Intertek | Architectural Testing

TEST REPORT

Rendered to:

DECK SUPPLY SERVICES LLC

For:

***Savannah* Series Aluminum Guardrail System**

Report No.: G6139.01-119-19
Report Date: 01/17/17
Test Record Retention Date: 12/16/20

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TEST REPORT

G6139.01-119-19
January 10, 2017

TABLE OF CONTENTS

TEST REPORT

Rendered to:

DECK SUPPLY SERVICES LLC
3977 160th Street
Blue Grass, Iowa 52726

Report No.:	G6139.01-119-19
Test Dates:	12/15/16
Through:	12/16/16
Report Date:	01/17/17
Test Record Retention Date:	12/16/20

1.0 General Information

1.1 Product

8 ft by 42 in *Savannah* Guardrail System

1.2 Project Description

Architectural Testing, Inc., an Intertek company ("Intertek-ATI"), was contracted by Deck Supply Services LLC to perform structural testing on their 8 ft by 42 in *Savannah* Guardrail System. The purpose of the testing is preliminary evaluation in accordance with Section 4.2.1 of the following criteria:

> ICC-ES™ AC273 (March 1, 2008 - Editorial Revised March 2016), *Acceptance Criteria for Handrails and Guards*

ICC-ES™ AC273-08 was developed by the ICC Evaluation Service, Inc. (ICC-ES™) as acceptance criteria to evaluate compliance with the following building codes:

> 2015 *International Building Code*®, International Code Council
>
> 2015 International Residential Code®, International Code Council

1.3 Limitations

All tests performed were to evaluate structural performance of the railing assembly to carry and transfer imposed loads to the supports (posts). The test specimen evaluated included the pickets, rails, rail brackets, posts, and attachment to the supporting structure. Anchorage of support posts to the supporting structure is not included in the scope of this testing and would need to be evaluated separately.

Testing is limited to satisfying the IRC - One- and Two-Family Dwellings requirements of ICC-ES™ AC273.

Testing conducted and reported herein addresses an in-line assembly condition only and does not address a corner condition assembly.

Material grade/alloy information reported herein was provided by Deck Supply Services LLC and was not verified by Certificates of Conformance or tensile testing.

1.4 Qualifications

Intertek-ATI in York, Pennsylvania has demonstrated compliance with ISO/IEC International Standard 17025 and is consequently accredited as a Testing Laboratory (TL-144) by International Accreditation Service, Inc. (IAS).

1.5 Product Description

The *Savannah* guardrail system is comprised of aluminum rails, pickets and posts. Drawings are included in Appendix A to verify the overall dimensions and other pertinent information of the tested product, its components, and any constructed assemblies.

1.6 Product Sampling

All components utilized for testing reported herein were provided to Intertek-ATI by Deck Supply Services LLC and were not sampled by an independent inspection agency.

1.7 Witnessing

There were no witnesses from Deck Supply Services LLC present for testing conducted and reported herein.

1.8 Conditions of Testing

Unless otherwise indicated, all testing reported herein was conducted in a laboratory set to maintain temperature in the range of 68 ± 4ºF and humidity in the range of 50 ± 5% RH.

2.0 Structural Performance Testing of Assembled Railing Systems

Re: ICC-ES™ AC273 - Section 4.2.1

2.1 General

Railing assemblies were tested in a self-contained structural frame designed to accommodate anchorage of a rail assembly and application of the required test loads. The specimen was 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 specimen. Applied load was measured using an electronic load cell located in-line with the loading system. Deflections were measured to the nearest 0.01 in using electronic linear displacement transducers.

2.2 Railing Assembly Description

The *Savannah* guardrail system consisted of aluminum top and bottom rails with spaced pickets between the rail members. The railing systems had an overall top rail length (inside of post to inside of post) of 95-1/2 in with an overall rail height (top of top rail to bottom of bottom rail) of 41 in. Top and bottom rails attached to aluminum post mounts via cast aluminum collar brackets with snap covers. See Section 2.3 Fastening Schedule for connection details. A support block was located at the midspan of the bottom rail and was attached according to Section 2.3 Fastening Schedule. See drawings in Appendix A and photographs in Appendix B for additional details.

2.3 Fastening Schedule

Connection	Fastener
Rail Bracket to Post	Two #8-18 by 3/4" (0.117 in minor diameter) pan-head, square drive, self-drilling sheet metal screws
Rail Bracket to Rail	One #8-18 by 3/4" (0.117 in minor diameter) pan-head, square drive, self-drilling sheet metal screws
Baluster Connector to Rail	One #8-18 by 3/4" (0.117 in minor diameter) pan-head, square drive, self-drilling sheet metal screws
Baluster / Support Block to Baluster Connector	Slip fit – No mechanical connection
Post Mount to Substructure	Four 3/8 in Grade 5 hex-head bolts with washer

2.4 Series / Model

The test specimen components were supplied by Deck Supply Services LLC and were assembled by a representative of Intertek-ATI.

Top Rail: 1-9/16 in high by 1-7/16 in wide by 0.08 in wall by 95 in long contoured extruded 6005-T5 aluminum rail

Bottom Rail: 1 in high by 1-7/16 in wide by 0.08 in wall by 95 in long contoured extruded 6005-T5 aluminum rail

Brackets: Cast 6005-T5 aluminum socket brackets with snap covers contoured to the shape of the rail

Balusters: 3/4 in square by 0.04 in wall by 38-1/2 in long extruded 6005-T5 aluminum with 3-3/4 in clear space between pickets

Baluster Connectors: 0.66 in diameter by 0.68 in high HDPE plug

Support Block: Section of 3/4 in square by 0.04 in wall extruded 6005-T5 aluminum picket cut to length and secured to the center of the underside of the bottom rail using a baluster connector plug attached to the bottom rail as described in Section 2.3 Fastening Schedule.

Post: 3-1/2 in square by 0.085 in wall extruded 6005-T5 aluminum post welded to 5-7/16 in square by 5/16 in thick 6005-T5 aluminum base plate with four 7/16 in diameter by 1/2 in long slotted holes located approximately 1/2 in on-center in from each edge and 4-7/16 in apart on-center and a 1/4 in diameter hole located in the center of the plate - the continuous fillet weld connecting the tube to the base plate ranged from 1/4 in to 5/16 in - the base plate was attached to the surface of a rigid steel test surface (simulated concrete) as described in Section 2.3 Fastening Schedule.

See drawings in Appendix A and photographs in Appendix B for additional details.

2.5 Test Setup

The railing 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 railing was assembled by an Intertek-ATI technician. Transducers mounted to an independent reference frame were located to record movement of reference points on the railing system components (ends and mid-point) to determine net component deflections. See photographs in Appendix B for test setups.

2.6 Test Procedure

Testing and evaluation was performed in accordance with Section 4.2.1 of ICC-ES™ AC273. The 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. One specimen was used for all load tests which were performed in the order reported. Each design load test was performed using the following procedure:

1. Zeroed transducers and load cell at zero load;
2. Increased load to specified test load in no less than ten seconds; and
3. Held test load for no less than one minute.

2.7 Test Results

Unless otherwise noted, all loads and displacement measurements were normal to the rail (horizontal). The test results apply only to the railing assembly between supports and anchorage to the support.

Key to Test Results Tables:

Load Level: Target test load

Test Load: Actual applied load at the designated load level (target). Where more than one value is reported, the test load was the range (min. - max.) that was held during the time indicated in the test.

Elapsed Time (E.T.): The amount of time into the test with zero established at the beginning of the loading procedure. Where more than one value is reported, the time was the range (start-end) that the designated load level was reached and sustained.

95-1/2 in by 42 in *Savannah* Level Guardrail (In-Line Application)
Limited to Use in IRC - One- and Two-Family Dwellings / ICC-ES™ AC273

Specimen No. 1 of 3

Test No. 1 - Test Date: 12/15/16 **Design Load: 50 lb / 1 Square ft of In-Fill at Center of Two Pickets**			
Load Level	**Test Load (lb)**	**E.T. (min:sec)**	**Result**
125 lb (2.50 x D.L.)	126 - 129	00:20 - 01:26	Sustained load equal to or greater than 125 lb for one full minute without failure

2.7 Test Results (Continued)

Specimen No. 1 of 3 (Continued)

Test No. 2 - Test Date: 12/15/16 **Design Load: 50 lb / 1 Square ft of In-Fill at Bottom of Two Pickets**			
Load Level	**Test Load (lb)**	**E.T. (min:sec)**	**Result**
125 lb (2.50 x D.L.)	125 - 130	00:39 - 01:41	Sustained load equal to or greater than 125 lb for one full minute without failure

Test No. 3 - Test Date: 12/15/16 **Design Load: 200 lb Concentrated Load at Mid-Span of Top Rail**						
Load Level	**Test Load (lb)**	**E.T. (min:sec)**	**Displacement (in)**			
			End	**Mid**	**End**	**Net [1]**
200 lb (D.L.)	200	00:42	0.28	2.33	0.25	2.07
500 lb (2.50 x D.L.)	500 - 508	01:17 - 02:20	**Result**: Withstood load equal to or greater than 500 lb for one full minute without failure			
Deflection Evaluation: Maximum rail deflection at 200 lb = 2.07 in on an 8 ft rail (95.5 in) Limits per AC273[2]: $\left(\frac{h}{24}+\frac{l}{96}\right)=\left(\frac{36}{24}+\frac{95.5}{96}\right)=2.49">2.07"\therefore ok$ and $\frac{h}{12}=\frac{36}{12}=3.00">2.07"\therefore ok$						

[1] *Each end displacement was measured at the center of the support. Net displacement was the rail displacement relative to the supports.*

[2] *Deflection limit calculation based on worse case 36" railing height to satisfy One- and Two-Family Dwelling requirements.*

Test No. 4 - Test Date: 12/15/16 **Design Load: 200 lb Concentrated Load at Both Ends of Top Rail (Brackets)**			
Load Level [1]	**Test Load (lb)**	**E.T. (min:sec)**	**Result**
1000 lb (2.50 x D.L.) x 2	1000 - 1008	00:46 - 01:51	Each end withstood load equal to or greater than 500 lb for one full minute without failure

[1] *Load was imposed on* both *ends of rail using a spreader beam; therefore, loads were doubled.*

2.7 Test Results (Continued)

Specimen No. 1 of 3 (Continued)

Test No. 5 - Test Date: 12/15/16 **Design Load: 200 lb Concentrated Load at Top of Post Mount (42 in High)** **Installed in Simulated Concrete**			
Load Level	**Test Load (lb)**	**E.T. (min:sec)**	**Displacement (in)**
200 lb (D.L.)	201	00:32	0.47
500 lb (2.50 x D.L.)	501 - 509	00:52 - 01:55	**Result**: Withstood load equal to or greater than 500 lb for one full minute without failure
Deflection Evaluation: Maximum post deflection at 201 lb = 0.47 in on a 42 in high post Limits per AC273 [1]: $\left(\frac{h}{24}+\frac{l}{96}\right)=\left(\frac{36}{24}+\frac{95.5}{96}\right)=2.49">0.47"\therefore ok$ and $\frac{h}{12}=\frac{36}{12}=3.0">0.47"\therefore ok$			

[1] *Deflection limit calculation based on worse case 36" railing height to satisfy One- and Two-Family Dwelling requirements.*

Test No. 6 - Test Date: 12/15/16 **Design Load: 200 lb Concentrated Load at Top of Post Mount (42 in High)** **Installed in Simulated Concrete**			
Load Level	**Test Load (lb)**	**E.T. (min:sec)**	**Displacement (in)**
200 lb (D.L.)	201	00:22	0.45
500 lb (2.50 x D.L.)	501 - 507	00:43 - 01:48	**Result**: Withstood load equal to or greater than 500 lb for one full minute without failure
Deflection Evaluation: Maximum post deflection at 201 lb = 0.45 in on a 42 in high post Limits per AC273 [1]: $\left(\frac{h}{24}+\frac{l}{96}\right)=\left(\frac{36}{24}+\frac{95.5}{96}\right)=2.49">0.45"\therefore ok$ and $\frac{h}{12}=\frac{36}{12}=3.0">0.45"\therefore ok$			

[1] *Deflection limit calculation based on worse case 36" railing height to satisfy One- and Two-Family Dwelling requirements.*

2.7 Test Results (Continued)

Specimen No. 2 of 3

Test No. 1 - Test Date: 12/16/16 **Design Load: 50 lb / 1 Square ft of In-Fill at Center of Two Pickets**			
Load Level	**Test Load (lb)**	**E.T. (min:sec)**	**Result**
125 lb (2.50 x D.L.)	125 - 129	00:30 - 01:35	Sustained load equal to or greater than 125 lb for one full minute without failure

Test No. 2 - Test Date: 12/16/16 **Design Load: 50 lb / 1 Square ft of In-Fill at Bottom of Two Pickets**			
Load Level	**Test Load (lb)**	**E.T. (min:sec)**	**Result**
125 lb (2.50 x D.L.)	126 - 129	00:22 - 01:26	Sustained load equal to or greater than 125 lb for one full minute without failure

Test No. 3 - Test Date: 12/16/16 **Design Load: 200 lb Concentrated Load at Mid-Span of Top Rail**						
Load Level	**Test Load (lb)**	**E.T. (min:sec)**	**Displacement (in)**			
			End	**Mid**	**End**	**Net [1]**
200 lb (D.L.)	200	00:45	0.25	2.44	0.24	2.20
500 lb (2.50 x D.L.)	500 - 507	01:35 - 02:40	**Result**: Withstood load equal to or greater than 500 lb for one full minute without failure			
Deflection Evaluation: Maximum rail deflection at 200 lb = 2.20 in on an 8 ft rail (95.5 in) Limits per AC273[2]: $\left(\frac{h}{24}+\frac{l}{96}\right)=\left(\frac{36}{24}+\frac{95.5}{96}\right)=2.49">2.20"\therefore ok$ and $\frac{h}{12}=\frac{36}{12}=3.00">2.20"\therefore ok$						

[1] *Each end displacement was measured at the center of the support. Net displacement was the rail displacement relative to the supports.*

[2] *Deflection limit calculation based on worse case 36" railing height to satisfy One- and Two-Family Dwelling requirements.*

2.7 Test Results (Continued)

Specimen No. 2 of 3 (Continued)

Test No. 4 - Test Date: 12/16/16 **Design Load: 200 lb Concentrated Load at Both Ends of Top Rail (Brackets)**			
Load Level [1]	**Test Load (lb)**	**E.T. (min:sec)**	**Result**
1000 lb (2.50 x D.L.) x 2	1000 - 1009	00:38 - 01:41	Each end withstood load equal to or greater than 500 lb for one full minute without failure

[1] *Load was imposed on* both *ends of rail using a spreader beam; therefore, loads were doubled.*

Test No. 5 - Test Date: 12/16/16 **Design Load: 200 lb Concentrated Load at Top of Post Mount (42 in High)** **Installed in Simulated Concrete**			
Load Level	**Test Load (lb)**	**E.T. (min:sec)**	**Displacement (in)**
200 lb (D.L.)	201	00:28	0.42
500 lb (2.50 x D.L.)	500 - 509	00:53 - 01:58	**Result**: Withstood load equal to or greater than 500 lb for one full minute without failure
Deflection Evaluation: Maximum post deflection at 201 lb = 0.42 in on a 42 in high post Limits per AC273 [1]: $\left(\frac{h}{24}+\frac{l}{96}\right)=\left(\frac{36}{24}+\frac{95.5}{96}\right)=2.49">0.42"\therefore ok$ and $\frac{h}{12}=\frac{36}{12}=3.0">0.42"\therefore ok$			

[1] *Deflection limit calculation based on worse case 36" railing height to satisfy One- and Two-Family Dwelling requirements.*

2.7 Test Results (Continued)

Specimen No. 3 of 3

Test No. 1 - Test Date: 12/16/16 **Design Load: 50 lb / 1 Square ft of In-Fill at Center of Two Pickets**			
Load Level	**Test Load (lb)**	**E.T. (min:sec)**	**Result**
125 lb (2.50 x D.L.)	125 - 129	00:30 - 01:33	Sustained load equal to or greater than 125 lb for one full minute without failure

Test No. 2 - Test Date: 12/16/16 **Design Load: 50 lb / 1 Square ft of In-Fill at Bottom of Two Pickets**			
Load Level	**Test Load (lb)**	**E.T. (min:sec)**	**Result**
125 lb (2.50 x D.L.)	125 - 130	00:30 - 01:34	Sustained load equal to or greater than 125 lb for one full minute without failure

Test No. 3 - Test Date: 12/16/16 **Design Load: 200 lb Concentrated Load at Mid-Span of Top Rail**						
Load Level	**Test Load (lb)**	**E.T. (min:sec)**	**Displacement (in)**			
			End	**Mid**	**End**	**Net [1]**
200 lb (D.L.)	200	00:33	0.27	2.44	0.26	2.18
500 lb (2.50 x D.L.)	500 - 506	01:11 - 02:16	**Result**: Withstood load equal to or greater than 500 lb for one full minute without failure			
Deflection Evaluation: Maximum rail deflection at 200 lb = 2.18 in on an 8 ft rail (95.5 in) Limits per AC273[2]: $\left(\frac{h}{24}+\frac{l}{96}\right)=\left(\frac{36}{24}+\frac{95.5}{96}\right)=2.49">2.18"\therefore ok$ and $\frac{h}{12}=\frac{36}{12}=3.00">2.18"\therefore ok$						

[1] Each end displacement was measured at the center of the support. Net displacement was the rail displacement relative to the supports.

[2] Deflection limit calculation based on worse case 36" railing height to satisfy One- and Two-Family Dwelling requirements.

2.7 Test Results (Continued)

Specimen No. 3 of 3 (Continued)

Test No. 4 - Test Date: 12/16/16 **Design Load: 200 lb Concentrated Load at Both Ends of Top Rail (Brackets)**			
Load Level [1]	**Test Load (lb)**	**E.T. (min:sec)**	**Result**
1000 lb (2.50 x D.L.) x 2	1000 - 1011	00:43 - 01:49	Each end withstood load equal to or greater than 500 lb for one full minute without failure

[1] *Load was imposed on* both *ends of rail using a spreader beam; therefore, loads were doubled.*

2.8 Summary and Conclusions

When installed between adequate supports, the railing assemblies reported herein meet the structural performance requirements of Section 4.2.1 of ICC-ES™ AC273 for use in One- and Two-Family Dwellings (IRC).

Anchorage of support posts to the supporting structure is not included in the scope of this testing and would need to be evaluated separately.

3.0 Closing Statement

Intertek-ATI will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Intertek-ATI for the entire test record retention period.

Results obtained are tested values and were secured using the designated test methods. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimens tested. This report may not be reproduced, except in full, without the written approval of Intertek-ATI.

For INTERTEK-ATI:

Digitally Signed by: Adam J. Schrum

Adam J. Schrum
Lead Technician

Digitally Signed by: Virgal Thomas Mickley, Jr.

V. Thomas Mickley, Jr., P.E.
Senior Staff Engineer

AJS:vtm/jas

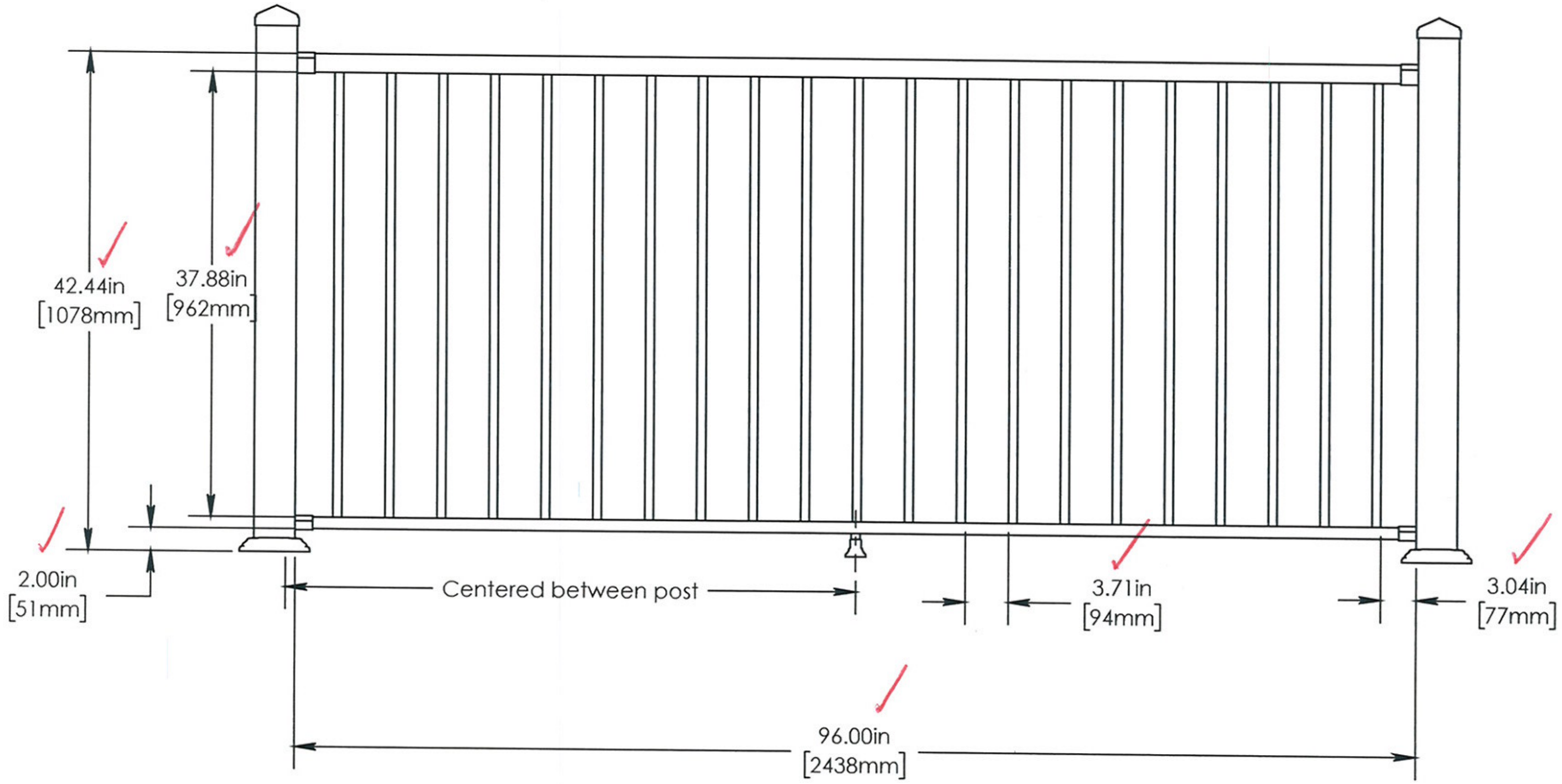
Attachments (pages): This report is complete only when all attachments listed are included.
- Appendix A - Drawings (10)
- Appendix B - Photographs (4)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	01/17/17	N/A	Original report issue

APPENDIX A

Drawings



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report # G6139.01-19-19

Date 1/9/17 Tech AJs

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	DRAWN	NJC	12/23/2016
	JOB #		
MATERIAL	COMMENTS:		
QUANTITY			
DO NOT SCALE DRAWING			

PREFERRED RAILING

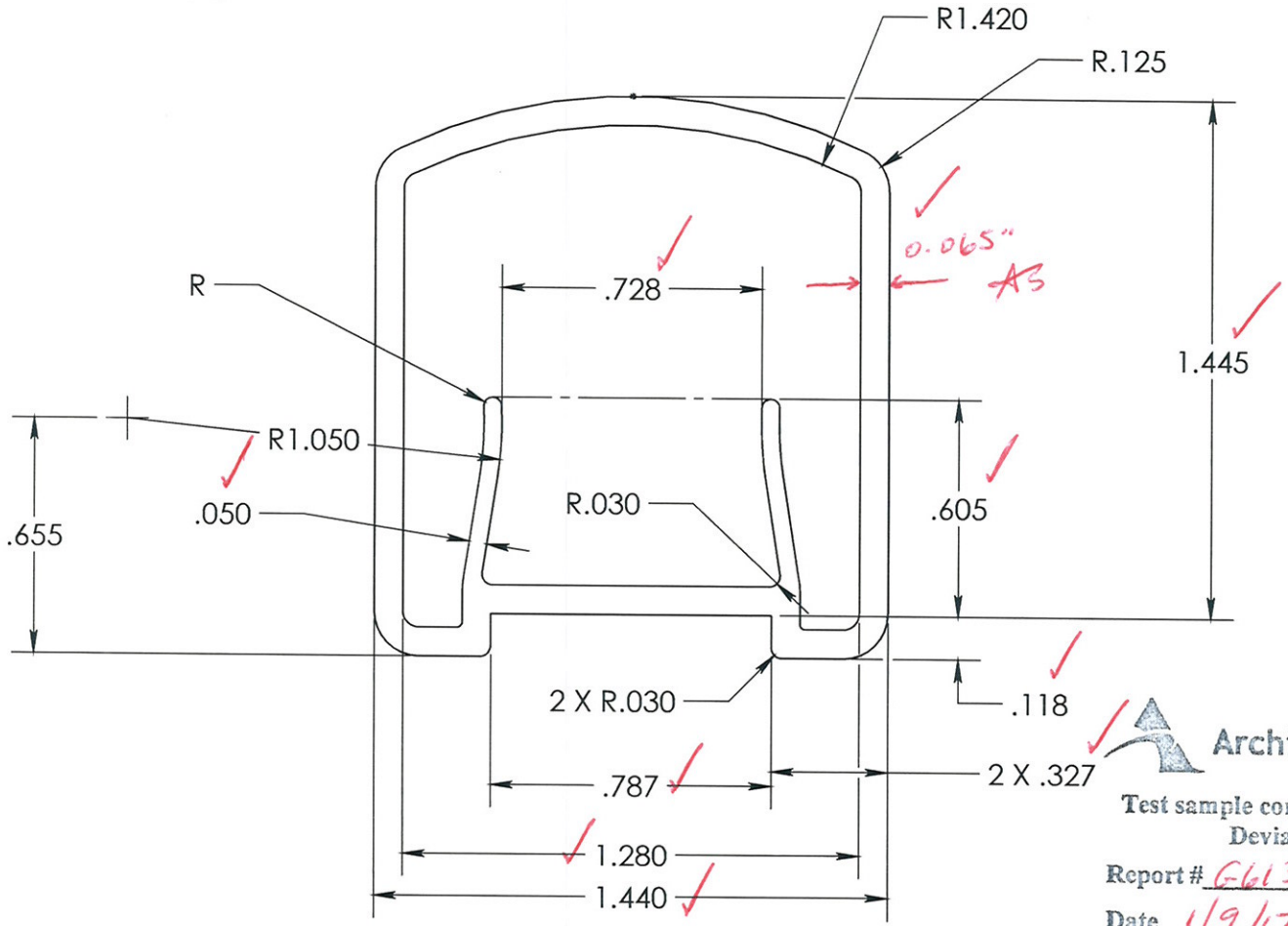
TITLE:

SIZE	DWG. NO.	REV
A	Savanna Rail Kit 8 ft	

SCALE: 1:15 | WEIGHT: | SHEET 1 OF 1

5 4 3 2 1

NOTES:
1. WALL THICKNESS IS ~~.080~~ 0.065" AS UNLESS OTHERWISE SPECIFIED



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report # G6139.01-119-19

Date 1/9/17 Tech AJS

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	DRAWN	NJC	1/8/2017
	JOB #		
MATERIAL 6005-T5	COMMENTS:		
QUANTITY			
DO NOT SCALE DRAWING			

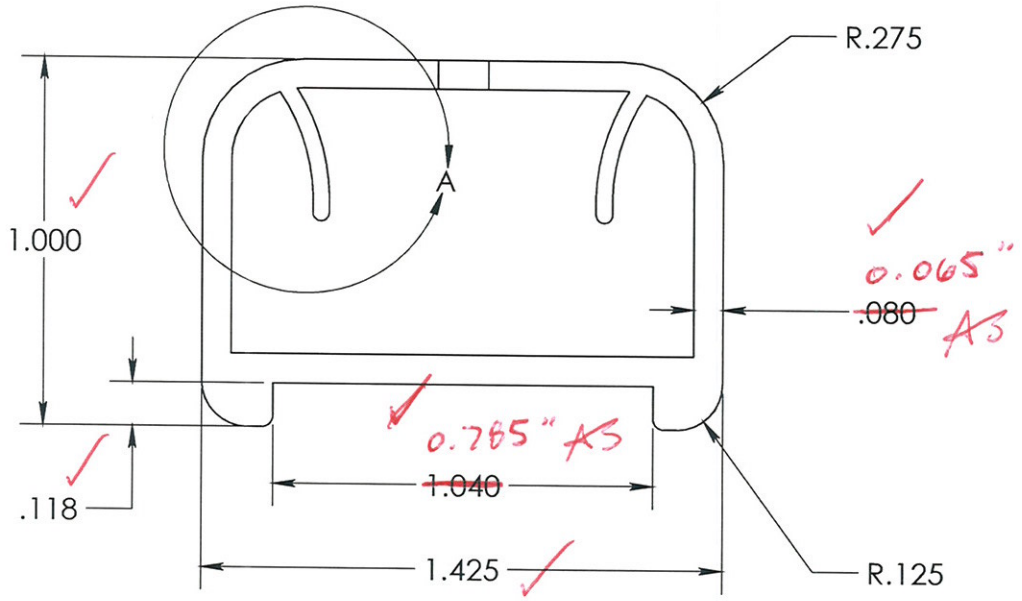
PREFERRED RAILING

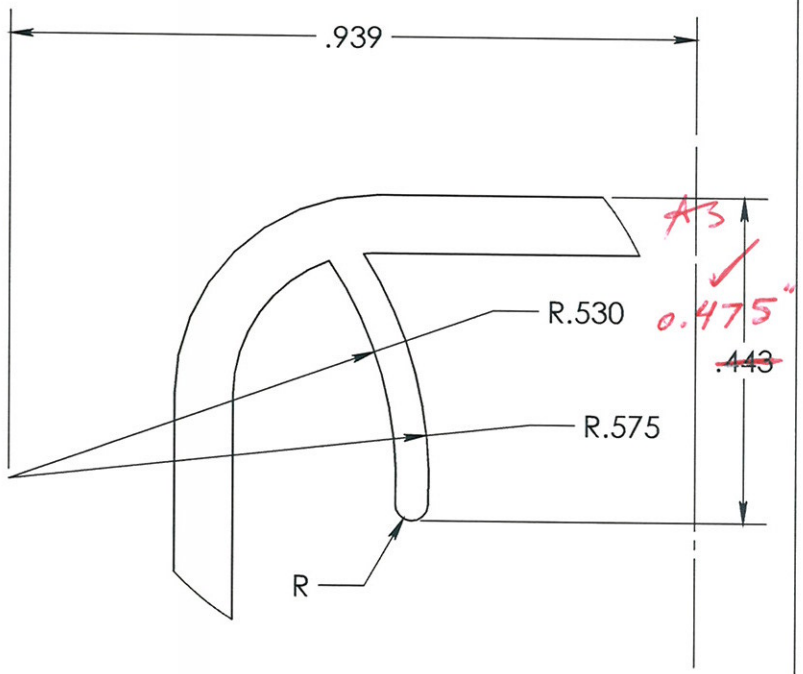
TITLE: SAVANNA TOP RAIL

SIZE	DWG. NO.	REV
A	Savanna Top Rail	

SCALE: 2:1 | WEIGHT: | SHEET 1 OF 1

5 4 3 2 1





DETAIL A
SCALE 4 : 1

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report # G6139.01-119-19

Date 1/9/17 Tech AJS

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	DRAWN	NJC	1/8/2017
	JOB #		
	COMMENTS:		
MATERIAL 6005-T5			
QUANTITY			
DO NOT SCALE DRAWING			

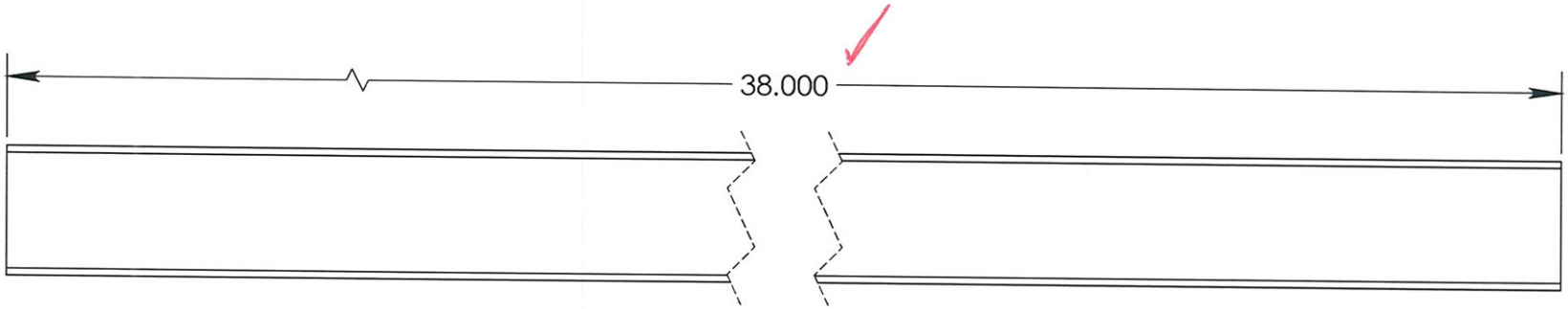
PREFERRED RAILING

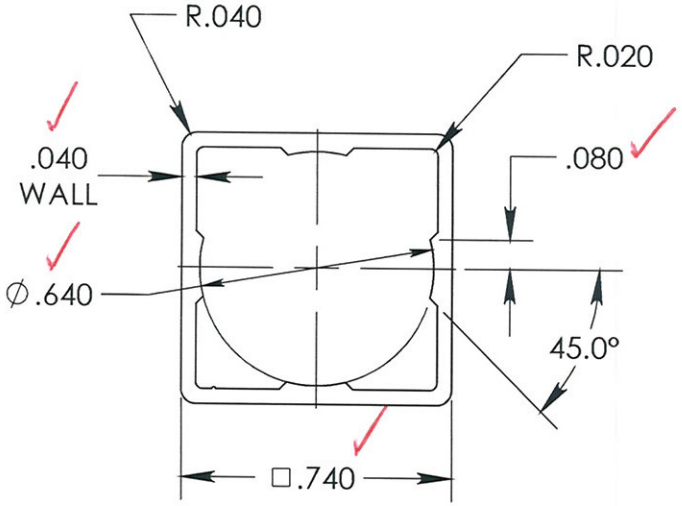
TITLE:

SAVANNA BOTTOM RAIL

SIZE	DWG. NO.	REV
A	Savanna Bottom Rail	
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

5 4 3 2 1





Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report # G6139.01-119-19

Date 1/9/17 Tech AJS

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	DRAWN	NJC	1/8/2017
	JOB #		
MATERIAL 6005-T5	COMMENTS:		
QUANTITY			
DO NOT SCALE DRAWING			

PREFERRED RAILING

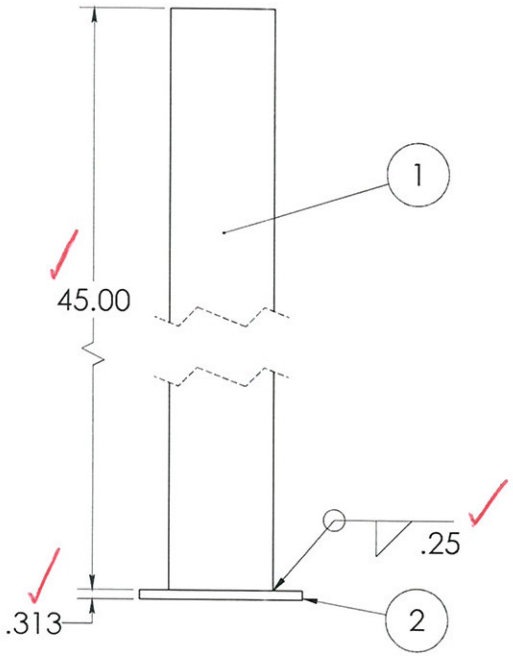
TITLE:
Preferred .75" square Baluster
Savanna Commercial Level Rail

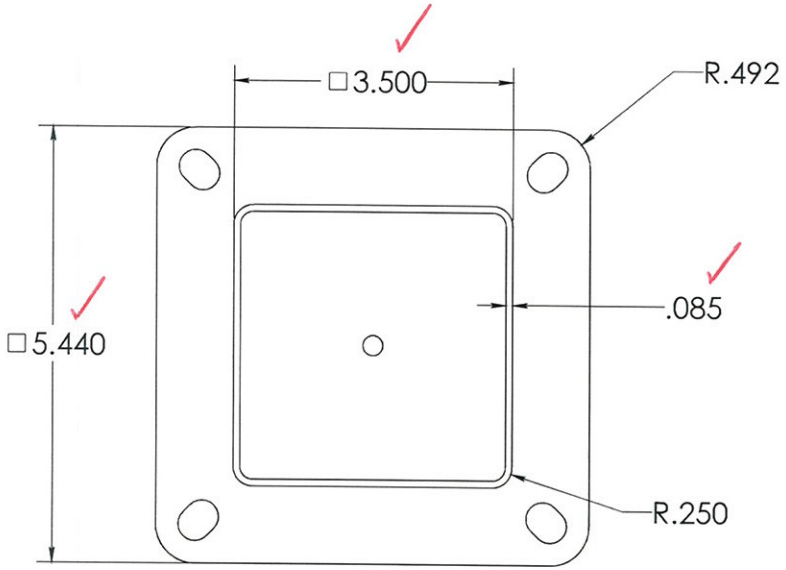
SIZE	DWG. NO.	REV
A	P-B-.75x38	A

SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

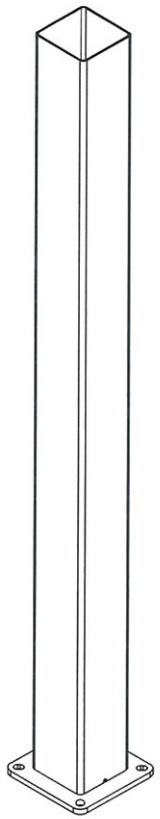
5 4 3 2 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	3.5 in. post	45" Commercial	1
2	Base Plate	.31 x 5.44 x 5.44	1





SCALE 2:3



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report # G6139.01-119-19

Date 1/9/17 Tech AJS

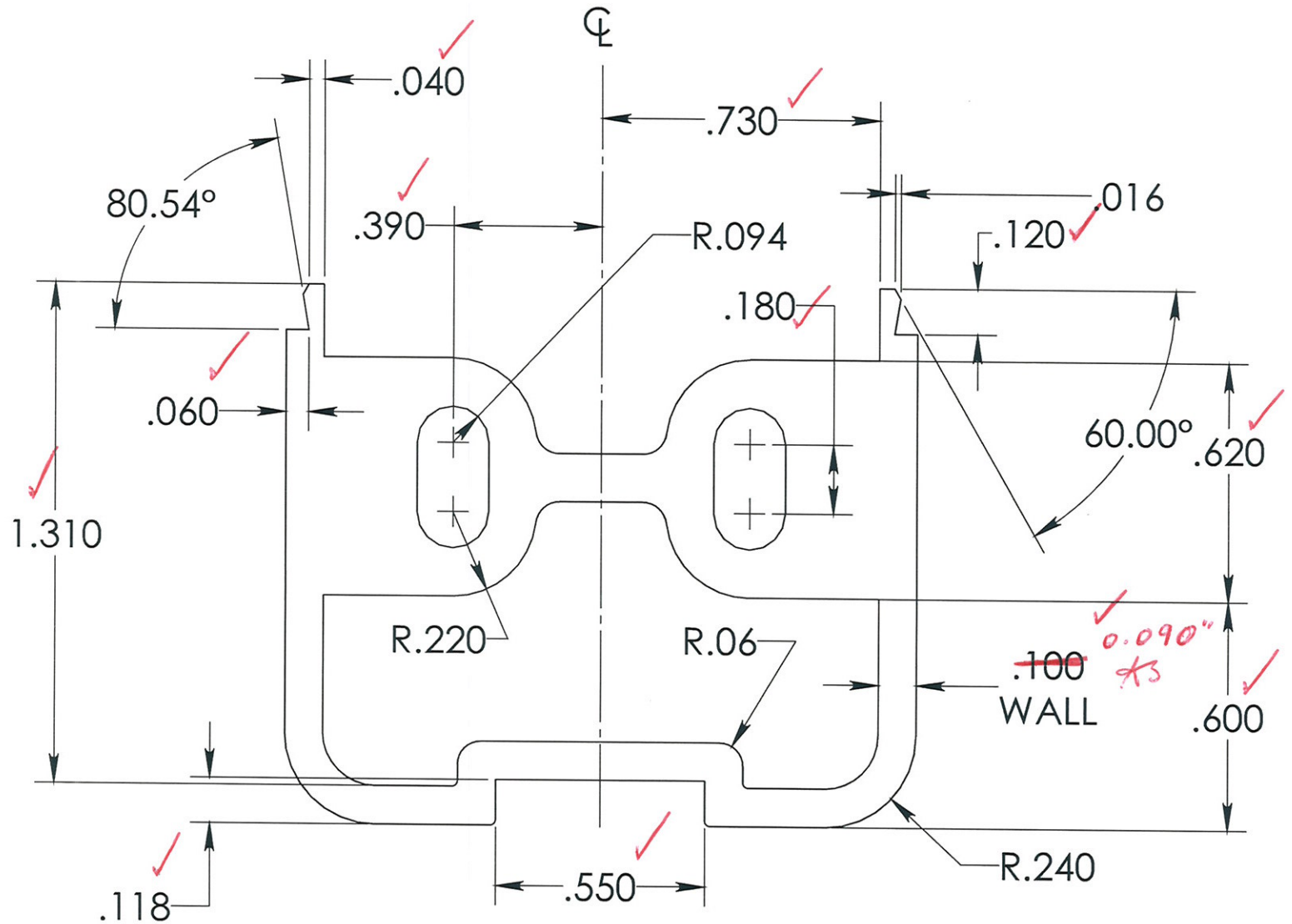
		NAME	DATE
UNLESS OTHERWISE SPECIFIED:			
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	DRAWN	NJC	1/8/2017
	JOB #		
	COMMENTS:		
MATERIAL 6005-T5			
QUANTITY 1			
DO NOT SCALE DRAWING			

PREFERRED RAILING

TITLE:
3.5 IN COMMERCIAL END POST

SIZE	DWG. NO.	REV
B	3.5 in. commercial post	

SCALE: 1:4	WEIGHT:	SHEET 1 OF 1



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report # G-6139.01-119-19

Date 1/9/17 Tech AJS

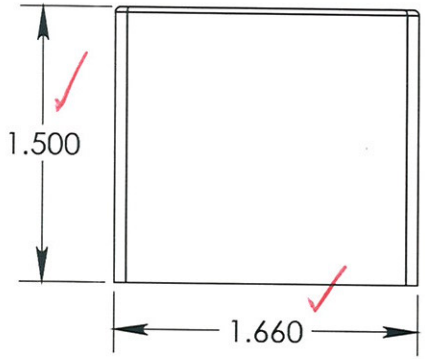
UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	DRAWN	NJC	1/8/2017
	JOB #		
MATERIAL 6005-T5	COMMENTS:		
QUANTITY			
DO NOT SCALE DRAWING, IF IN DOUBT ASK			

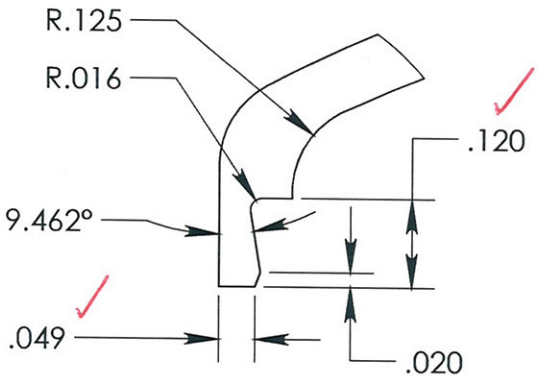
PREFERRED RAILING

TITLE: Top
PREFERRED ~~BOTTOM~~ RAIL BRACKET
BASE PROFILE

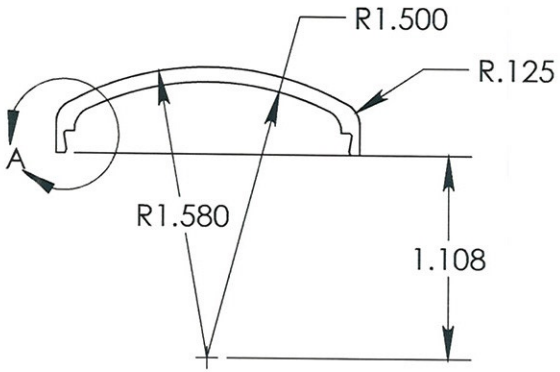
SIZE	DWG. NO.	REV
A	P-BLB-Y Profile	
SCALE: 2.5:1	WEIGHT:	SHEET 1 OF 1

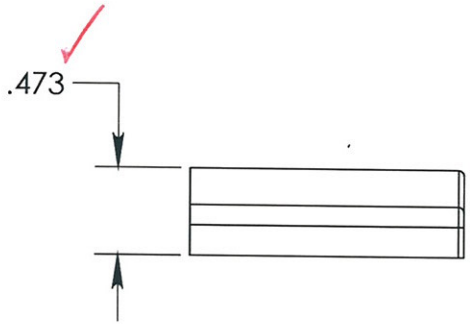
5 4 3 2 1





DETAIL A
SCALE 4 : 1





Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report # G6139.01-119-19

Date 1/9/17 Tech AJS

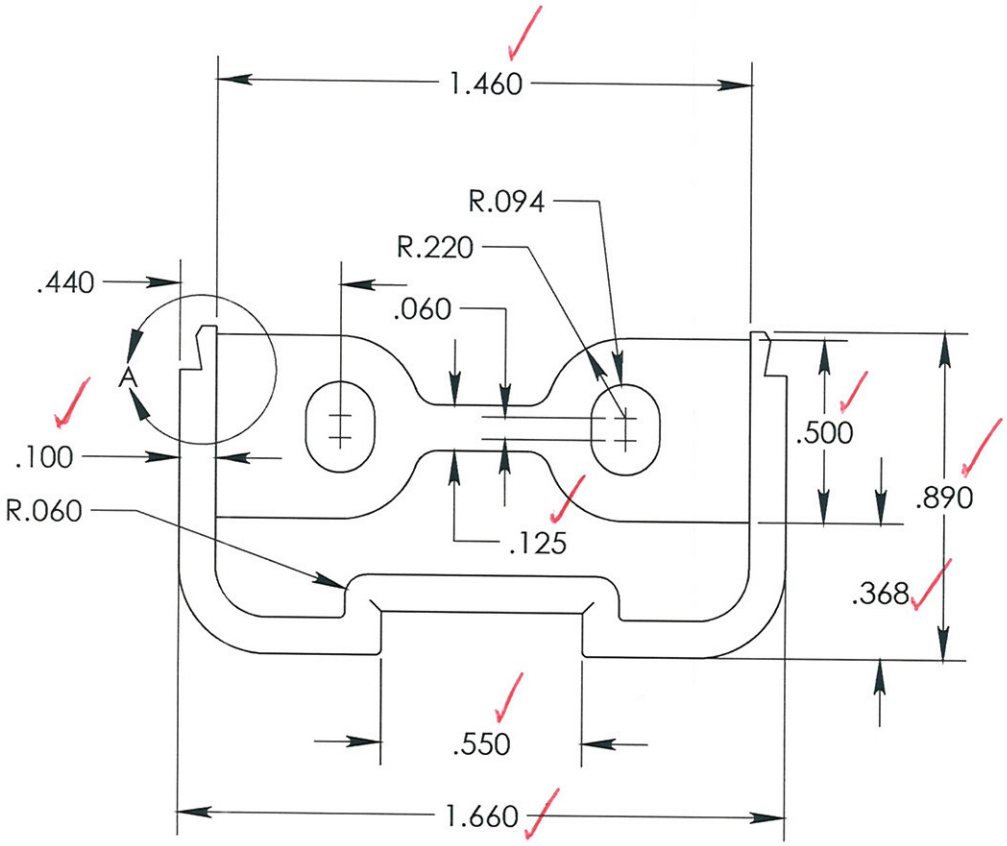
UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	DRAWN	NJC	1/8/2017
	JOB #		
MATERIAL 6005-T5	COMMENTS:		
QUANTITY			
DO NOT SCALE DRAWING			

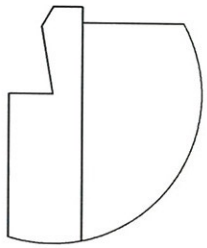
PREFERRED RAILING

TITLE:
SERIES 100 TOP RAIL LEVEL BRACKET CAP

SIZE	DWG. NO.	REV
A	H-TLB-X	
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

5 4 3 2 1





DETAIL A
SCALE 4 : 1

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report # G6139.01-119-19

Date 1/9/17 Tech AJS

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	DRAWN	MPJ	1/8/2017
	JOB #		
MATERIAL 6005-T5	COMMENTS:		
QUANTITY			
DO NOT SCALE DRAWING			

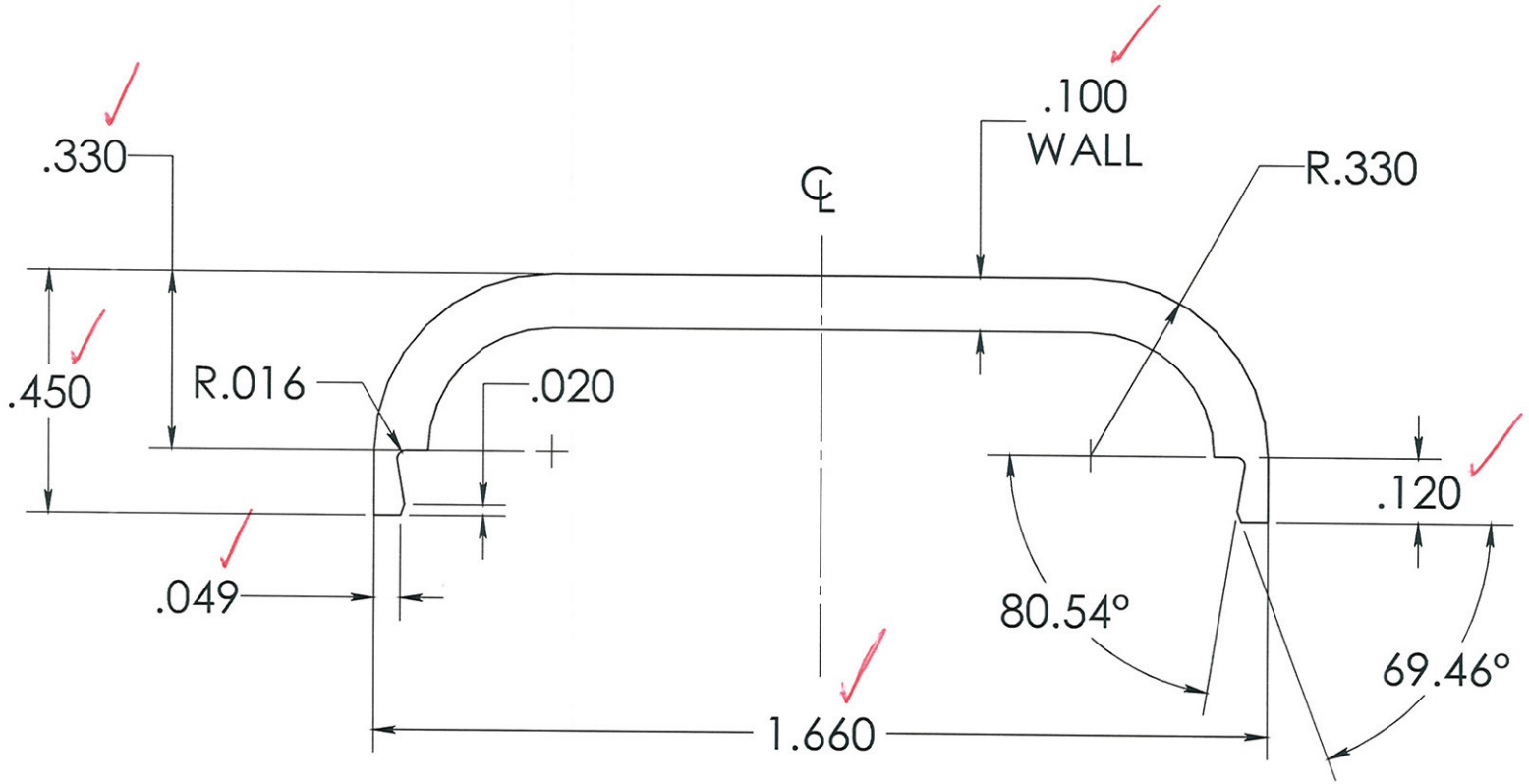
PREFERRED RAILING

TITLE:
SAVANNA BOTTOM LEVEL
BRACKET SADDLE

SIZE	DWG. NO.	REV
A	H-BLB-Y	A

SCALE: 1:1 | WEIGHT: | SHEET 1 OF 1

5 4 3 2 1



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report # G6139.01-119-19

Date 1/9/17 Tech AJS

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	DRAWN	NJC	1/8/2017
	JOB #		
	COMMENTS:		
MATERIAL 6005-T5			
QUANTITY			
DO NOT SCALE DRAWING, IF IN DOUBT ASK			

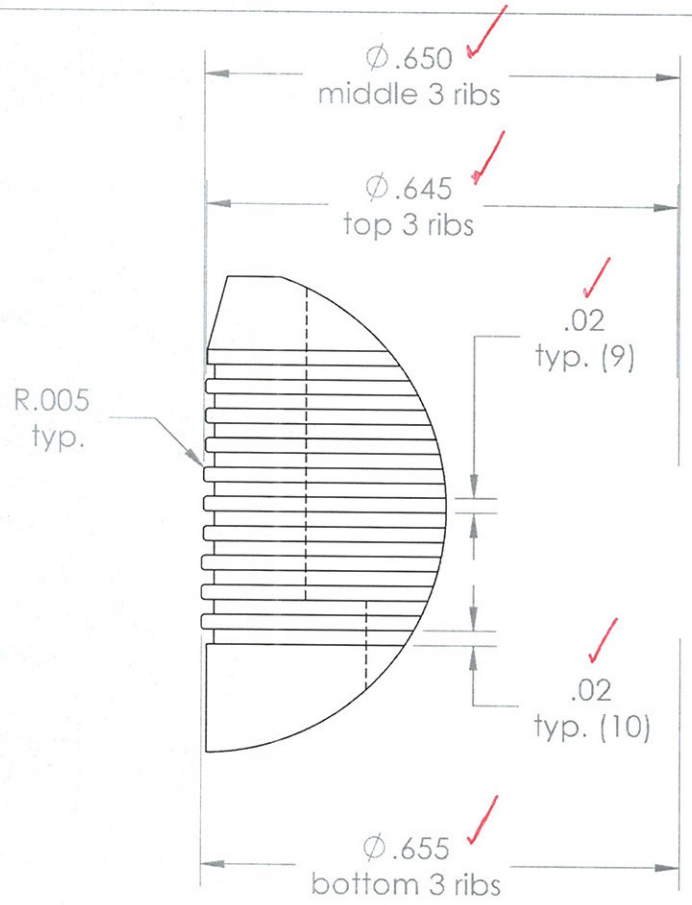
PREFERRED RAILING

TITLE:
SAVANNA BOTTOM LEVEL BRACKET CAP

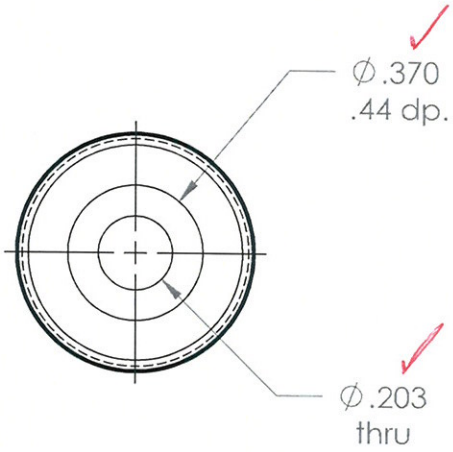
SIZE	DWG. NO.	REV
A	P-BLB-X	

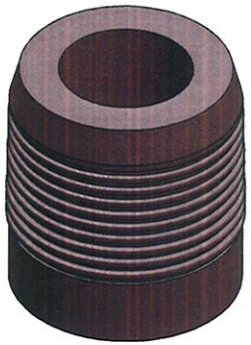
SCALE: 3:1 | WEIGHT: | SHEET 1 OF 1

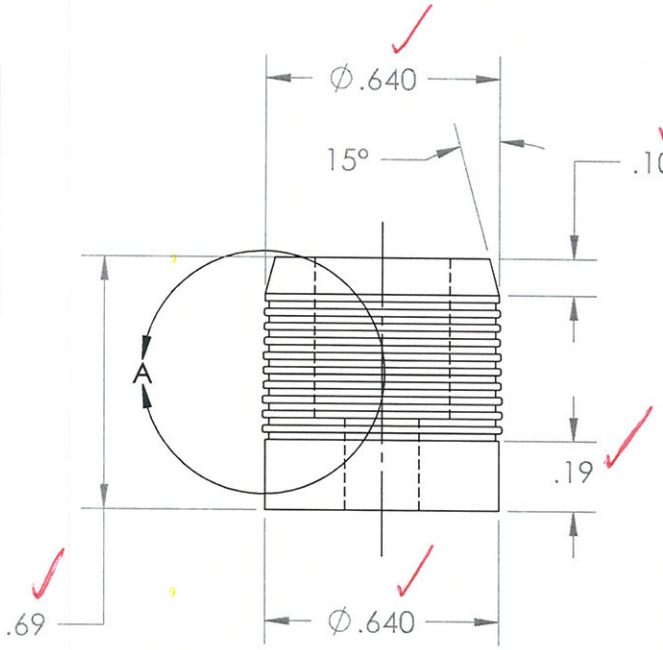
5 4 3 2 1



DETAIL A
SCALE 4 : 1







Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report # 02139.01-119-19

Date 1/9/17 Tech AJS

KPB PRODUCTS INC.

PART NAME:

Round Connector

PART NO: **RBC** SHEET 1 OF 1

APPENDIX B

Photographs

Photo No. 1
In-Fill Load Test at Center of Two Pickets

Photo No. 2
In-Fill Load Test at Bottom of Two Pickets

Photo No. 3
Concentrated Load Test at Mid-Span of Top Rail

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

Photo No. 5
Concentrated Load Test at Top of Post Mount

Photo No. 6
Bottom Rail Bracket and Post Mount Connection

Photo No. 7
Top Rail Collar Bracket and Connections

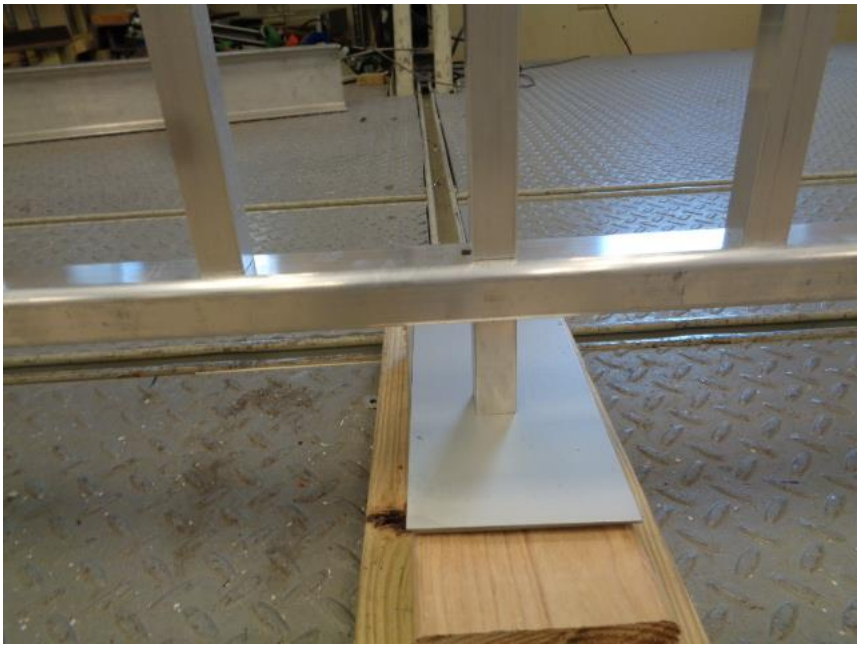


Photo No. 8
Bottom Rail Support Block