Architectural Testing

TEST REPORT

Rendered to:

BARRETTE OUTDOOR LIVING, INC.

For:

***VersaRail* Aluminum Guardrail Assembly**

Report No: C4472.01-119-19
Report Date: 02/13/13

130 Derry Court
York, PA 17406-8405
phone: 717-764-7700
fax: 717-764-4129
www.archtest.com

Architectural Testing

TEST REPORT

C4472.01-119-19
February 13, 2013

TABLE OF CONTENTS

1.0 General Information 1
1.1 Product 1
1.2 Project Description 1
1.3 Limitations 1
1.4 Qualifications 1
1.5 Witnessing 2
1.6 Conditions of Testing 2
1.7 Product Description 2
2.0 Structural Performance Testing of Assembled Railing Systems 3
2.1 Test Equipment 3
2.2 Test Setup 3
2.3 Test Procedure 3
2.4 Test Results 4
2.5 Summary and Conclusions 6
3.0 Closing Statement 7
Revision Log 8
Appendix A – Drawings
Appendix B – Photographs

Architectural Testing

TEST REPORT

Rendered to:

BARRETTE OUTDOOR LIVING, INC.
740 North Main Street
Bulls Gap, Tennessee 37711

Report No.:	C4472.01-119-19
Test Date Started:	01/15/13
Test Date Completed:	01/15/13
Report Date:	02/13/13

1.0 General Information

1.1 Product

Aluminum Guardrail System - *VersaRail*

1.2 Project Description

Architectural Testing was contracted by Barrette Outdoor Living Inc. to conduct structural performance tests on the 8 ft wide by 42 in high *VersaRail* aluminum level guardrail system. The system was evaluated for the design load requirements of the following building codes:

2012 *International Building Code*®, International Code Council

Structural tests were performed according to Chapter 17 (Structural Tests and Special Inspections) of IBC 2012.

1.3 Limitations

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.

1.4 Qualifications

Architectural Testing has demonstrated compliance with ANS/ISO/IEC Standard 17025 and is consequently accredited as a Testing Laboratory (TL-144) by International Accreditation Service, Inc.

130 Derry Court
York, PA 17406-8405
phone: 717-764-7700
fax: 717-764-4129
www.archtest.com

1.5 Witnessing

Richard Barkley from Barrette Outdoor Living, Inc was present for testing conducted and reported herein.

1.6 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. All test specimen materials provided by Barrette Outdoor Living were stored in the laboratory environment for no less than 40 hours prior to testing.

1.7 Product Description

Barrette Outdoor Living provided the test specimens with the following details:

Top Rail Cap: 2-1/8 in high by 1-3/4 in wide contoured 6063-T5 aluminum extrusion with 0.07 in wall

Top Sub-rail and Bottom Rail: 1-3/16 in wide by 1 in deep **U**-shaped 6063-T5 aluminum extrusion with 0.07 in wall

Balusters: 3/4 in square, hollow 6063-T5 aluminum extrusion with 0.04 in wall

Picket Locking Strip: 3/4 in wide by 0.07 in thick glass reinforced polypropylene extrusion located in bottom and top sub-rail

Rail Brackets: Cast AA380.0-F aluminum brackets contoured to shape of rails

Fasteners: #8 x 1-1/2 in (18-TPI, 0.164 in major dia., .0116 in minor dia.) pan head, square drive, self-starting, zinc screws (four in top bracket / post, two in bottom bracket / post, and two in top bracket / rail) (9/64 in pre-drill)

Post Mounts:

- Steel Post Mount with Aluminum Post Sleeve: 2 in square by 0.125 in thick hot-rolled steel tube attached to a 4 in square by 0.375 in thick steel base plate with a 3/16 in by 1-3/4 in long fillet weld on each side; the steel tube was sleeved by a 2-1/2 in square by 0.08 in thick extruded 6005-T5 aluminum tube attached to the base plate with four 1/4 in by 2-1/2 in flat head, phillips drive, steel screws driven through raceway channels in aluminum sleeve.
- Steel Post Mount with PVC Post Sleeve: 2 in square by 0.125 in thick hot-rolled steel tube attached to a 4 in square by 0.375 in thick steel base plate with a 3/16 in by 1-3/4 in long fillet weld on each side; the steel tube was sleeved at the top and bottom by a 4 in square by 6-1/8 in long HDPE internal spacer; the internal spacers were sleeved by a 4-1/2 in square by 6-5/8 in long plastic sleeve; a 5 in square PVC post sleeve was fitted over the post/spacer assembly; a 4 in square by 1/4 in thick steel plate was included for wood deck installation.

Support Block: Extruded aluminum support leg located directly under the sixth baluster from each post.

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

2.0 Structural Performance Testing of Assembled Railing Systems

2.1 Test 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.

2.2 Test Setup

The 8 ft wide by 42 in high *VersaRail* level guardrail assembly was installed and tested as a single railing section by directly securing the posts into the surface of a rigid steel channel (to simulate anchorage into concrete) with four 5/16 in by 1-1/2 in Grade 8 hex head bolts with nuts and washers. 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 Appendix B for individual test setups.

2.3 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.

2.4 Test Results

The following tests were performed on the guardrail assemblies for the design load requirements of the codes referenced. 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, except for the vertical uniform load test on the top rail.

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.

8 ft (93-1/4 in Overall Rail Length) by 42 in *VersaRail* Level Guardrail System
IBC – All Use Groups

Specimen No. 1 of 1

Test No. 1 – 01/15/13 **Design Load: 50 lb / 1 Square Ft at Center of In-Fill (Two Pickets)**						
Load Level	**Test Load (lb)**	**E.T. (min:sec)**	**Picket Displacement (in)**			
			End	**Mid**	**End**	**Net [1]**
Initial Load	10	00:00	0.00	0.00	0.00	0.00
2.0 x Design Load	100	00:29	0.49	1.24	1.23	0.38
Initial Load	10	01:48	0.02	0.14	0.28	0.00
100% Recovery from 2.0 x Design Load						
2.5 x Design Load	127	02:08	Achieved Load without Failure			

[1] *Net displacement was the picket displacement relative to its top and bottom.*

Test No. 2 – 01/15/13 **Design Load: 50 lb / 1 Square Ft at Bottom of In-Fill (Two Pickets)**						
Load Level	**Test Load (lb)**	**E.T. (min:sec)**	**Bottom Rail Displacement (in)**			
			End	**Mid**	**End**	**Net [1]**
Initial Load	10	00:00	0.00	0.00	0.00	0.00
2.0 x Design Load	101	00:28	0.20	2.15	0.16	1.97
Initial Load	10	01:41	0.04	0.15	0.02	0.12
94% Recovery from 2.0 x Design Load						
2.5 x Design Load	127	02:11	Achieved Load without Failure			

[1] *Net displacement was the bottom rail displacement relative to its ends.*

2.4 Test Results (Continued)

Specimen No. 1 of 1 (Continued)

Test No. 3 – 01/15/13 **Design Load: 50 plf x (93-1/4 in ÷ 12 in/ft) = 389 lb Horizontal Uniform Load on Top Rail [1]**						
Load Level	**Test Load (lb)**	**E.T. (min:sec)**	**Rail Displacement (in)**			
			End	**Mid**	**End**	**Net**
Initial Load	78	00:00	0.00	0.00	0.00	0.00
2.0x Design Load	778	01:11	1.06	3.93	0.96	2.92
Initial Load	78	02:48	0.05	0.15	0.05	0.10
97% Recovery from 2.0 x Design Load						
2.5x Design Load	971	03:50	Achieved Load without Failure			

[1] *Uniform Load was simulated with quarter point loading.*

Test No. 4 – 01/15/13 **Design Load: 50 plf x (93-1/4 in ÷ 12 in/ft) = 389 lb Vertical Uniform Load on Top Rail [1]**						
Load Level	**Test Load (lb)**	**E.T. (min:sec)**	**Rail Displacement (in)**			
			End	**Mid**	**End**	**Net**
Initial Load	80	00:00	0.00	0.00	0.00	0.00
2.0x Design Load	780	01:03	0.00	0.34	0.00	0.34
Initial Load	79	02:49	0.00	0.06	0.00	0.06
82% Recovery from 2.0 x Design Load						
2.5x Design Load	980	03:41	Achieved Load without Failure			

[1] *Uniform Load was simulated with four equally distributed load points.*

Test No. 5 – 01/15/13 **Design Load: 200 lb Concentrated 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	802	00:45	1.29	1.08
Initial Load	83	02:13	0.04	0.01
Recovery: N/A				
(2.5x Design Load) x 2	1003	03:00	Achieved Load without Failure	

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

2.4 Test Results (Continued)

Specimen No. 1 of 1 (Continued)

Test No. 6 – 01/15/13 Design Load: 400 lb Concentrated Load at Top of Stand-Alone Post [1] (42 in high)			
Load Level	**Test Load (lb)**	**E.T. (min:sec)**	**Post Displacement (in)**
Initial Load	80	00:00	0.00
2.0x Design Load	800	01:05	2.22
Initial Load	86	02:33	0.33
85% Recovery from 2.0 x Design Load			
2.5x Design Load	1000	03:50	Achieved Load without Failure

[1] *2 in square steel post mount with a 2-1/2 in square aluminum sleeve.*

Test No. 7 – 01/15/13 Design Load: 409 lb Concentrated Load at Top of Stand-Alone Post [1] (42 in high)			
Load Level	**Test Load (lb)**	**E.T. (min:sec)**	**Post Displacement (in)**
Initial Load	82	00:00	0.00
2.0x Design Load	819	01:07	2.58
Initial Load	87	02:30	0.47
82% Recovery from 2.0 x Design Load			
2.5x Design Load	1024	03:45	Achieved Load without Failure

[1] *2 in square steel post mount with a 5 in square PVC post sleeve with internal spacers.*

2.5 Summary and Conclusions

Using performance criteria of 75% deflection recovery from 2.0 times design load and 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 *VersaRail* guardrail assemblies 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.

3.0 Closing Statement

Detailed drawings, data sheets, representative samples of test specimens, a copy of this test report, and all other supporting evidence will be retained by Architectural Testing for a period of four years from the original test date. At the end of this retention period, said materials shall be discarded without notice, and the service life of this report by Architectural Testing shall expire. Results obtained are tested values and were secured using the designated test methods. This report neither constitutes certification of this product nor expresses an opinion or endorsement by this laboratory; it is the exclusive property of the client so named herein and relates only to the tested specimens. This report may not be reproduced, except in full, without the written approval of Architectural Testing.

For ARCHITECTURAL TESTING:

Digitally Signed by: Kyle Evans

Kyle J. Evans
Technician II
Structural Systems Testing

Digitally Signed by: Virgal Thomas Mickley, Jr.

V. Thomas Mickley, Jr., P.E.
Senior Project Engineer
Structural Systems Testing

KJE:vtm/drm

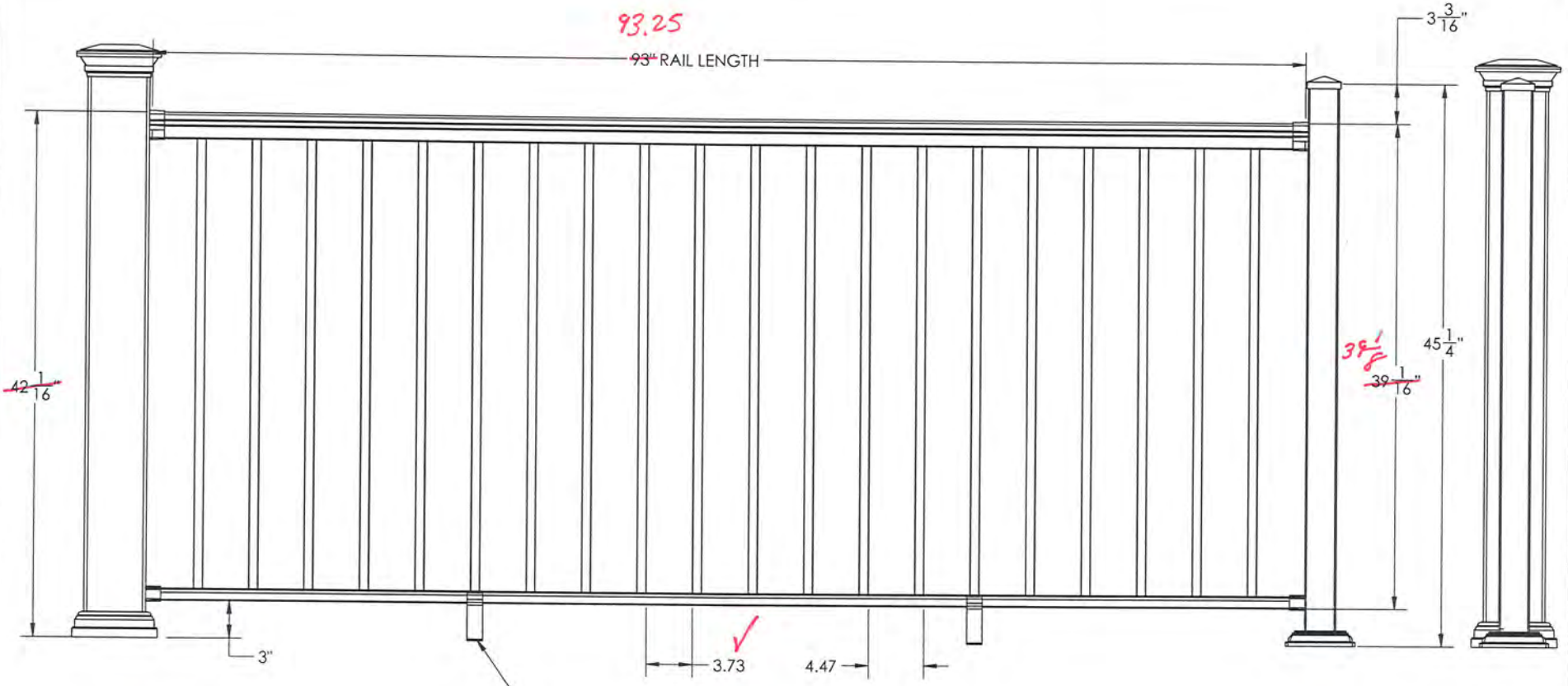
Attachments (pages): *This report is complete only when all attachments listed are included.*
Appendix A - Drawings (16)
Appendix B - Photographs (6)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	02/13/13	N/A	Original report issue

APPENDIX A

Drawings



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# C4472.01-119-19

Date 2/13/13 Tech KJE

Weight = 55.63 lbs
Material = Aluminum Alloys & Steel Base Plates

TOLERANCES	
FRACTION	± 1/64"
XX	± 0.010"
XXX	± 0.005"
ANGLE	± 1°
UNSPECIFIED FINISH (μ")	125 RMS
UNLESS OTHERWISE SPECIFIED	

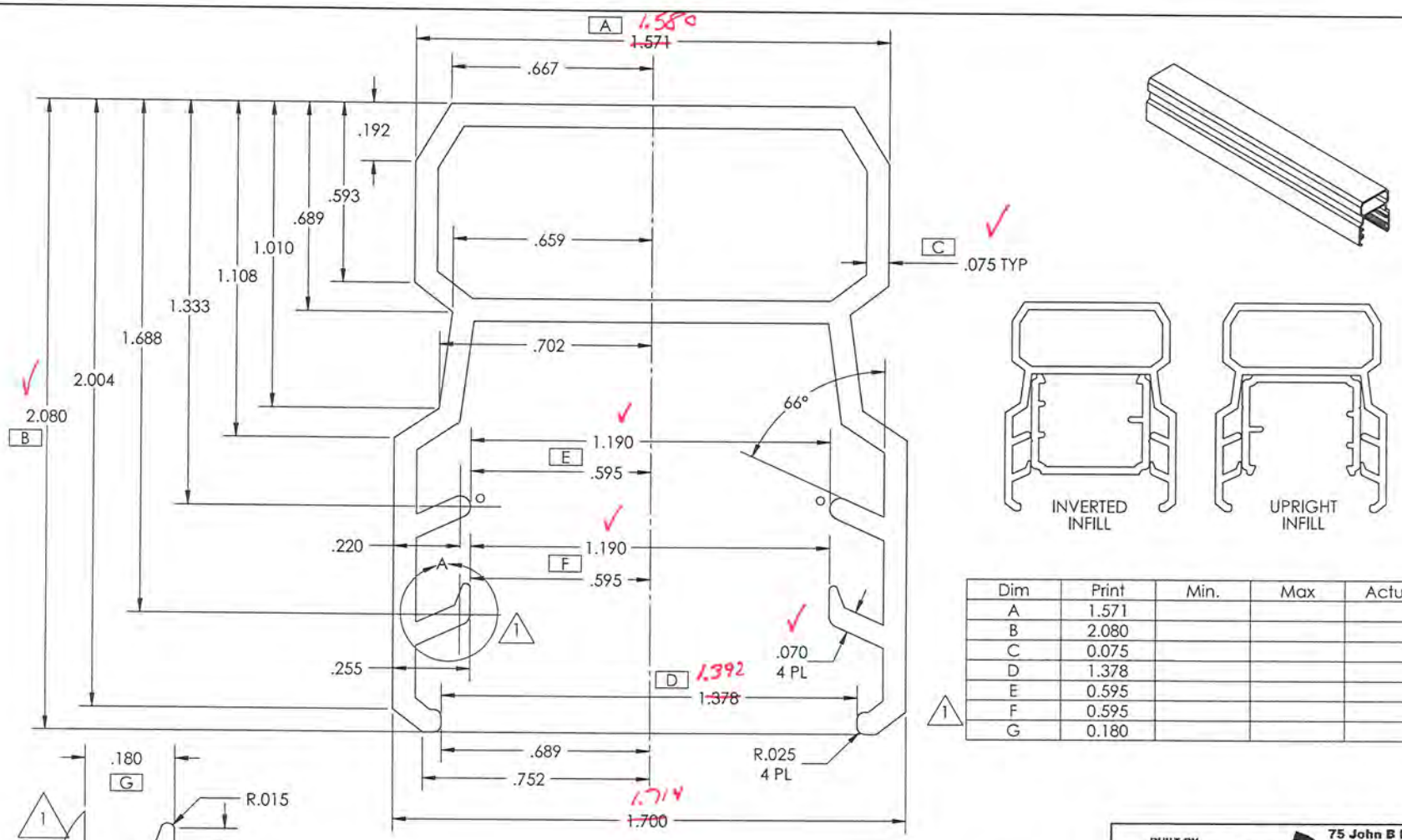
No	NAME	DATE	DESCRIPTION
REVISION			

BUILT BY Barrette Outdoor Living
75 John B Brooks Rd
Pendergrass, Ga
30567
706-693-4062
706-693-4064 fax

DRAWN BY:	DATE:	SCALE:
Ray Clark	2/13/2013	1:8

TITLE: VERSARAIL 42" H X 8 FT w/BALUSTERS

EQUIPMENT No:	SECTION:	REVISION	DRAWING No:
REFERENCE No:	6 of 7	0	42 X 8'wElite



Dim	Print	Min.	Max	Actual
A	1.571			
B	2.080			
C	0.075			
D	1.378			
E	0.595			
F	0.595			
G	0.180			

Weight = 0.68 lbs
Material = 6063-T5 Aluminum

NOTES:
(o) DENOTES FULL R 2 PL
BREAK SHARP CORNERS .015 R

TOLERANCES	
FRACTION	± 1/64"
XX	± 0.010"
XXX	± 0.005"
ANGLE	± 1°
UNSPECIFIED FINISH (µ")	125 RMS
UNLESS OTHERWISE SPECIFIED	

No	NAME	DATE	DESCRIPTION
1	JD	08.10.11	Revision to shape of feature in Detail "A"

REVISION

BUILT BY
Barrette Outdoor Living
75 John B Brooks Rd
Pendergrass, Ga
30567
706-693-4062
706-693-4064 fax

DRAWN BY: Ray Clark | DATE: 10/25/2012 | SCALE: 3:1

TITLE: VERSARAIL HANDRAIL

EQUIPMENT No: | SECTION: | REVISION: 1 | DRAWING No: Sheet1

REFERENCE No: | 1 of 1

Architectural Testing

Test sample complied with above design. Deviations are noted.

Report# C4472.01-119-19

Date 2/13/13 Tech RJE

PRINT APPROVAL

PLEASE INDICATE EXPOSED SURFACES
PLEASE INDICATE WHERE INTEX I.D. GOES

COMPANY _____

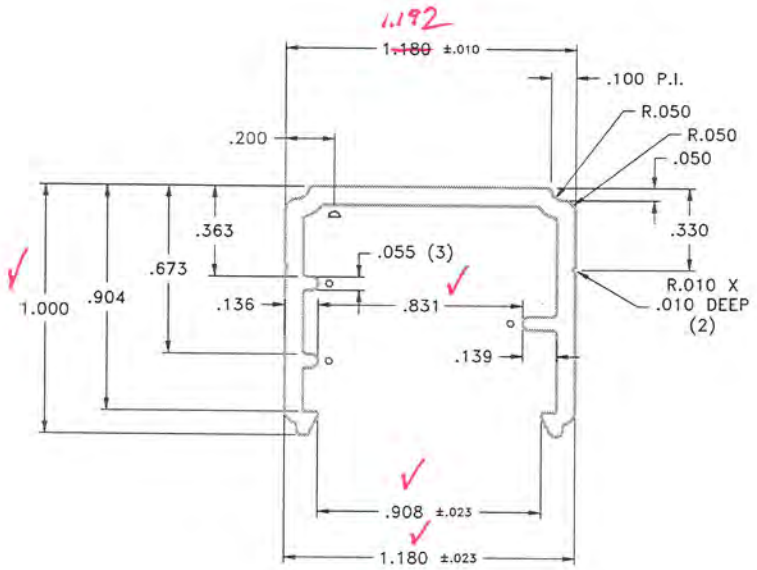
SIGNATURE _____

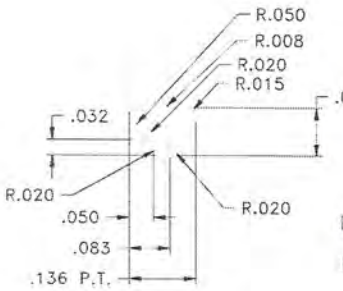
DATE _____

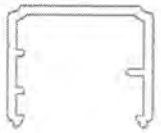
YOUR SIGNATURE INDICATES NO CHANGES TO DIMENSIONS OR TOLERANCES AS SHOWN ON THIS DRAWING. THIS IS NOT AN INTERNATIONAL EXTRUSIONS DESIGN. IT IS AN INTERPRETATION OF THE CUSTOMER'S DRAWING. NO WARRANTY OF FITNESS OR APPLICATION OF USE IS IMPLIED. ALL DIMENSIONAL CHECKS WILL BE DONE USING THIS PRINT ONLY.

KE-10509

VERSION TWO DRAWING







Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# C4472.01-119-19

Date 2/13/13 Tech KJB

Material = 6063-T5

(⌀) R.01 X .01 DEEP I.D. MARK
(o) DENOTES FULL R (3)
TYPICAL UNMARKED WALL .075
BREAK SHARP CORNERS .015 R

International Extrusions

ALUMINUM ASSOCIATES STANDARD EXTRUSION TOLERANCES WILL APPLY UNLESS OTHERWISE NOTED ON PRINT

DIMENSIONS CHKD BY				
EST. AREA	.237	DESCRIPTION	DR BY ECP	DATE 6-22-2011
EST. WT. FT.	.285	INFILL PROFILE	SLS 97	SCALE 2X
EST. PER.	6.562		FILE PLUTO	DIE NO.
FIN. PER.			DWG# 11B173B2	
CLASS	SOLID			
CIRCLE SIZE	1.500	CUSTOMER		PART NO.
CUST REV LEV	NONE	BARRETTE OUTDOOR PRODUCTS		NONE

PRINT APPROVAL

PLEASE INDICATE EXPOSED SURFACES

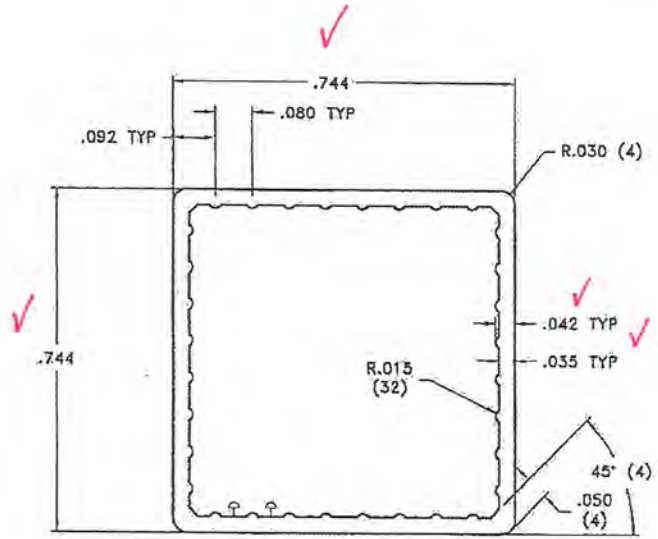
PLEASE INDICATE WHERE DRAFT I.D. GOES

COMPANY Satellite Mfg. Inc.

SIGNATURE

DATE 4/20/11

YOUR SIGNATURE INDICATES NO CHANGES TO DIMENSIONS OR TOLERANCES AS SHOWN ON THIS DRAWING. THIS IS NOT AN INTERNATIONAL EXTRUSIONS DESIGN, IT IS AN INTERPRETATION OF THE CUSTOMER'S DRAWING. NO WARRANTY OF FITNESS OR APPLICATION OF USE IS IMPLIED. ALL DIMENSIONAL CHECKS WILL BE DONE USING THIS PRINT ONLY.



EXTERIOR PERIMETER EXPOSED

ACTUAL SIZE

PRELIMINARY DRAWING

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# C4472.01-119-19

Date 2/13/13 Tech KJE

Material = 6063-T5

(a) R.01 X .01 HI I.D. MARK

BREAK SHARP CORNERS .010 R

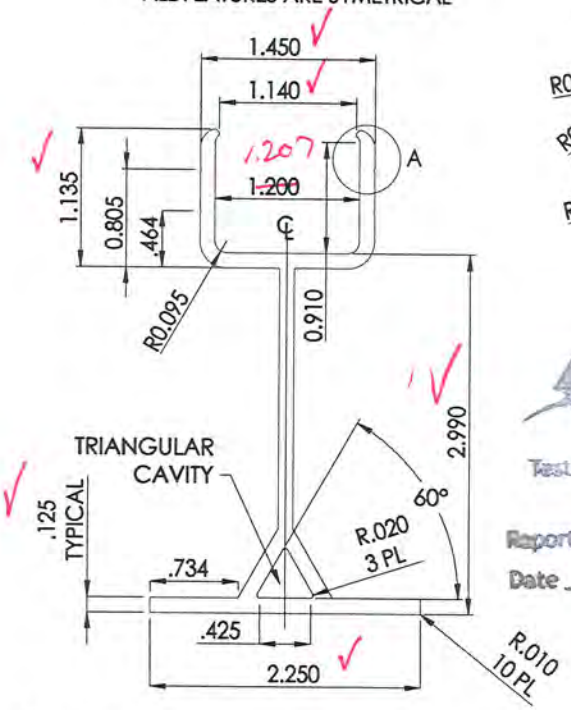
International Extrusions

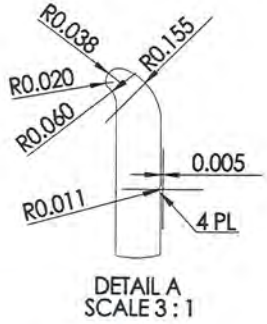
5800 Venoy Rd. – Garden City MI 48135

ALUMINUM ASSOCIATES STANDARD EXTRUSION TOLERANCES WILL APPLY UNLESS OTHERWISE NOTED ON PRINT

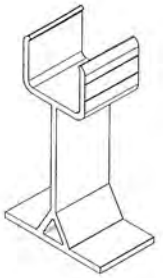
DIMENSIONS CHKD BY				
EST. AREA	.103	DESCRIPTION	DR. BY EGP	DATE 4-20-2011
EST. WT. FT.	.124	NEW 3/4" SQUARE COMMERTIAL PICKET	SLS 97	SCALE 4X
EST. PER.	2.924		FILE PLUTO	DIE NO.
FIN. PER.	2.924		DWG# 11S110B2	
CLASS	HOLLOW			
CIRCLE SIZE	1.250	CUSTOMER		PART NO.
CUST REV LEV	NONE	BARRETTE OUTDOOR PRODUCTS		RND75040

ALL FEATURES ARE SYMETRICAL

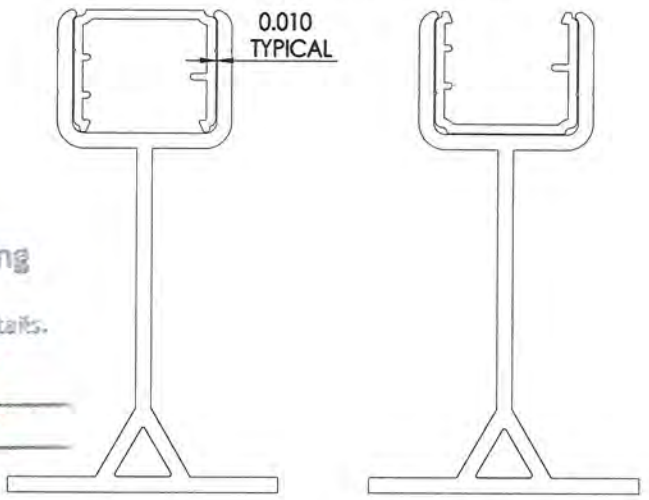




DETAIL A
SCALE 3 : 1



ORIENTATION AND RELATIONSHIP TO OUR
EXISTING PART #KE10590 -YOUR DWG #11B17382



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# C4472.01-119-13

Date 2/13/13 Tech KJE

REVISION 03
EQUILATERAL TRIANGULAR CAVITY
REVISION 02
TRIANGULAR CAVITY ADDED
AS AID TO PAINTING

Weight = 0.1362 lbs/linear ft
Material = 6063-T5

TOLERANCES	
FRACTION	± 1/64"
XX	± 0.010"
XXX	± 0.005"
ANGLE	± 1°
UNSPECIFIED FINISH (u")	125 RMS
UNLESS OTHERWISE SPECIFIED	

No	NAME	DATE	DESCRIPTION
			REVISION

BUILT BY Barrette Outdoor Living
75 John B Brooks Rd
Pendergrass, Ga
30567
706-693-4062
706-693-4064 fax

DRAWN BY: Ray Clark | DATE: 1/10/2012 | SCALE: 1:1

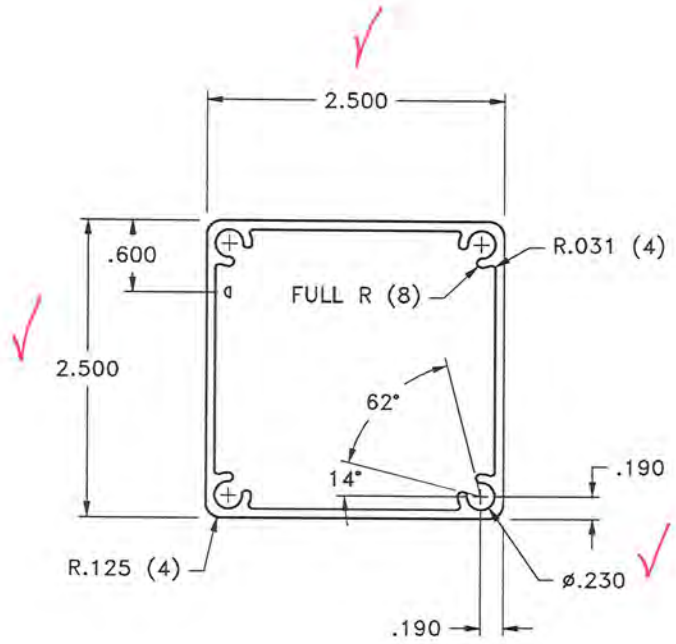
TITLE: P:\Engineering 2011\Research and Development\RND7504\Apnt\

CRUSH BLOCK 03

EQUIPMENT No: | SECTION: 1 of 1 | REVISION: 0 | DRAWING No:

REFERENCE No:

KE9582



Material = 6005-T5
EXTERIOR PERIMETER EXPOSED

Architectural Testing
Test sample complies with these details.
Deviations are noted.
Report# C4472.01-119-19
Date 2/13/13 Tech KJB

(a) R.01 X .01 HI I.D. MARK
TYPICAL UNMARKED WALL .075
BREAK SHARP CORNERS .015 R

International Extrusions
5800 Venoy Rd. - Garden City MI 48135
ALUMINUM ASSOCIATES STANDARD EXTRUSION TOLERANCES WILL APPLY UNLESS OTHERWISE NOTED ON PRINT

DIMENSIONS CHKD BY				
EST. AREA	.828	DESCRIPTION	DR. BY ECP	DATE 7-16-2008
EST. WT. FT.	.994	2-1/2" POST	SLS 97	SCALE FULL
EST. PER.	9.785		FILE PLUTO	DIE NO. KE9582
FIN. PER.	9.785		DWG# 08S198B1	
CLASS	HOLLOW			
CIRCLE SIZE	3.500	CUSTOMER		PART NO.
CUST REV LEV	NONE	BARRETTE OUTDOOR PRODUCTS		NONE

Notes:
1. Part to be tooled from 3D CAD model.
2. Tubing 2x2x0.120 wall thickness, tolerance as indicated on drawing.
3. Plate 4x4x.375 thickness, tolerance as indicated on drawing.
4. Tube to be continuous welded to plate, centered within 1/16", perpendicular within 2 degrees.
5. Tubing is electric resistance welded carbon steel tube grade 1008/1010, complying with ASTM designation A513-07.
6. Steel plate is grade 1010 steel, hot rolled.
7. This assembly is a safety component, weld quality must be assured. Standard welding processes for grade 1008/1010 must be followed using certified operators and machines.
8. Powder coat finish required after assembly, color black, AAMA 2603-98 standard, with the additional requirements of (2.5 mil) minimum thickness and 15 year warranty.
   - Coating must be lead free
   - Certificate of conformity must be included with each shipment.

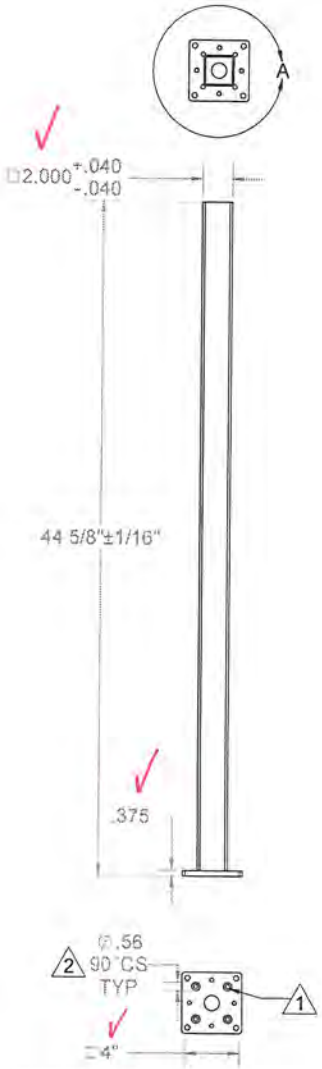
   Part will be exposed to:
   - Outside weathering
   - Pressure treated wood
   - Concrete
9. MUST PASS ASTM TESTING TO (MIN):
   - GLOSS D-523(40-50%)
   - FILM THICKNESS D-7091 (2.5±0.5 MILS)
   - HARDNESS D3363 (2H-9H)
   - IMPACT DIRECT/INDIRECT D-2794 (1.5 MILS)
   - ADHESION/CROSS HATCH D-3359 (PASS)
   - FLEXIBILITY D22 (PASS)
10. No burrs or sharp edges allowed.
11. No weld spatter allowed in holes.

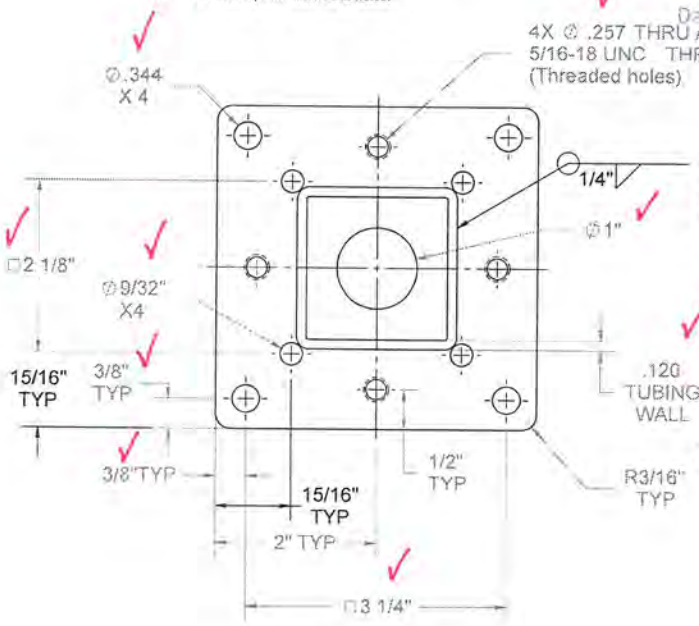
Architectural Testing

Test sample complies with these details. Deviations are noted.

Report# C4472.01-119-19

Date 2/13/13 Tech KJE





DETAIL A
SCALE 1 : 1.5

2 4 WELDS UP TO EDGE OF HOLES SECONDARY OPERATIONS REQUIRED: RE-DRILL 9/32" HOLES, REMOVE ANY WELD SPATTER FROM COUNTER SINK

NO LEAD IS ALLOWED IN ANY USFENCE, INC. PRODUCTS OR MATERIALS

REV.	BY	DATE	PCR	DESCRIPTION
2	WD	7/16/2012	N/A	CHG WELD FROM CONTINUOUS TO 4, ADD SECONDARY OPERATION, CHG CS ANGLE AND INCREASE DIAMETER
1	WD	5/24/2012	120605WED-A	ADD 4 HOLES/CS TO PLATE

TOLERANCES	
FRACTION	±1/64
XX	±0.01
XXX	±0.005
ANGLE	±1.0°
FINISH	125 RMS
UNLESS OTHERWISE SPECIFIED	

Barrette

BARRETTE
Outdoor Living
740 N. Main St., Bulls Gap, TN 37711

DRAWN	DATE	APPROVED
W. DIXON	3/30/2011	

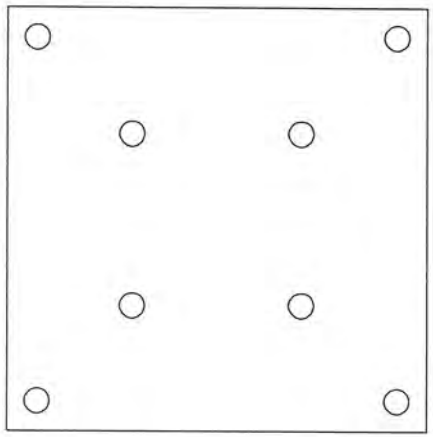
DESCRIPTION: METAL POST ASSY 42" W/ LIGHTING HOLE

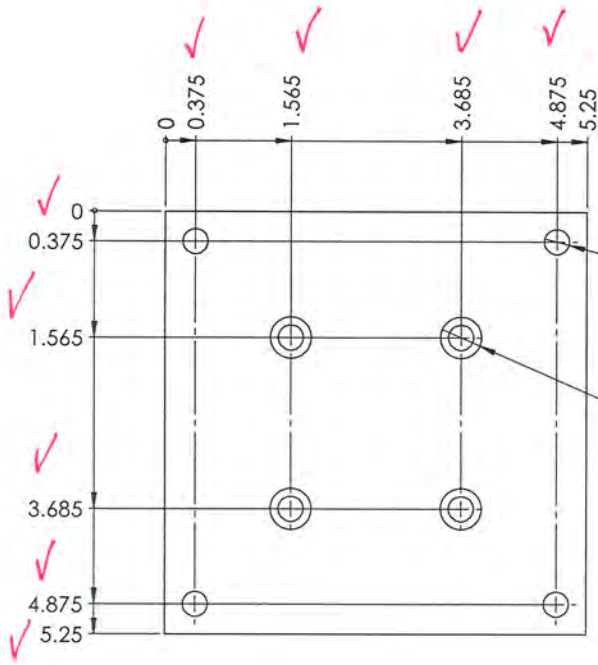
SHEET 1 OF 1
SCALE 1:8
WEIGHT: 12.51

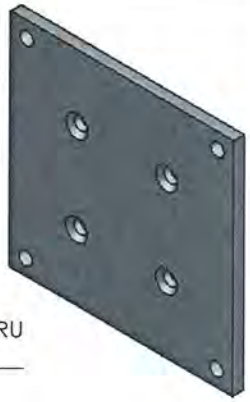
REVISION: 2

PART NUMBER: 34106320

ITEM NO.	DESCRIPTION	LENGTH	QTY.
1	5.25" Base for 2.5" Hand Rail Post	5.25"	1







Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# C4472.01-119-19

Date 2/13/13 Tech KJB

Weight = 1.91 lbs
Material = AISI 1010 Steel, hot rolled bar

TOLERANCES	
FRACTION	± 1/64"
XX	± 0.010"
XXX	± 0.005"
ANGLE	± 1°
UNSPECIFIED FINISH (µ"):	125 RMS
UNLESS OTHERWISE SPECIFIED	

No	NAME	DATE	DESCRIPTION

REVISION

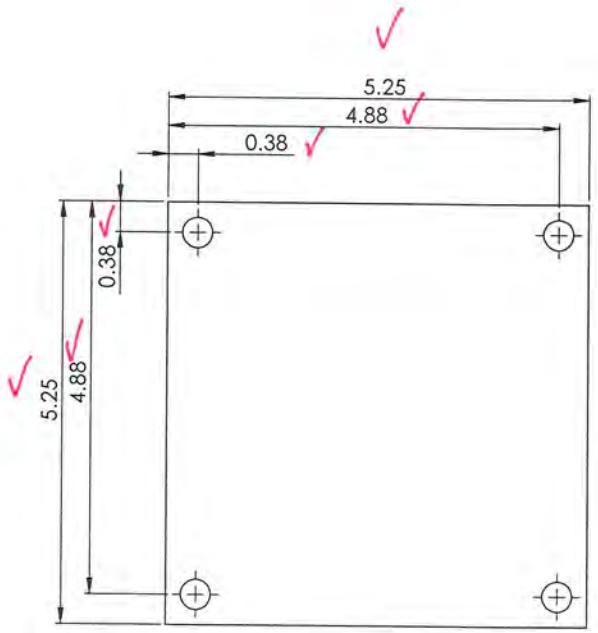
BUILT BY
Barrette Outdoor Living
75 John B Brooks Rd
Pendergrass, Ga
30567
706-693-4062
706-693-4064 fax

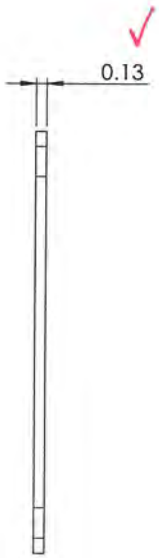
DRAWN BY: Ray Clark	DATE: 10/18/2012	SCALE: 1:1.5

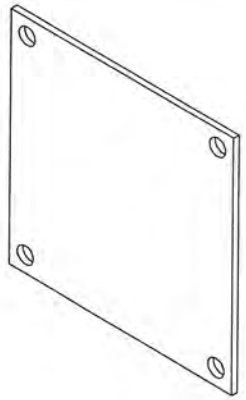
TITLE: P:\Engineering 2011\Research and Development\RND75044\April\Drawings for Testing Docs\

5.25" Base for 2.5" Hand Rail Post

EQUIPMENT No:	SECTION:	REVISION	DRAWING No:
REFERENCE No:	1 of 1	0	







Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# C4472.01-119-19

Date 2/13/13 Tech RJB

Weight = 1.00 lbs
Material = AISI 1010 Steel, hot rolled bar

TOLERANCES	
FRACTION	± 1/64"
.XX	± 0.010"
.XXX	± 0.005"
ANGLE	± 1°
UNSPECIFIED FINISH (μ")	125 RMS
UNLESS OTHERWISE SPECIFIED	

No	NAME	DATE	DESCRIPTION
REVISION			

BUILT BY
Barrette Outdoor Living
75 John B Brooks Rd
Pendergrass, Ga
30567
706-693-4062
706-693-4064 fax

DRAWN BY: Ray Clark | DATE: 10/18/2012 | SCALE: 1:1.5

TITLE: 5.25" BACKUP PLATE - 4 HOLE

EQUIPMENT No: | SECTION: | REVISION: 0 | DRAWING No: Sheet1

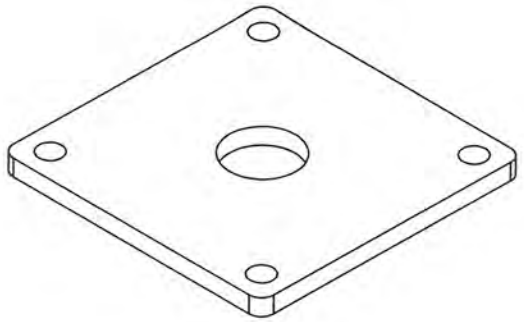
REFERENCE No: | 1 of 1

Notes:

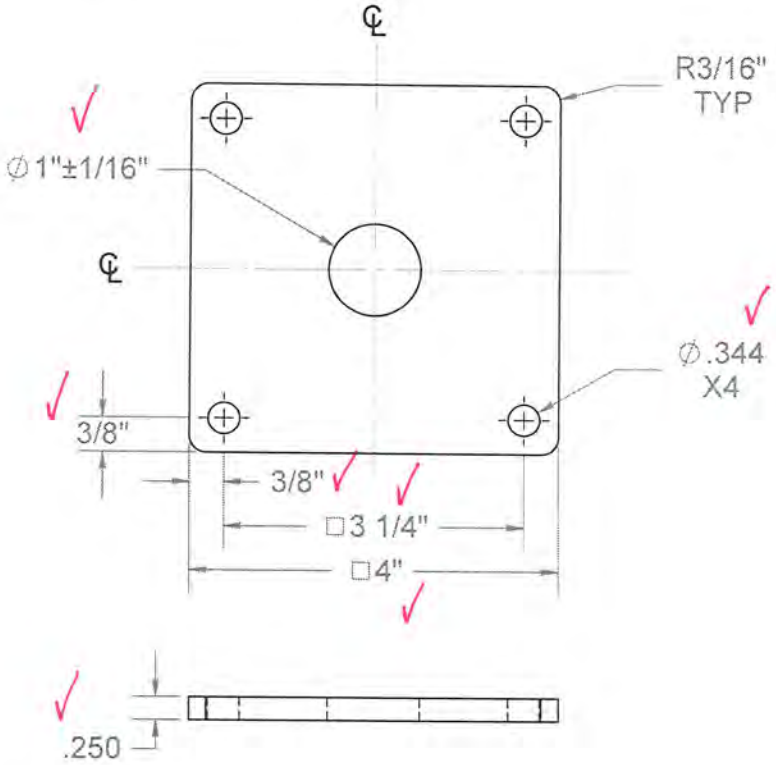
1. Material grade 1010 steel, hot rolled.
2. Powder coat finish required, color black. AAMA 2603-98 standard, with the additional requirements of (1.5 mil) minimum thickness and 15 year warranty.
   - Coating must be lead free Certificate of conformity must be included with each shipment.

   Part will be exposed to:
   - Outside weathering
   - Pressure treated wood
3. No burrs or sharp edges allowed.

China supplied part



Isometric View



Architectural Testing

Test sample complies with these details. Deviations are noted.

Report# C4472.01-119-19

Date 2/13/13 Tech RJB

TOLERANCES	
FRACTION	±1/64
XX	±0.01
XXX	±0.005
ANGLE	±1.0°
FINISH	125 RMS
UNLESS OTHERWISE SPECIFIED	

Barrette

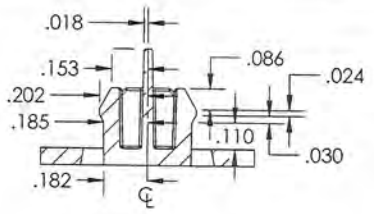
BARRETTE
Outdoor Living
740 N. Main St., Bulls Gap, TN 37711

DRAWN	DATE	APPROVED
W DIXON	2/1/2011	

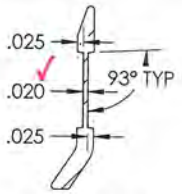
DESCRIPTION: POST INSTALL BOTTM PLATE W/ LIGHTNG HOLE

SHEET 1 OF 1	REVISION	PART NUMBER
SCALE 1:2	0	34106307
WEIGHT: 1.04		

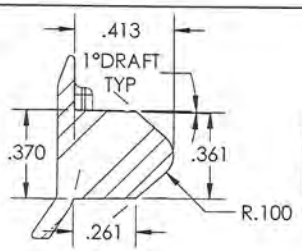
REV.	BY	DATE	PCR	DESCRIPTION



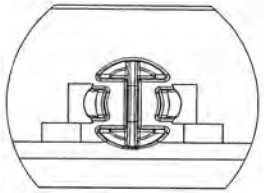
SECTION A-A
SCALE 2 : 1



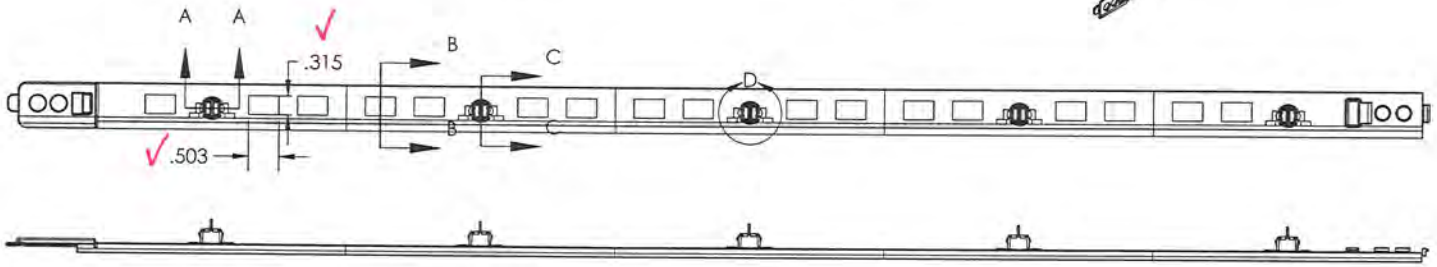
SECTION B-B
SCALE 2 : 1

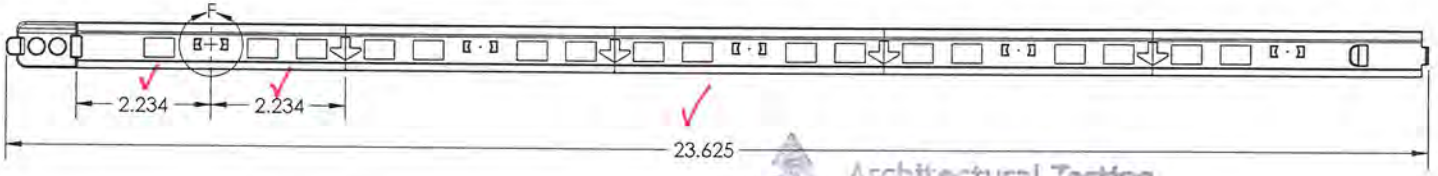


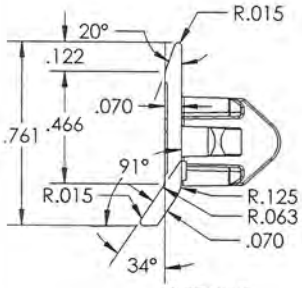
SECTION C-C
SCALE 2 : 1



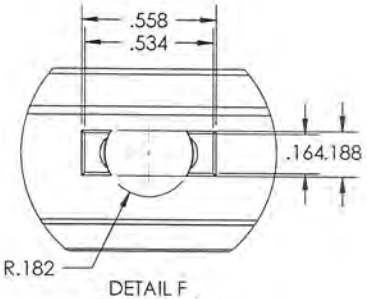
DETAIL D
SCALE 2 : 1







DETAIL E
SCALE 2 : 1



DETAIL F
SCALE 2 : 1

Architectural Testing

Tested in accordance with these details.
Dimensions are noted.

Report# C4472.01-119-19

Date 2/13/13 Tech KJB

Weight = 0.05 lbs
Material = PP/Glass 30%

TOLERANCES	
FRACTION	± 1/64"
XX	± 0.010"
XXX	± 0.005"
ANGLE	± 1°
UNSPECIFIED FINISH (u)	125 RMS
UNLESS OTHERWISE SPECIFIED	

No	NAME	DATE	DESCRIPTION
			REVISION

BUILT BY Barrette Outdoor Living
75 John B Brooks Rd
Pendergrass, Ga
30567
706-693-4062
706-693-4064 fax

DRAWN BY	DATE	SCALE
Ray Clark	11/15/2011	1:2

TITLE: CORIGIN STRIP WITH ENDS

PART No	SECTION	REVISION	DRAWING No
61104553	2 of 2	0	61104553

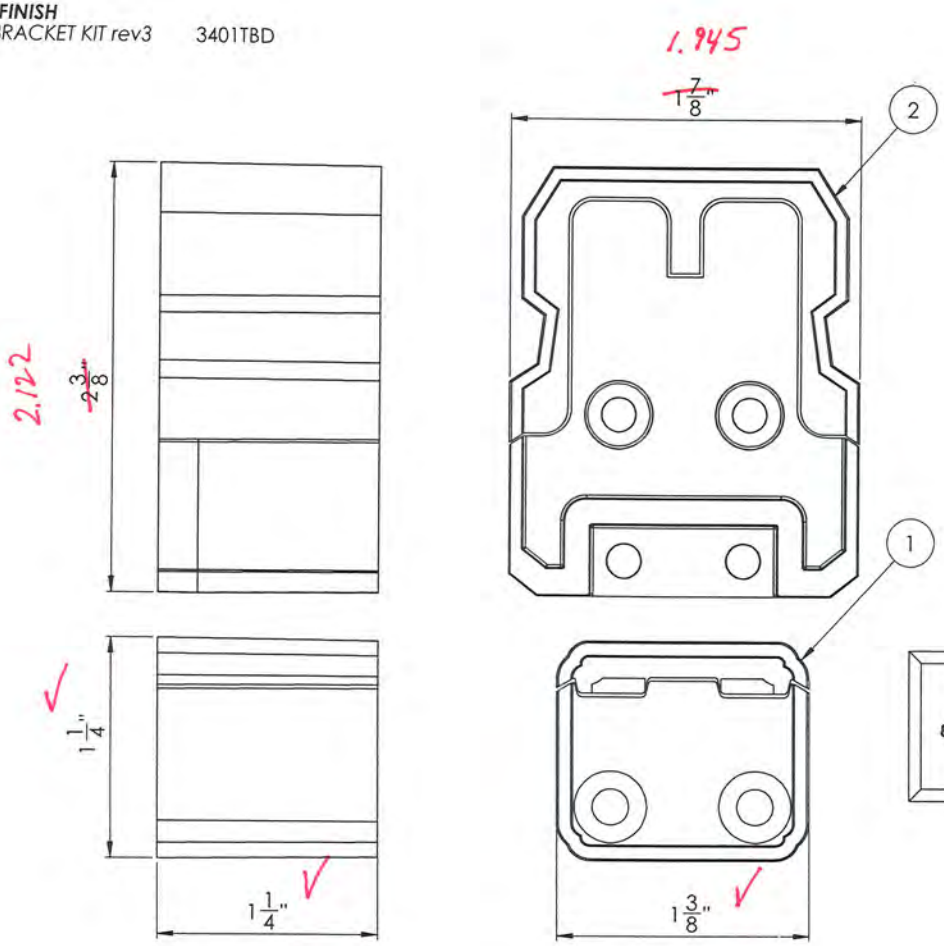
REFERENCE No

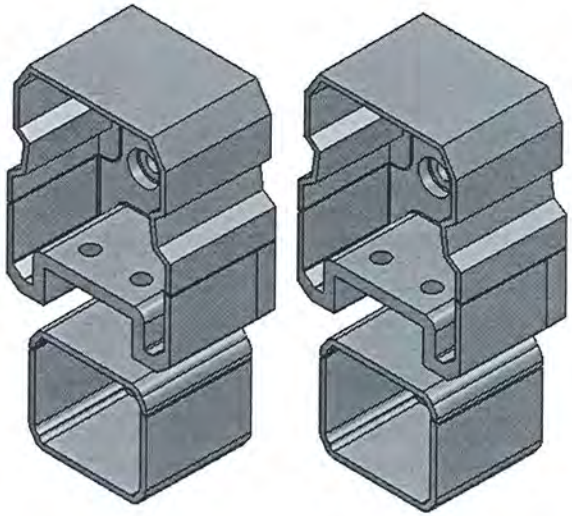
POWDER COAT OPTIONS

BLACK FINISH
VERSARAIL LINE BRACKET KIT rev3 3401TBD

WHITE FINISH
VERSARAIL LINE BRACKET KIT rev3 3401TBD

ITEM	DESCRIPTION	QTY.
1	LOWER LINE BRACKET W/COVERS	2
2	UPPER LINE BRACKET w/ COVERS rev3	2





LINE BRACKET SCREW KIT rev3

DESCRIPTION	QTY
8 x 1.5" Pan head square drive, self drilling screw, 410 stainless, 1000hr coating, powder coat head	16

BUILT BY Barrette Outdoor Living
75 John B Brooks Rd
Pendergrass, Ga
30567
706-693-4062
706-693-4064 fax

DRAWN BY:	DATE:	SCALE:
Ray Clark	2/5/2013	1.5:1

TITLE: LINE BRACKET KIT rev3

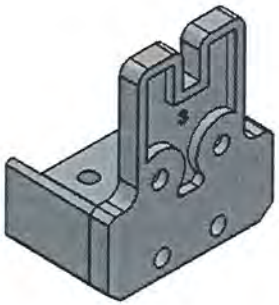
EQUIPMENT No:	SECTION:	REVISION	DRAWING No:
REFERENCE No:	1 of 1	1	Sheet1

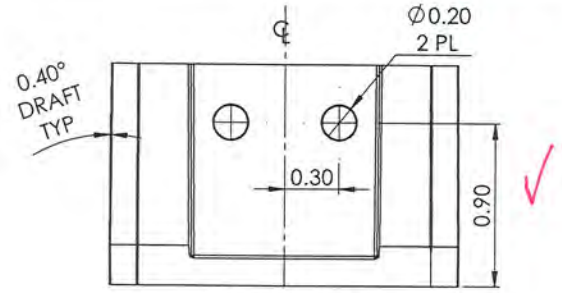
Architectural Testing

Test sample complies with these details. Deviations are noted.

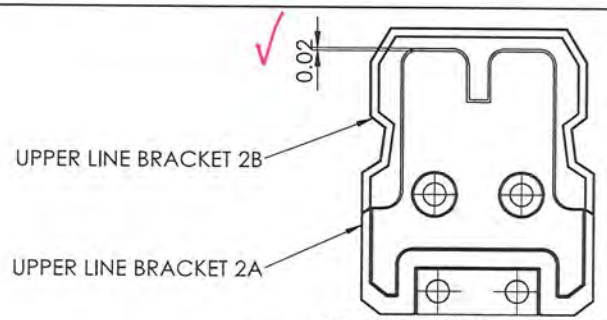
Report# C4472.01-119-19

Date 2/13/13 Tech KJB

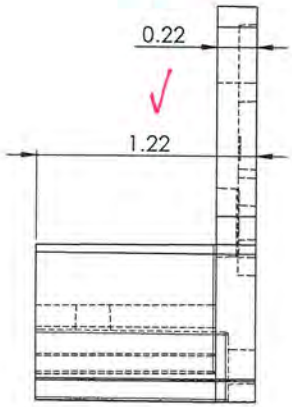




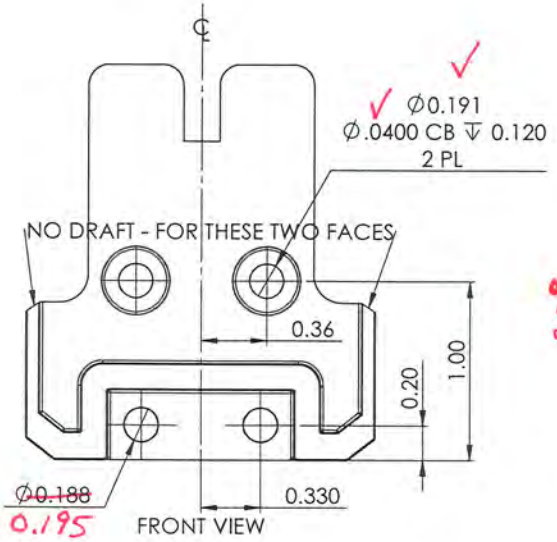
BOTTOM VIEW



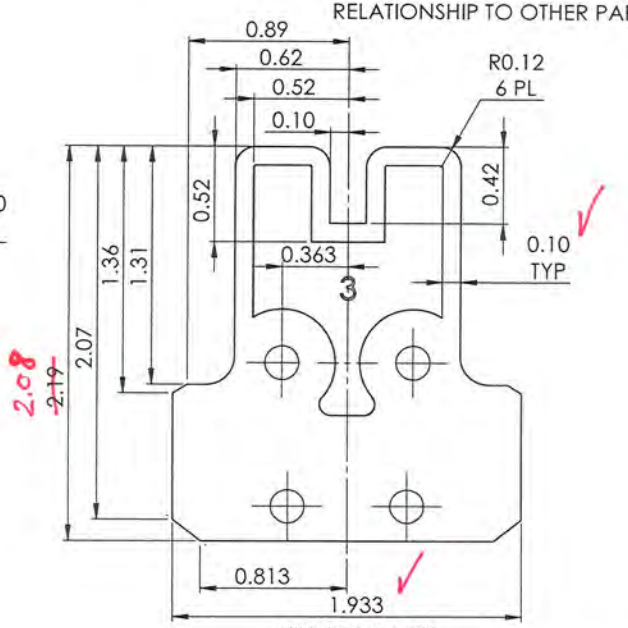
RELATIONSHIP TO OTHER PART



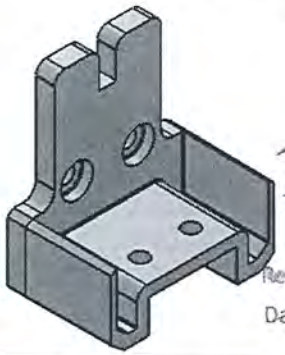
SIDE VIEW



FRONT VIEW



VIEW OF BACK



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# C4472.01-119-19

Date 2/13/13 Tech KSE

Weight = 0.1027 lbs
Material = AA380.0-F die Aluminum

TOLERANCES	
FRACTION	± 1/64"
XX	± 0.010"
XXX	± 0.005"
ANGLE	± 1°
UNSPECIFIED FINISH (µ")	125 RMS
UNLESS OTHERWISE SPECIFIED	

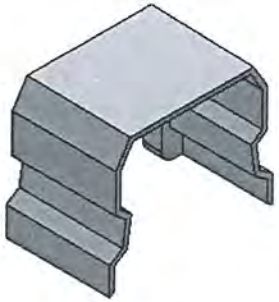
No	NAME	DATE	DESCRIPTION
REVISION			

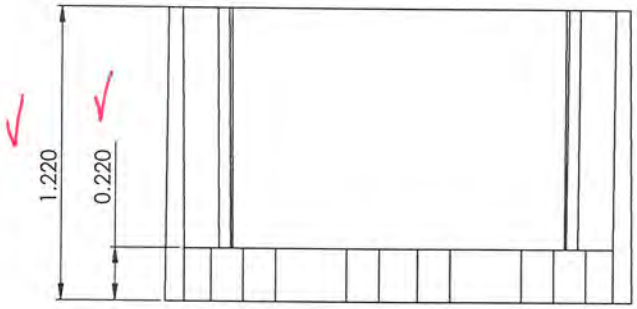
BUILT BY Barrette Outdoor Living
75 John B Brooks Rd
Pendergrass, Ga
30567
706-693-4062
706-693-4064 fax

DRAWN BY:	DATE:	SCALE:
Ray Clark	1/29/2013	1.5:1

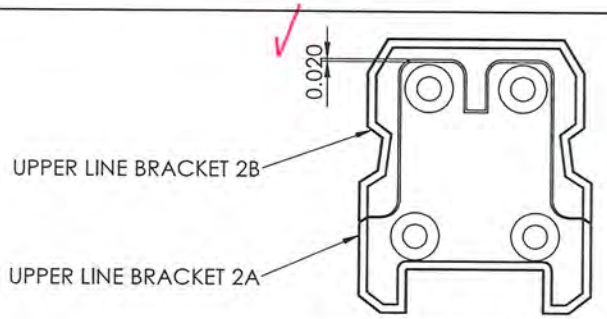
TITLE: UPPER LINE BRACKET 2A

EQUIPMENT No:	SECTION:	REVISION	DRAWING No:
REFERENCE No:	1 of 1	0	Sheet1

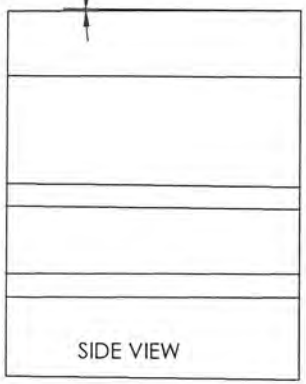


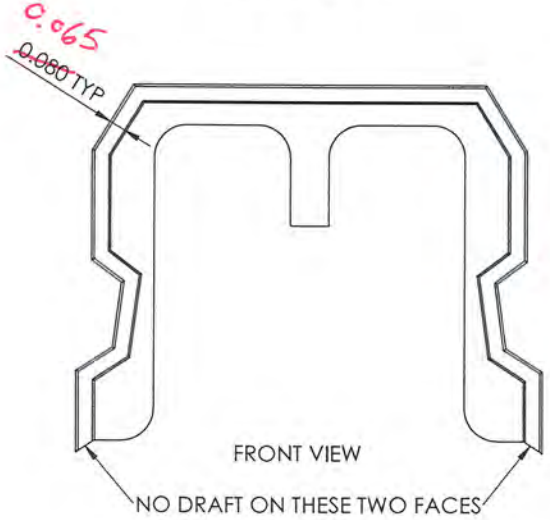


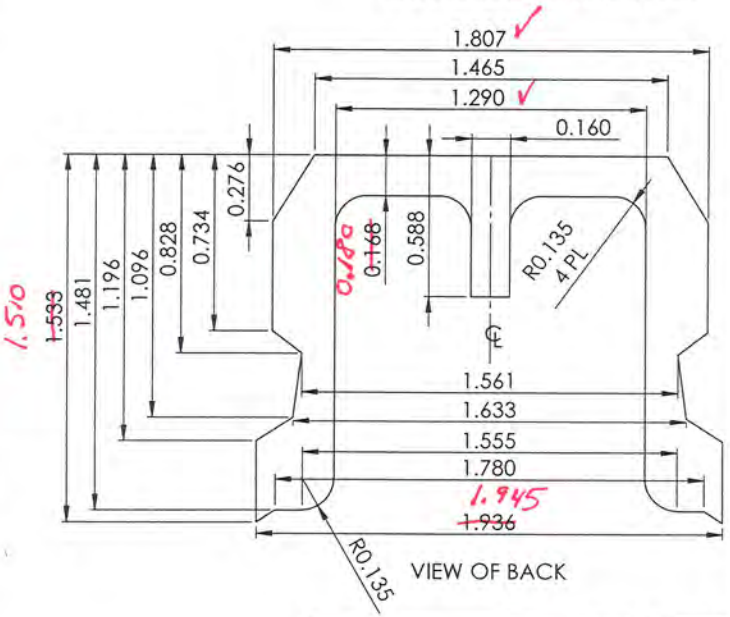
BOTTOM VIEW

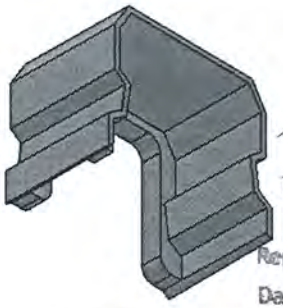


RELATIONSHIP TO OTHER PART









Architectural Testing

Test sample complies with these details. Deviations are noted.

Report# C4472.01-119-19

Date 2/13/13 Tech KJB

Weight = 0.0532 lbs
Material = AA380.0-F die Aluminum

TOLERANCES	
FRACTION	± 1/64"
XX	± 0.010"
XXX	± 0.005"
ANGLE	± 1°
UNSPECIFIED FINISH (µ")	125 RMS
UNLESS OTHERWISE SPECIFIED	

No	NAME	DATE	DESCRIPTION
1	RTC	2-5-13	Assembly model update to NBCC ver 3

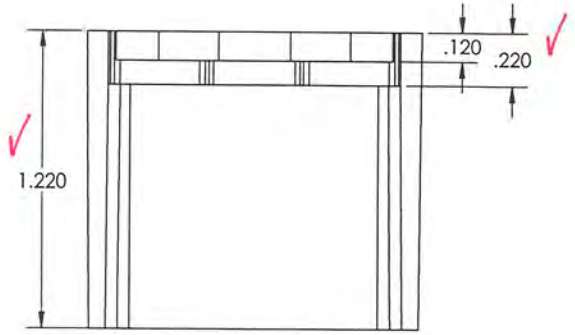
REVISION

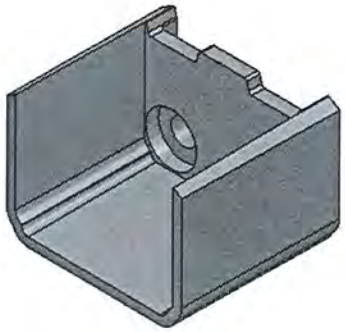
BUILT BY Barrette Outdoor Living
75 John B Brooks Rd
Pendergrass, Ga
30567
706-693-4062
706-693-4064 fax

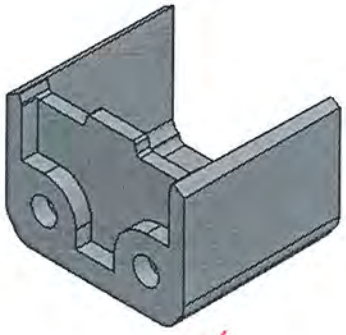
DRAWN BY	DATE	SCALE
Ray Clark	2/5/2013	2:1

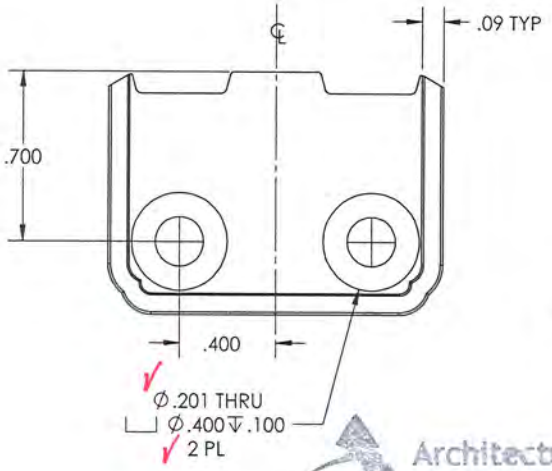
TITLE: UPPER LINE BRACKET 2B

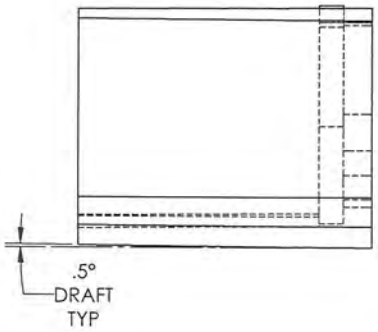
EQUIPMENT No:	SECTION:	REVISION	DRAWING No:
REFERENCE No:	1 of 1	1	Sheet1

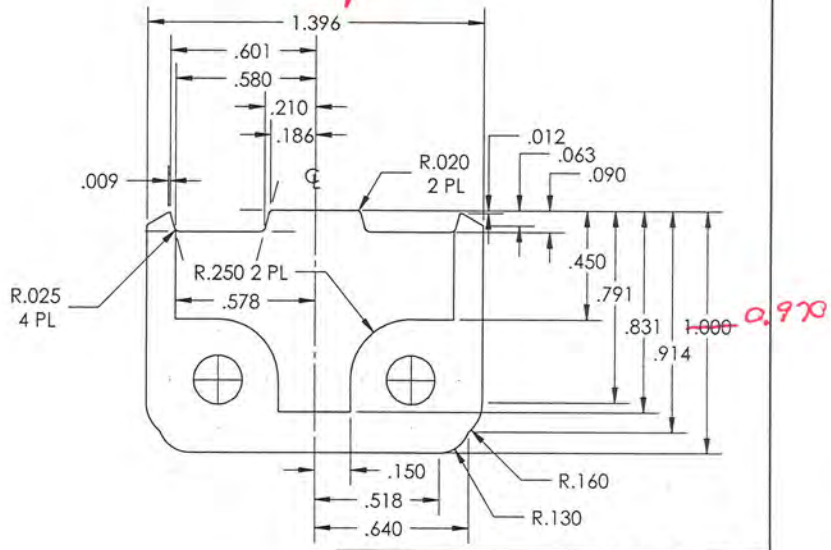












Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# C4472.01-119-19

Date 2/13/13 Tech KJE

Weight = 0.0413 lbs
Material = AA380.0-F die Aluminum

TOLERANCES	
FRACTION	± 1/64"
XX	± 0.010"
XXX	± 0.005"
ANGLE	± 1°
UNSPECIFIED FINISH (µ")	125 RMS
UNLESS OTHERWISE SPECIFIED	

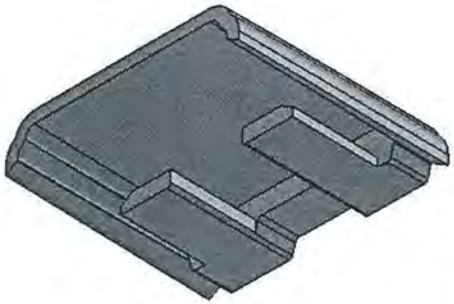
No	NAME	DATE	DESCRIPTION
REVISION			

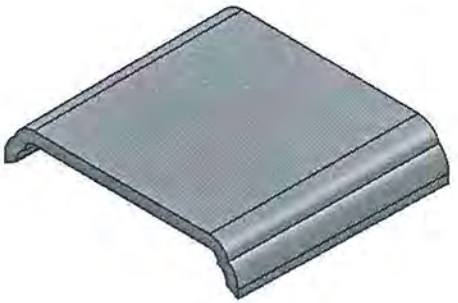
BUILT BY
Barrette Outdoor Living
75 John B Brooks Rd
Pendergrass, Ga
30567
706-693-4062
706-693-4064 fax

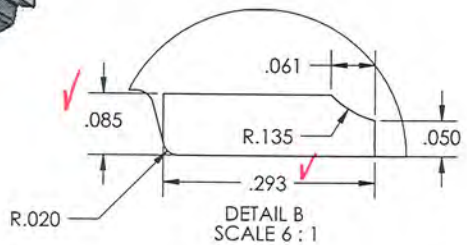
DRAWN BY:	DATE	SCALE:
Ray Clark	1/17/2012	2:1

TITLE: LOWER LINE BRACKET - BOTTOM

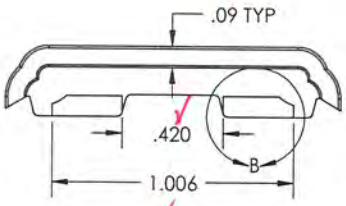
EQUIPMENT No:	SECTION:	REVISION	DRAWING No
REFERENCE No:	1 of 2	0	PART A

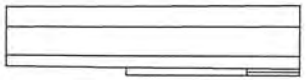


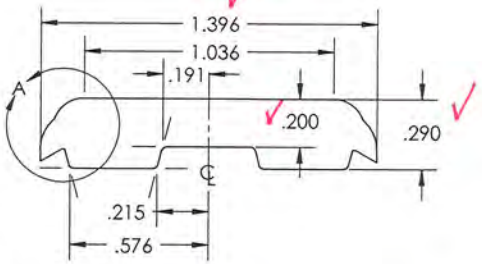


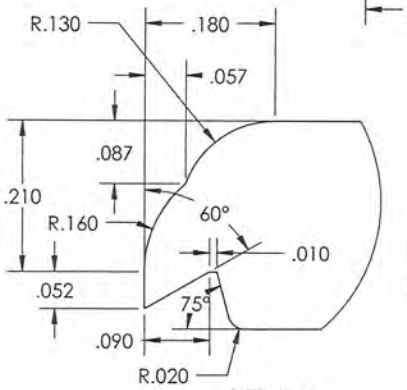


DETAIL B
SCALE 6 : 1

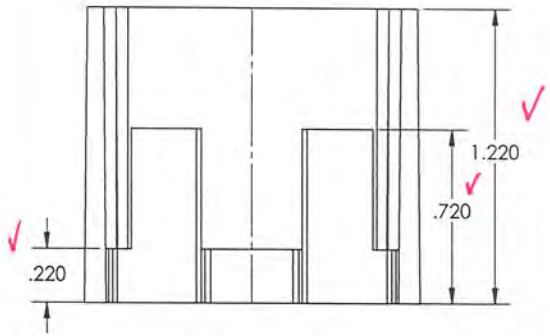








DETAIL A
SCALE 6 : 1



Weight = 0.0216 lbs
Material = AA380.0-F die Aluminum

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# C4472.01-119-19

Date 2/13/13 Tech KJB

TOLERANCES	
FRACTION	± 1/64"
XX	± 0.010"
XXX	± 0.005"
ANGLE	± 1°
UNSPECIFIED FINISH (µ")	125 RMS
UNLESS OTHERWISE SPECIFIED	

No.	NAME	DATE	DESCRIPTION

REVISION

BUILT BY
Barrette Outdoor Living

75 John B Brooks Rd
Pendergrass, Ga
30567
706-693-4062
706-693-4064 fax

DRAWN BY:	DATE	SCALE:
Ray Clark	1/17/2012	2:1

TITLE: LOWER LINE BRACKET - TOP

EQUIPMENT No:	SECTION:	REVISION	DRAWING No:
REFERENCE No:	2 of 2	0	PART B

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
Horizontal Uniform Load Test on Top Rail

Photo No. 4
Vertical Uniform Load Test on Top Rail

Photo No. 5
Concentrated Load Test at Ends of Top Rail (Brackets)

Photo No. 6
Concentrated Load Test at Top of Stand-Alone Post
(2 in Square Steel Post Mount with a 2-1/2 in Square Aluminum Post Sleeve)

Photo No. 7
Concentrated Load Test at Top of Stand-Alone Post
(2 in Square Steel Post Mount with 5 in Square PVC Post Sleeve with Internal Spacers)

Photo No. 8
Bracket Connection for Top Rail

Photo No. 9
Bracket Connection for Bottom Rail

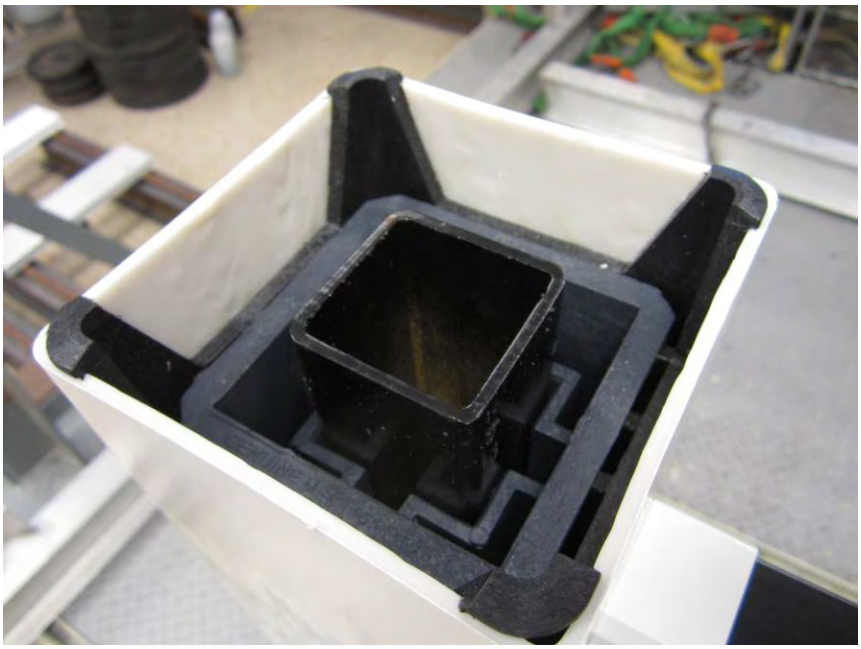


Photo No. 10
2 in Square Steel Post Mount with 5 in Square PVC Post Sleeve with Internal Spacers

Photo No. 11
Left to Right: Top Bracket and Bottom Bracket

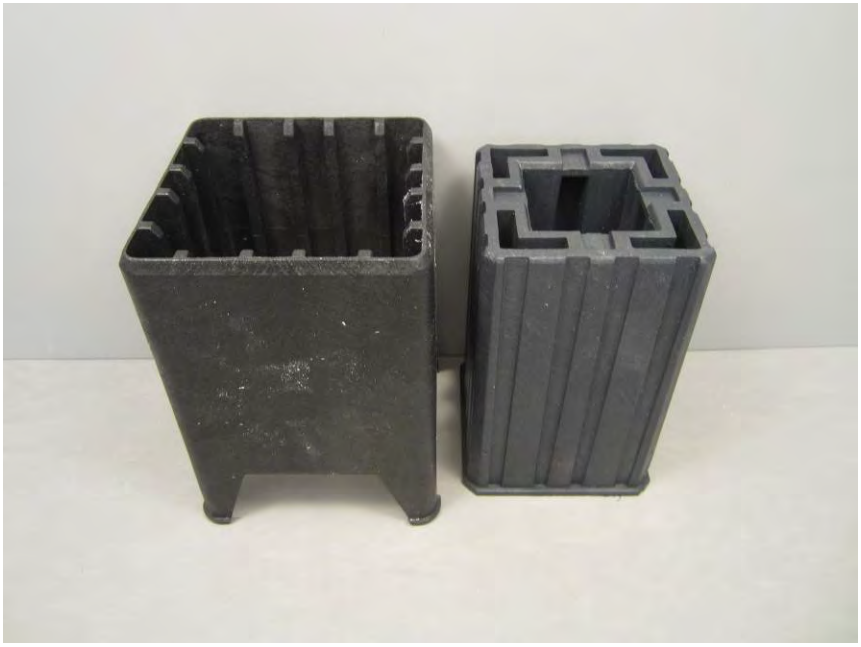


Photo No. 12
PVC Post Sleeve - Top and Bottom Internal Spacers