

1720 N 1st Street
Garland, Tx 75040

Sheet: 1 OF 1

92	1/14/19	gl	Initial Drawing
REV	DATE	BY	DESCRIPTION
DESCRIPTION:			
FE26+ CR 05 STAIR BRACKET BOTTOM RAIL			
DRAWN BY: KevinF		SCALE: 1:1	
DATE: 01/14/2019		DIVISION:	
ITEM #:	FILE NAME/PART #:	REV:	
	R3734-05742A	9	

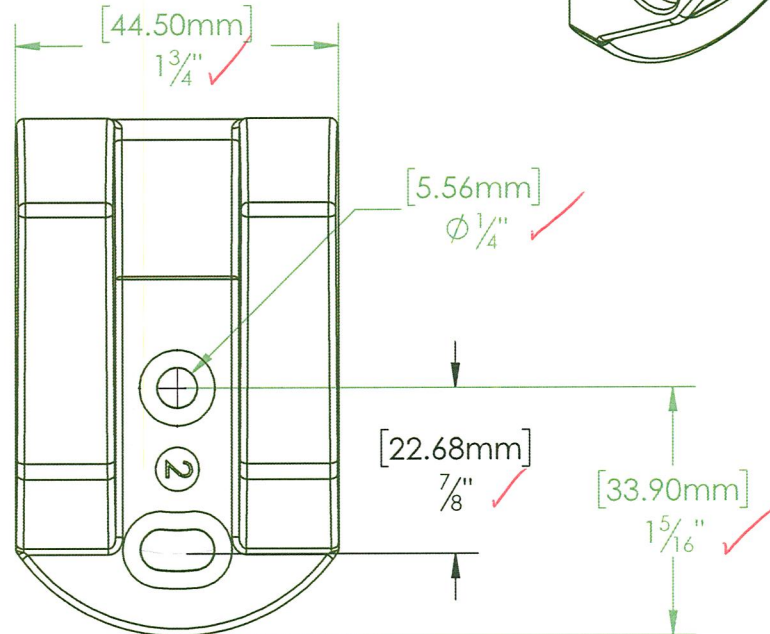
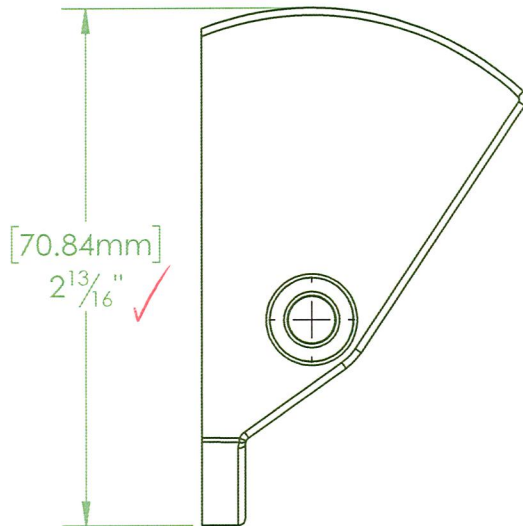
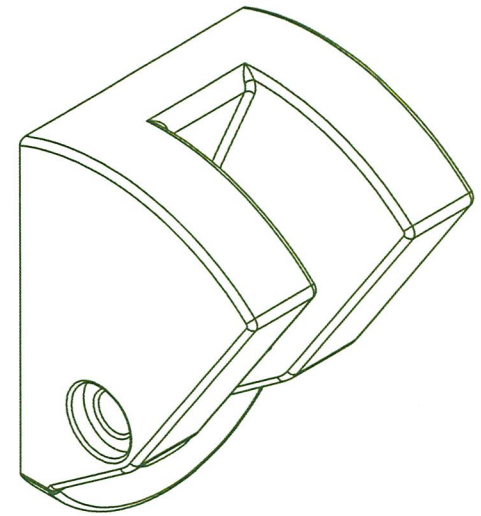


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Deviations are noted.

Report # L0793.01-119-19

Date 8/6/20 Tech AJS



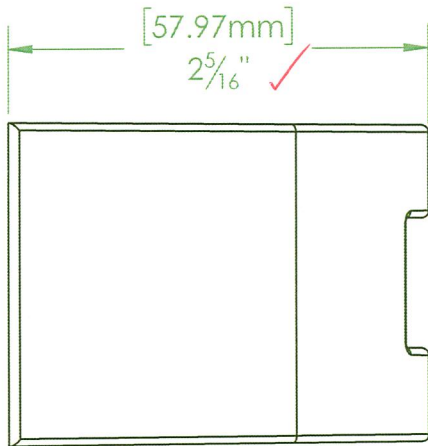
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Fortress Railing
1720 N 1st Street
Garland, Tx 75040

Sheet: 1 OF 1

62	1/14/19	GL	Initial Drawing
REV	DATE	BY	DESCRIPTION
DESCRIPTION: FE26+ CR 05 STAIR BRACKET POST SHORT			
DRAWN BY: KevinF			SCALE: 1:1
DATE: 01/14/2019		DIVISION:	
ITEM #:	FILE NAME/PART #: R3734-05743A		REV: 6

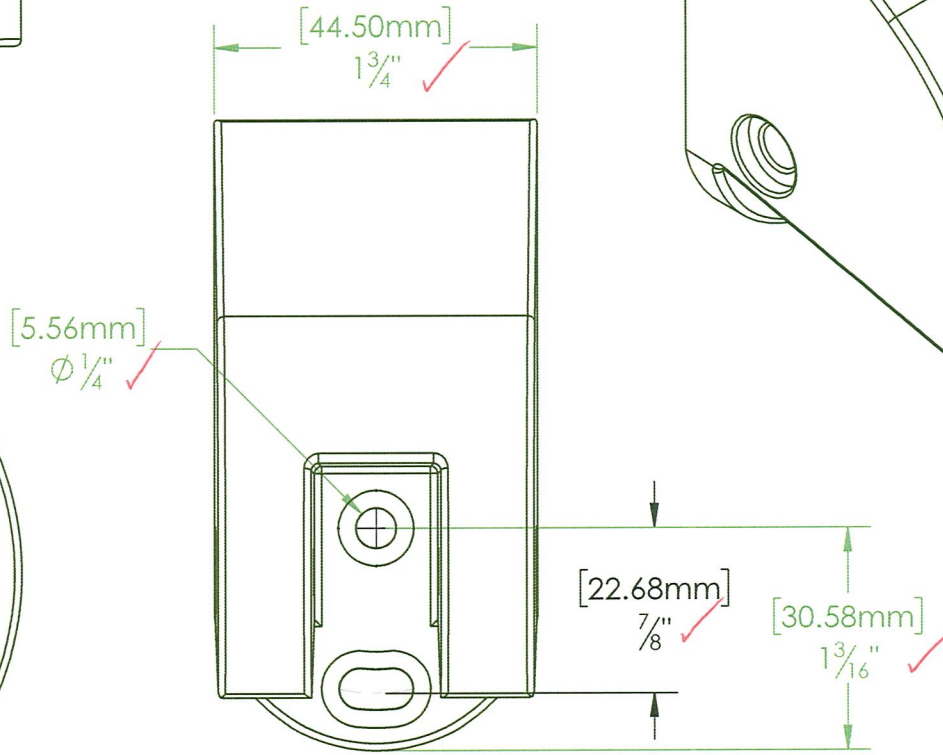
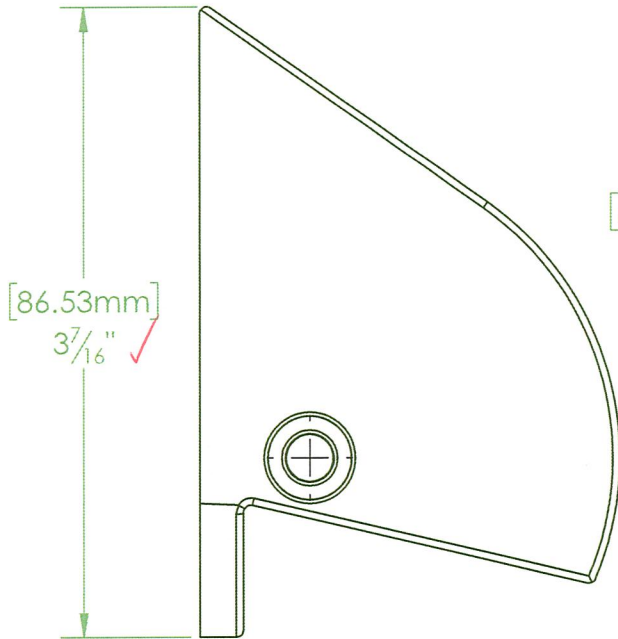
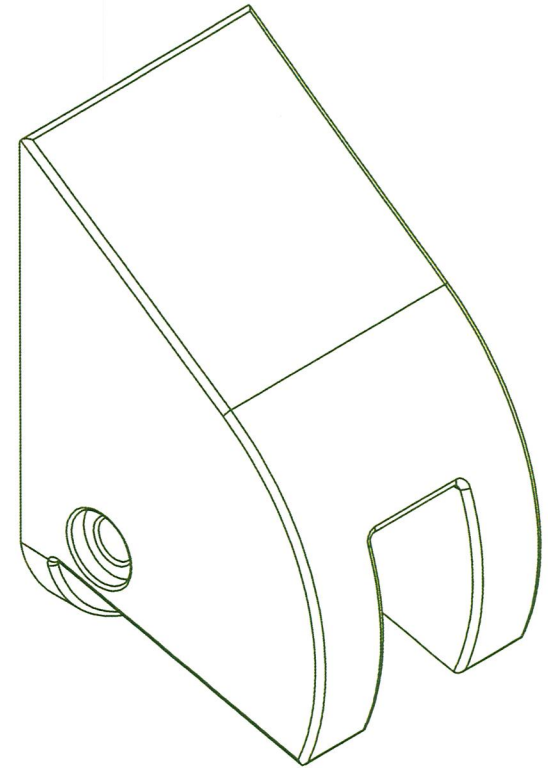


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Deviations are noted.

Report # L0793.01-119-19

Date 8/6/20 Tech AJS



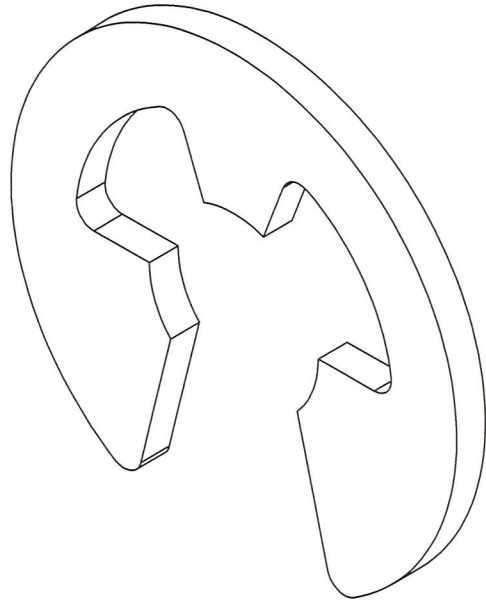
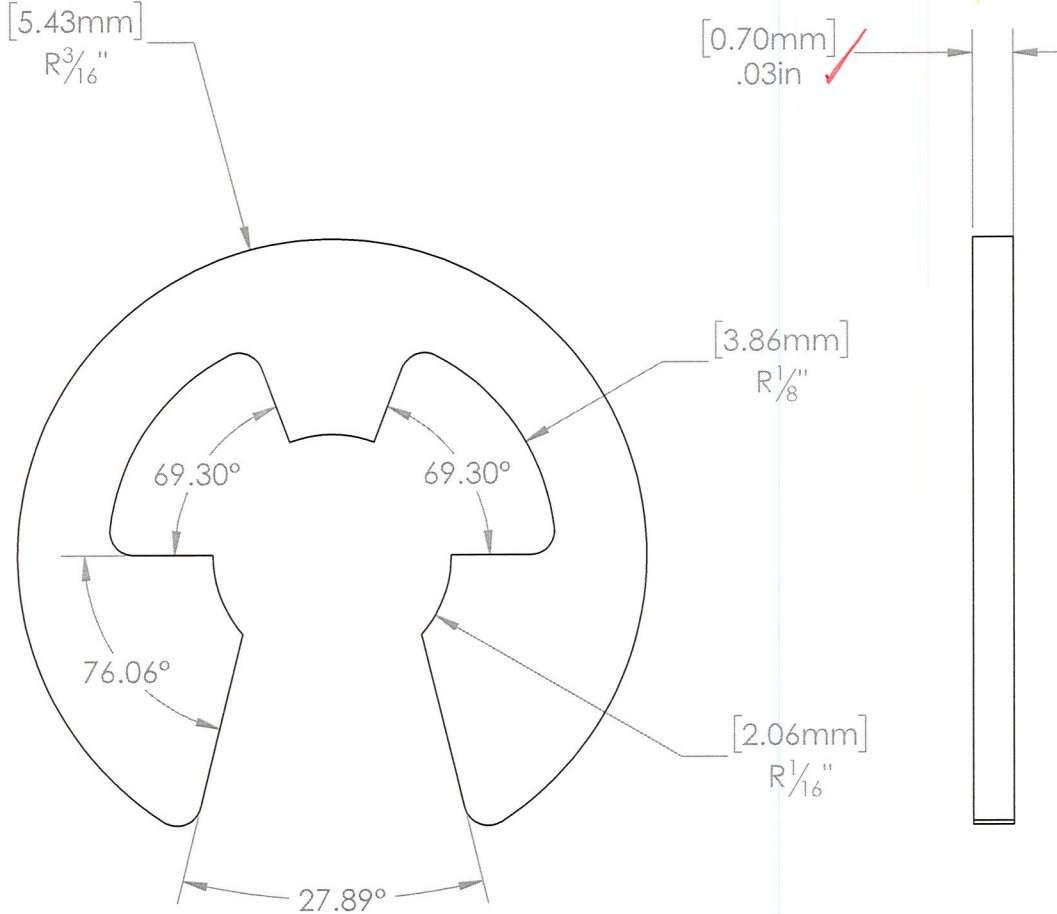
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72	1/14/19	GL	Initial Drawing
REV	DATE	BY	DESCRIPTION
DESCRIPTION:			
FE26+ CR 05 STAIR BRACKET POST LONG			
DRAWN BY: KevinF			SCALE:
DATE: 01/14/2019			1:1
DIVISION:			REV:
ITEM #: R3734-05744A			7



Fortress Railing
1720 N 1st Street
Garland, Tx 75040

Sheet: 1 OF 1



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Fortress Railing
1720 N 1st Street
Garland, Tx 75040

Sheet: 1 OF 1

6	7/29/2020	TF	Initial Drawing
REV	DATE	BY	DESCRIPTION
DESCRIPTION:			
CABLE RAIL-SIDE MOUNT EXTERNAL RETAINING RING			
DRAWN BY: TylerF		SCALE:	
DATE: 07/29/2020		AS SHOWN	
DIVISION: Fortress Rail			
ITEM #:	FILE NAME/PART #:	REV:	
	Bottom Cable Washer	6	



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TEST REPORT FOR FORTRESS BUILDING PRODUCTS

Report No.: L0293.01-119-19 R0

Date: 08/26/20

SECTION 13

REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	08/26/20	N/A	Original Report Issue