

**AAMA 1503-09 THERMAL PERFORMANCE  
TEST REPORT**

**Rendered to:**

**UNITED STATES ALUMINUM**

**SERIES/MODEL: TT451 Top Notch Ribbon Wall**

**TYPE: Glazed Wall Systems (Site-built)**

<b>Summary of Results</b>	
Thermal Transmittance (U-Factor)	0.42
Condensation Resistance Factor - Frame (CRF <sub>f</sub> )	68
Condensation Resistance Factor - Glass (CRF <sub>g</sub> )	64
Unit Size	79" x 79" (2007 mm x 2007 mm)
Layer 1	1/4" TiAC-36 Low-E (e=0.034*, #2)
Gap 1	0.50" Gap, Aluminum Spacer (A1-D), 100% Air-Filled*
Layer 2	1/4" Clear

Reference must be made to Report No. B6094.02-201-46, dated 09/10/12 for complete test specimen description and data.

**AAMA 1503-09 THERMAL PERFORMANCE TEST REPORT**

Rendered to:

UNITED STATES ALUMINUM  
200 Singleton Drive  
Waxahachie, Texas 75165

Report Number: B6094.02-201-46  
Test Date: 07/17/12  
Report Date: 09/10/12  
Test Record Retention Date: 07/17/16

**Test Sample Identification:**

**Series/Model:** TT451 Top Notch Ribbon Wall

**Type:** Glazed Wall Systems (Site-built)

**Test Sample Submitted by:** Client

**Test Procedure:** The condensation resistance factor (CRF) and thermal transmittance (U) were determined in accordance with AAMA 1503-09, *Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections*

- |   |         |
|---|---------|
| 1. Average warm side ambient temperature                  | 69.79 F |
| 2. Average cold side ambient temperature                  | -0.42 F |
| 3. 15 mph dynamic wind applied to test specimen exterior. |         |
| 4. 0.0" $\pm$ 0.04" static pressure drop across specimen. |         |

**Test Results Summary:**

- |  |      |
|--|------|
| 1. Condensation resistance factor - Frame (CRF <sub>f</sub> )  | 68   |
| Condensation resistance factor - Glass (CRF <sub>g</sub> )   | 64   |
| 2. Thermal transmittance due to conduction (U)<br>(U-factors expressed in Btu/hr·ft <sup>2</sup> ·F) | 0.42 |

**Test Sample Description:**

<b>CONSTRUCTION</b>	<b>Frame</b>
Size (in.)	79 x 79
Daylight Opening (in.)	36 x 74 (x2)
<b>CORNERS</b>	Square Cut
Fasteners	Screws
Sealant	No
<b>MATERIAL</b>	AT (0.22")
Color Exterior	White
Finish Exterior	Paint
Color Interior	White
Finish Interior	Paint
<b>GLAZING METHOD</b>	Interior

**Glazing Information:**

<b>Layer 1</b>	1/4" TiAC-36 Low-E (e=0.034*, #2)
<b>Gap 1</b>	0.50" Gap, Aluminum Spacer (A1-D), 100% Air-Filled*
<b>Layer 2</b>	1/4" Clear
<b>Gas Fill Method</b>	N/A
<b>Desiccant</b>	Yes

*\*Stated per Client/Manufacturer*

*NA Non-Applicable*

*See Description Table Abbreviations*

**Test Sample Description:** (Continued)

<b>COMPONENTS</b>		
<b>Type</b>	<b>Quantity</b>	<b>Location</b>
<b>WEATHERSTRIP</b>		
No weatherstrip		
<b>HARDWARE</b>		
No hardware		
<b>DRAINAGE</b>		
No drainage		

**Test Duration:**

1. The environmental systems were started at 12:00 hours, 07/16/12.
2. The thermal performance test results were derived from 00:32 hours, 07/17/12 to 04:32 hours, 07/17/12.

**Condensation Resistance Factor (CRF):**

The following information, condensed from the test data, was used to determine the condensation resistance factor:

$T_h$	=	Warm side ambient air temperature	69.79 F
$T_c$	=	Cold side ambient air temperature	-0.42 F
$FT_p$	=	Average of pre-specified frame temperatures (14)	47.57 F
$FT_r$	=	Average of roving thermocouples (4)	40.62 F
$W$	=	$[(FT_p - FT_r) / (FT_p - (T_c + 10))]$ x 0.40	0.073
$FT$	=	$FT_p(1-W) + W (FT_r)$ = Frame Temperature	47.06 F
$GT$	=	Glass Temperature	44.39 F
$CRF_g$	=	Condensation resistance factor – Glass	64
		$CRF_g = (GT - T_c) / (T_h - T_c) \times 100$	
$CRF_f$	=	Condensation resistance factor – Frame	68
		$CRF_f = (FT - T_c) / (T_h - T_c) \times 100$	

The CRF number was determined to be 64 (on the size as reported). When reviewing this test data, it should be noted that the glass temperature (GT) was colder than the frame temperature (FT) therefore controlling the CRF number. Refer to the 'CRF Report' page and the 'Thermocouple Location Diagram' page of this report.

**Thermal Transmittance ( $U_c$ ):**

$T_h$	= Average warm side ambient temperature	69.79 F
$T_c$	= Average cold side ambient temperature	-0.42 F
P	= Static pressure difference across test specimen 15 mph dynamic perpendicular wind at exterior	0.00 psf
	Nominal sample area	43.34 ft <sup>2</sup>
	Total measured input to calorimeter	1404.88 Btu/hr
	Calorimeter correction	115.91 Btu/hr
	Net specimen heat loss	1288.97 Btu/hr
U	= Thermal Transmittance	0.42 Btu/hr·ft <sup>2</sup> ·F

**Glazing Deflection (in.):**

	Left Glazing	Right Glazing
Edge Gap Width	0.50	0.50
Estimated center gap width upon receipt of specimen in laboratory (after stabilization)	0.40	0.40
Center gap width at laboratory ambient conditions on day of testing	0.40	0.40
Center gap width at test conditions	0.40	0.40

The sample was inspected for the formation of frost or condensation, which may influence the surface temperature measurements. The sample showed no evidence of condensation/frost at the conclusion of the test.

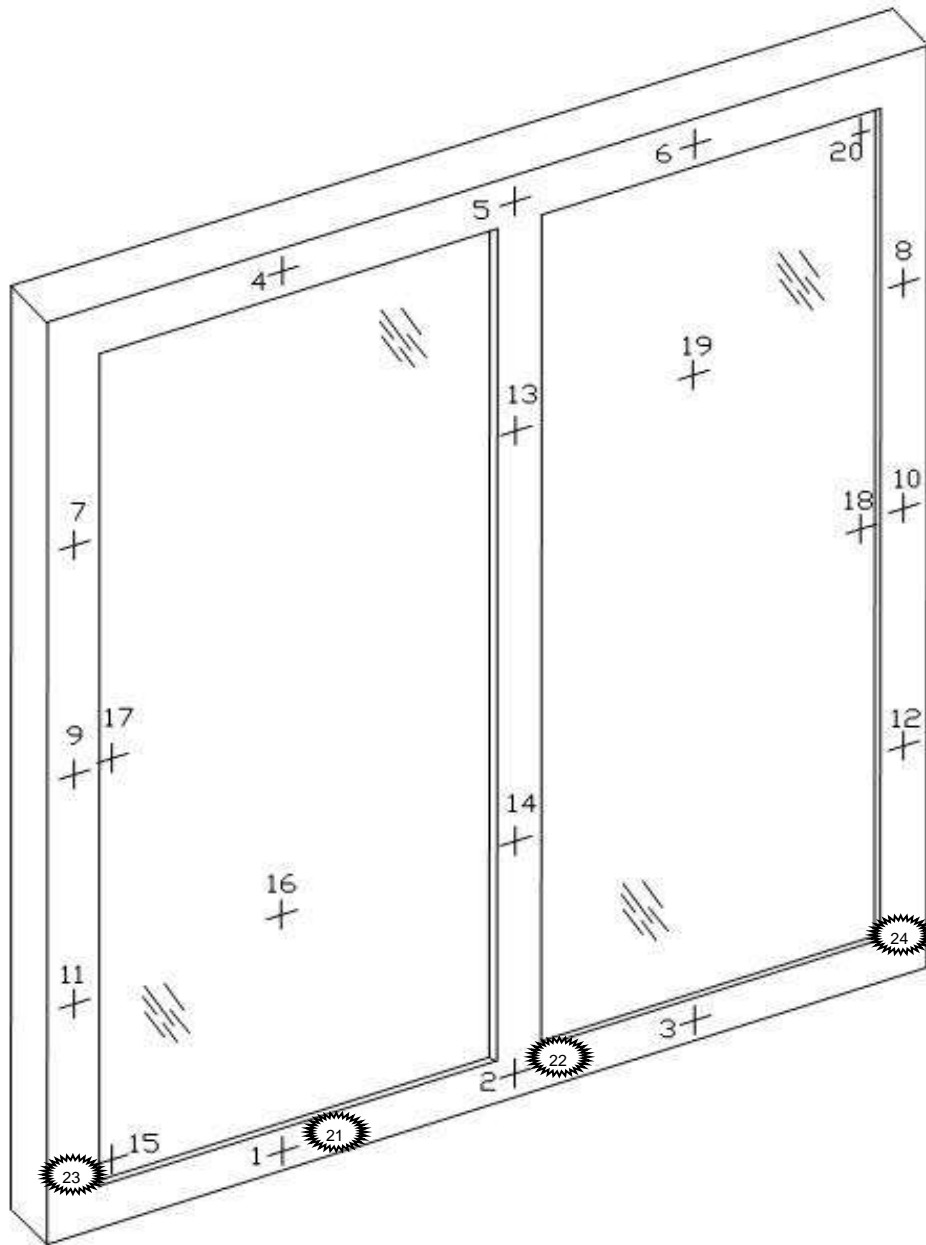
A calibration of the Architectural Testing Inc. 'thermal test chamber' (ICN N000235) in St. Paul, Minnesota was conducted in October 2011 in accordance with Architectural Testing Inc. calibration procedure.

Prior to testing the specimen was sealed with silicone on the interior side and checked for air infiltration per Section 9.3.4.





**CRF Report**

Time:	02:32	03:02	03:32	04:02	04:32	AVERAGE
<b>Pre-specified Thermocouples - Frame</b>						
1	39.90	39.91	39.91	39.95	39.96	39.93
2	41.64	41.70	41.69	41.67	41.70	41.68
3	42.34	42.35	42.38	42.36	42.40	42.37
4	50.21	50.20	50.24	50.23	50.24	50.22
5	50.21	50.20	50.24	50.23	50.24	50.22
6	50.66	50.68	50.66	50.71	50.69	50.68
7	49.00	49.00	49.01	49.01	49.00	49.00
8	50.06	50.06	50.09	50.06	50.10	50.07
9	48.12	48.12	48.10	48.12	48.13	48.12
10	48.30	48.39	48.38	48.33	48.36	48.35
11	47.08	47.07	47.06	47.07	47.08	47.07
12	46.30	46.34	46.31	46.30	46.33	46.32
13	52.78	52.73	52.67	52.76	52.55	52.70
14	49.18	49.19	49.19	49.17	49.20	49.18
FT <sub>p</sub>	47.56	47.57	47.57	47.57	47.57	47.57
<b>Pre-specified Thermocouples - Glass</b>						
15	36.40	36.42	36.53	36.47	36.47	36.46
16	53.69	53.65	53.70	53.69	53.70	53.69
17	40.68	40.68	40.68	40.67	40.69	40.68
18	40.86	40.85	40.83	40.85	40.83	40.85
19	53.47	53.50	53.43	53.45	53.47	53.46
20	41.21	41.20	41.20	41.22	41.26	41.22
GT	44.38	44.38	44.40	44.39	44.40	44.39
<b>Cold Point (Roving) Thermocouples</b>						
21	39.90	39.91	39.91	39.95	39.96	39.93
22	41.64	41.70	41.69	41.67	41.70	41.68
23	41.57	41.58	41.60	41.65	41.58	41.60
24	39.23	39.25	39.30	39.30	39.27	39.27
FT <sub>R</sub>	40.59	40.61	40.62	40.64	40.63	40.62
W	0.07	0.07	0.07	0.07	0.07	0.07
FT	47.05	47.06	47.06	47.07	47.06	47.06
<b>Warm Side - Room Ambient Air Temperature</b>						
	69.80	69.80	69.80	69.81	69.81	69.80
<b>Cold Side - Room Ambient Air Temperature</b>						
	-0.44	-0.28	-0.34	-0.76	-0.35	-0.43
CRF <sub>f</sub>	68	68	68	68	68	68
CRF <sub>g</sub>	64	64	64	64	64	64

Thermocouple Location Diagram



Cold Point Locations

	21. 39.93
	22. 41.68
	23. 41.60
	24. 39.27



Detailed drawings, data sheets, representative samples of test specimens, a copy of this report, or other pertinent project documentation will be retained by Architectural Testing, Inc. for a period of four years from the original test date. At the end of this retention period such materials shall be discarded without notice and the service life of this report by Architectural Testing will expire. Results obtained are tested values and were secured by 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 specimen(s) tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.

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Michael D. Topitzhofer  
Technician

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Michael P. Resech  
Senior Project Manager  
Individual-In-Responsible-Charge

MDT:mdt  
B6094.02-201-46

Attachments (pages): This report is complete only when all attachments listed are included.

Appendix-A: Description Table Abbreviations (1)

Appendix-B: Submittal Form and Drawings (10)

### Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
02-R0	09/10/12	All	Original Report Issue. Work requested by Mr. Don Willard of United States Aluminum.

## Appendix A: Description Table Abbreviations

CODE	Frame / Sash Types
AI	Aluminum w/ Vinyl Inserts (Caps)
AL	Aluminum
AP	Aluminum w/ Thermal Breaks - Partial
AS	Aluminum w/ Steel Reinforcement
AT	Aluminum w/ Thermal Breaks - All Members (> 0.21")
AU	Aluminum Thermally Improved - All Members (0.062" - 0.209")
AV	Aluminum / Vinyl Composite
AW	Aluminum-clad Wood
FG	Fiberglass
PA	ABS Plastic w/ All Members Reinforced
PC	ABS Plastic-clad Aluminum
PF	ABS Plastic w/ Foam-filled Insulation
PH	ABS Plastic w/ Horizontal Members Reinforced
PI	ABS Plastic w/ Reinforcement - Interlock
PL	ABS Plastic
PP	ABS Plastic w/ Reinforcement - Partial
PV	ABS Plastic w/ Vertical Members Reinforced
PW	ABS Plastic-clad Wood
ST	Steel
VA	Vinyl w/ All Members Reinforced
VC	Vinyl-clad Aluminum
VF	Vinyl w/ Foam-filled Insulation
VH	Vinyl w/ Horizontal Members Reinforced
VI	Vinyl w/ Reinforcement - Interlock
VP	Vinyl w/ Reinforcement - Partial
VV	Vinyl w/ Vertical Members Reinforced
VW	Vinyl-clad Wood
VY	Vinyl
WA	Aluminum / Wood composite
WD	Wood
WV	Vinyl / Wood composite
WF	Fiberglass/Wood Combination
WC	Composite/Wood Composite (Shaped vinyl/wood composite members)
CW	Copper Clad Wood
CO	Vinyl/Wood Composite Material

CODE	Spacer Types (See sealant)
A1	Aluminum
A2	Aluminum (Thermally-broken)
A3	Aluminum-reinforced Polymer
A4	Aluminum / Wood
A5	Aluminum-reinforced Butyl (Swiggle)
A6	Aluminum / Foam / Aluminum
A7	Aluminum U-shaped
A8	Aluminum-Butyl (Corrugated) (Duraseal)
ER	EPDM Reinforced Butyl
FG	Fiberglass
GL	Glass
OF	Organic Foam
P1	Duralite
PU	Polyurethane Foam
SU	Stainless Steel, U-shaped
CU	Coated Steel, U-shaped (Intercept)
S2	Steel (Thermally-broken)
S3	Steel / Foam / Steel
S5	Steel-reinforced Butyl
S6	Steel U-channel w/ Thermal Cap
SS	Stainless Steel
CS	Coated Steel
TP	Thermo-plastic
WD	Wood
ZE	Elastomeric Silicone Foam
ZF	Silicone Foam
ZS	Silicone / Steel
N	Not Applicable
TS	Thermo-plastic w/ stainless steel substrate

CODE	Tint Codes
AZ	Azurlite
BL	Blue
BZ	Bronze
CL	Clear
EV	Evergreen
GD	Gold
GR	Green
GY	Gray
LE	Low 'e' Coating
OT	Other (use comment field)
RC	Solar or Reflective Coating
RG	Roller Shades between glazing
RS	Silver (reflective coating)
SF	Suspended Polyester Film
SR	Silver
BG	Blinds between the Glazing
DV	Dynamic Glazing-Variable
DY	Dynamic Glazing-NonVariable

CODE	Gap Fill Codes
AIR	Air
AR2	Argon/Krypton Mixture
AR3	Argon / Krypton / Air
ARG	Argon/Air
CO2	Carbon Dioxide
KRY	Krypton/Air
SF6	Sulfur Hexafluoride
XE2	Xenon/Krypton/Air
XE3	Xenon/Argon/Air
XEN	Xenon/Air
N	Not Applicable

DOOR DETAILS	
N	Not Applicable
CODE	Door Type
EM	Embossed
FL	Flush
LF	Full Lite
LH	1/2 - Lite
LQ	1/4 - Lite
LT	3/4 - Lite
RP	Raised Panel
CODE	Skin
AL	Aluminum
FG	Fiberglass
GS	Galvanized Steel
ST	Steel
WD	Wood
VY	Vinyl
CODE	Panel
FG	Fiberglass
PL	Plastic
WP	Wood - Plywood
WS	Wood - Solid
CODE	Sub-Structure
GS	Galvanized Steel
ST	Steel
WD	Wood
VY	Vinyl
CODE	Core Fill
CH	Cellular - Honeycomb
EP	Expanded Polystyrene
PI	Polyisocyanurate
PU	Polyurethane
WP	Wood - Plywood
WS	Wood - Solid
XP	Extruded Polystyrene

CODE	Spacer Sealant
D	Dual Seal Spacer System
S	Single Seal Spacer System

CODE	Grid Description
N	No Muntins
G	Grids between glass
S	Simulated Divided Lites
T	True Muntins

CODE	Grid Size Codes
	Blank for no grids
0.75	Grids < 1"
1.5	Grids >= 1"

CODE	Thermal Breaks
F	Foam
U	Urethane
V	Vinyl
FB	Fiberglass
O	Other
AB	ABS
NE	Neoprene
AI	Air
N	Not Applicable
P	Polvamide

## **Appendix B: Drawings**

## NFRC PRODUCT CERTIFICATION PROGRAM

### Submittal Form for Test Samples

For use by manufacturers, lineal suppliers and fabricators



National Fenestration  
Rating Council®

1. Information on Production of the Test Sample (complete ALL fields):

Manufacturer: US Aluminum Date of sample manufacture: 08 of 2012

Plant Address where manufactured: 200 Singleton Dr.

City: Waxahachie State: TX Zip Code: 75165

Name of IA: ALI Phone: 214-565-0593 Fax: \_\_\_\_\_

2. Product Information (complete ALL fields):

Product Line ID (CPD) No.: \_\_\_\_\_ Product/Operator Type  
(Table 4-3 of NFRC 100): NEW

Series/Model : TT451 / TT601 Top Notch Ribbon Wall

3. Test sample is being submitted for (select ONE):

- a.  Validation for Initial Certification (prototype only) no plant qualification
- b.  Validation for Initial Certification (production line unit) & plant qualification
- c.  Validation for Recertification (production line unit) & plant qualification
- d.  Plant Qualification Only (production line unit)

I, Don Willard, as the designated agent for US Aluminum

do hereby attest that the foregoing information is true to the best of my information, knowledge, and belief. Further, if the unit is identified in Section 3 as a production line unit, I hereby authorize the NFRC-accredited testing laboratory to send a copy of the test report to the IA identified above for plant qualification purposes pursuant to the NFRC Product Certification Program.

Signature: Don Willard Date: 09.10.12

#### FOR LABORATORY USE ONLY

1. Laboratory: Architectural Testing, Inc.

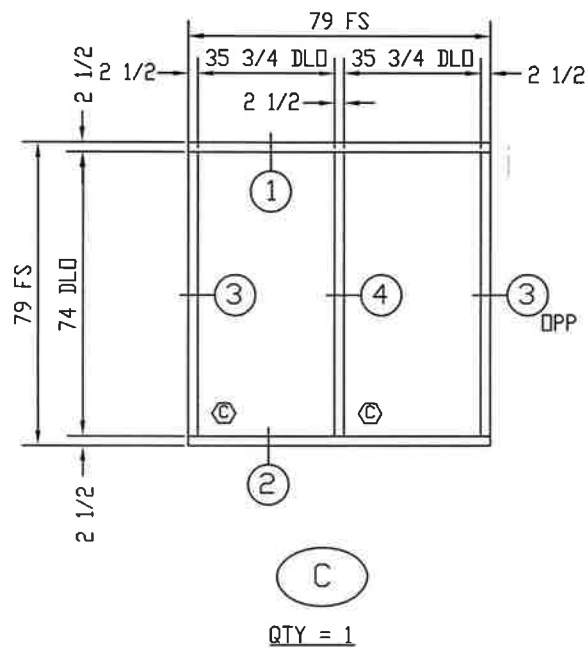
2. Date Sample Received: 7-2-12 File number ID: 36094

3. Date Sample Tested: 7-17-12 By: Mike Topitzhofer

4. Modifications made: \_\_\_\_\_

5. Reason for non-testing of sample unit: \_\_\_\_\_

[Note: If the sample submitted can not be tested due to damage prior to testing, a new sample and new form shall be submitted to the testing laboratory. Both forms shall be submitted to the IA when the testing is completed.]



Test sample complies with these details.  
Deviations are noted.

Report# B6094  
Date 9/11/12 Tech ATB



200 E. 5TH STREET  
FRESNO, CA 93701  
PHONE: (559) 444-1151 FAX: (559) 444-2591

DEVISION UNITED STATES: ALUMINUM

SYMBOL KEY			
SYMBOL	DESCRIPTION	QTY	COMMENTS
Ⓢ	36.625 X 74.875	2	1 INS = INSULATED GLASS

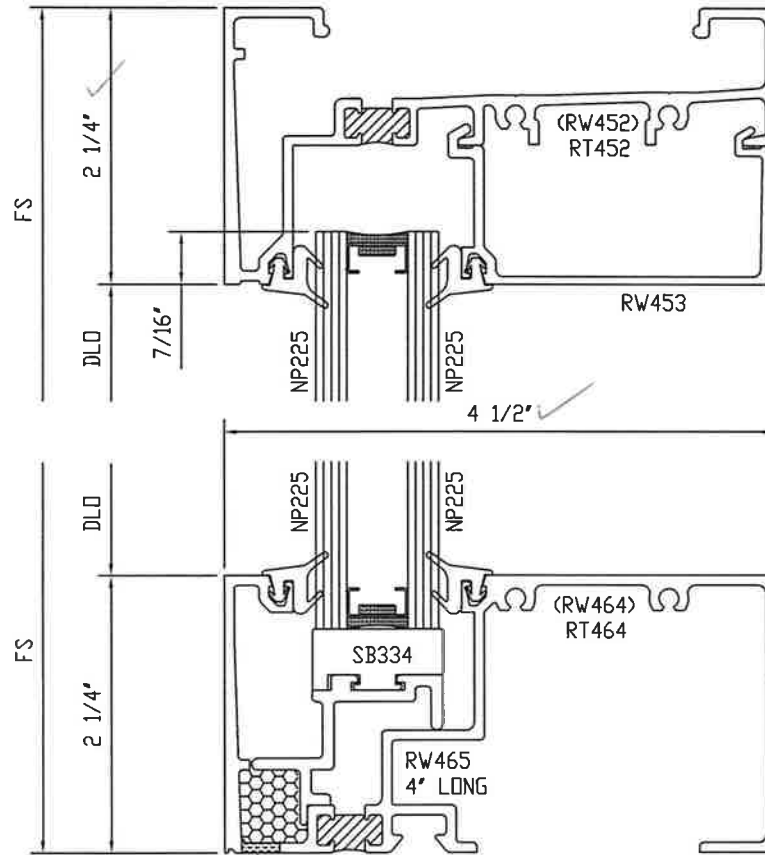
REV	REV_DESCRIPTION	DATE	XXX

DCW	12/23/2011
3/8"=1"	


THERMAL_TEST_NFRC_AAMA_1503	DWG NO
SERIES_TT451	MU2011-003-01

1

2

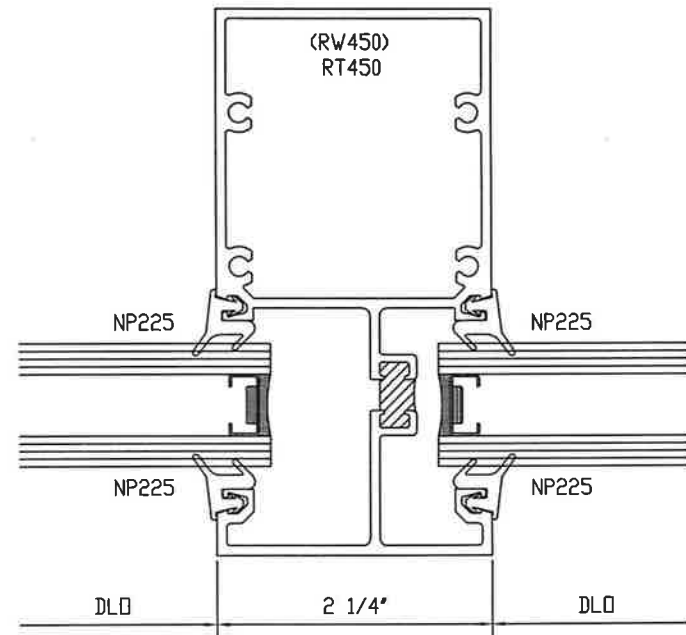
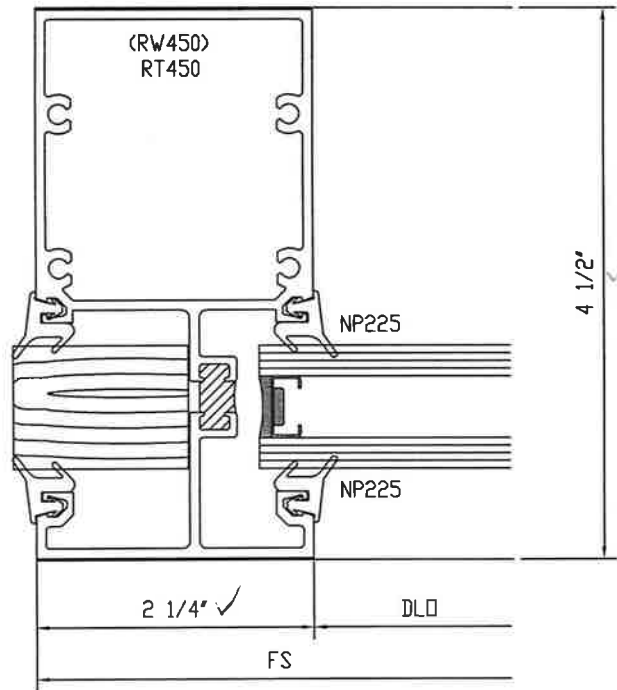


5/16" DIA WEEP  
W/UB625 BAFFLE

 Architectural Testing  
Test sample complies with these details.  
Deviations are noted.

Report# B6094  
Date 9/10/11 Tech HB

				<b>CNL</b>		<small>2001 1000 1000 1000 1000 1000 PHONE 202 241-1144 FAX 202 241-1123</small>	
				DIVISION		UNITED STATES AIR FORCE	
				DCW		THERMAL_TEST_NFRC_AAMA_1503	
				12/23/2011		DWG NO	
				FULL		SERIES_TT451	
						MU2011-003-02	



3



Architectural Testing

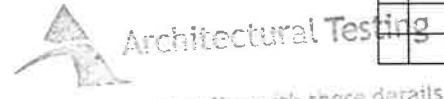
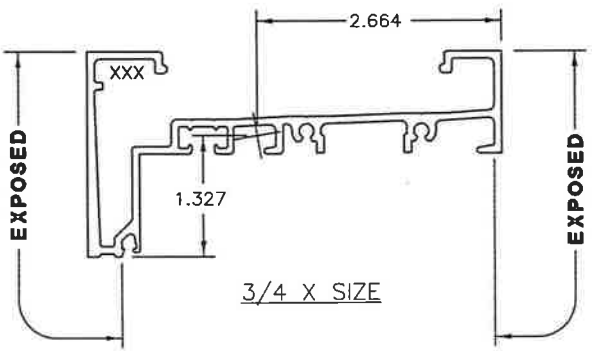
Test sample complies with these details.  
Deviations are noted.

Report#: B6094  
Date: 9/10/12 Tech: HSB

4

				<b>CNL</b>			
				NEW YORK    MOUNTAIN STATE    ALUMINUM			
				DCW		THERMAL_TEST_NFRC_AAMA_1503	
REV		REV_DESCRIPTION		DATE		XXX	
				12/23/2011			
				FULL			
				SERIES_TT451		MU2011-003-03	



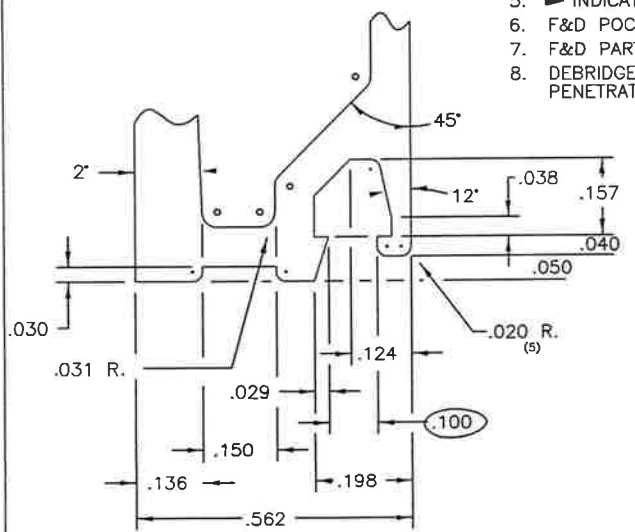
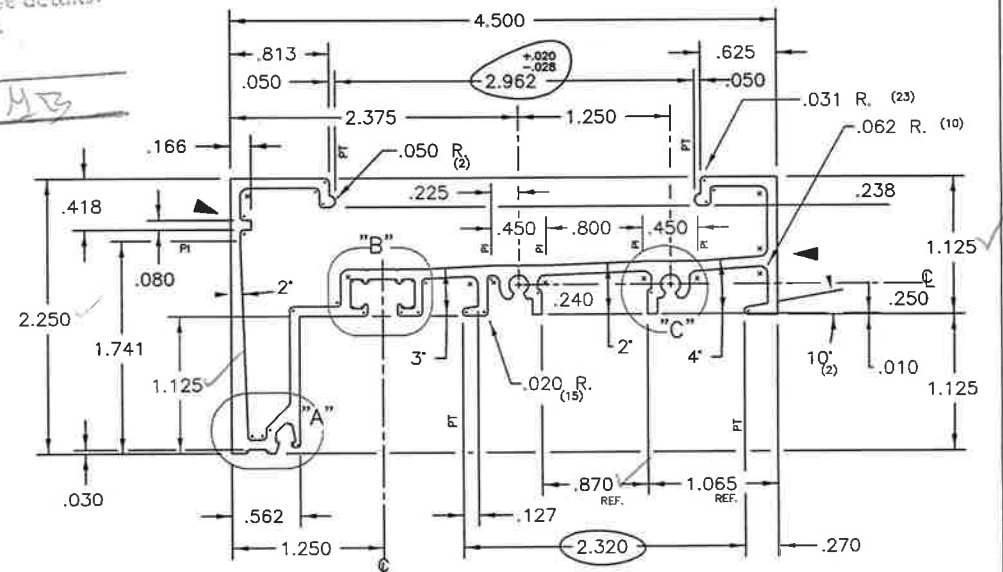


Test sample complies with these details.  
Deviations are noted.

Report# BLO94  
Date 9/10/11 Tech MB

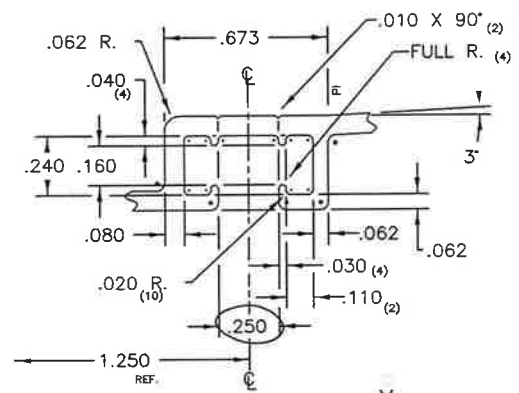
UNITED STATES ALUMINUM CORP.		T-60605
HEAD	GLH	10-26-00
RW452	FULL SIZE	

- NOTES:**
- 6063-T5 ALLOY AND TEMPER
  - PAINT PERIMETER = 3.741"
  - XXX INDICATES I.D. MARK FOR IEC-TX
  - MATES WITH RW443 DIE#  
RW453; DIE#60606  
RW250; DIE#60598  
RW260; DIE#60600
  - ▶ INDICATES POSSIBLE STREAKING
  - F&D POCKET AREA = .130"
  - F&D PART NUMBER: RT452
  - DEBRIDGE WITH A .218 X .015 MAX PENETRATION INTO THERMAL AREA

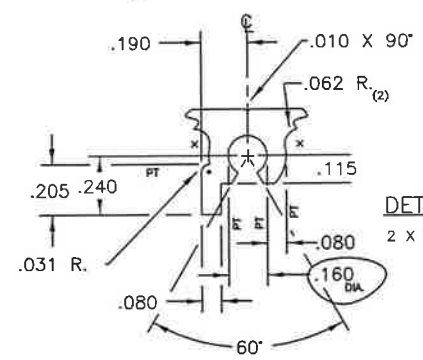


**DETAIL "A"**  
4 X SIZE

4 1/2" TOP NOTCH



**DETAIL "B"**  
2 X SIZE



**DETAIL "C"**  
2 X SIZE (2) PLACES

**SECTION PROPERTIES**

I <sub>xx</sub> = 2.933	in <sup>4</sup>
S <sub>xx</sub> = 1.097	in <sup>3</sup>
I <sub>yy</sub> = 0.370	in <sup>4</sup>
S <sub>yy</sub> = 0.279	in <sup>3</sup>

	1.132	100437	
	1.358	5.031	
	26.404	SOLID	
	19		T-60605

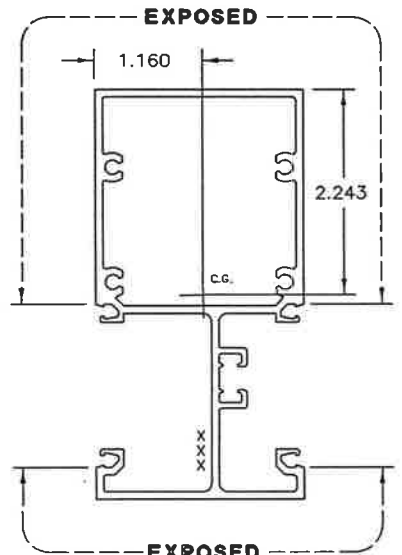
UNITED STATES ALUMINUM CORP.

H-60603

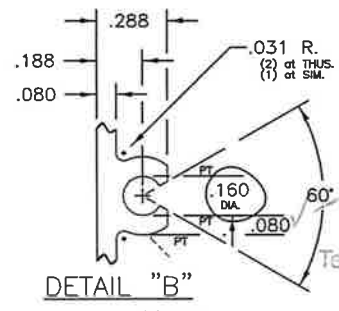
VERT. MULLION  
RW450

GLH  
FULL SIZE

10-26-00



EXPOSED  
3/4 X SIZE

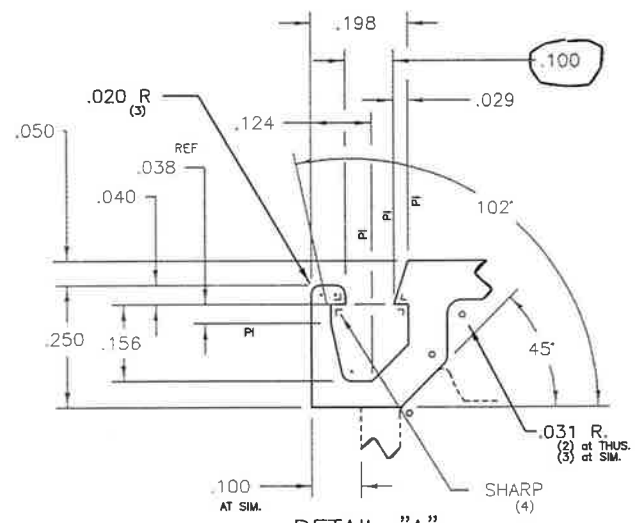


DETAIL "B"

2 X SIZE (2) THUS (2) SIM. DASHED

Report# B6094  
Date 9/10/02 Tech AB

Architectural Testing  
Test sample complies with these details.  
Deviations are noted.

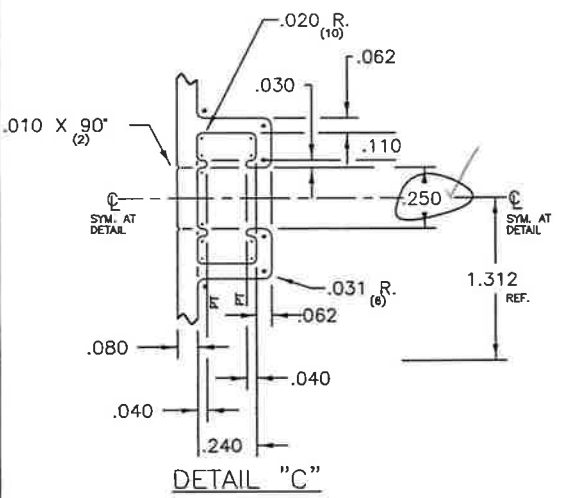


DETAIL "A"

4 X SIZE (2) THUS (2) SIM. DASHED

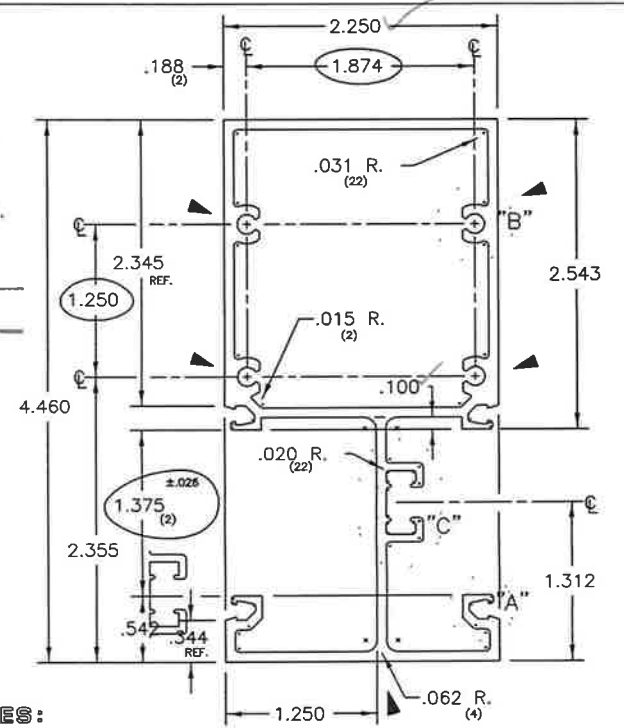
SECTION PROPERTIES

Ixx = 3.187	n <sup>4</sup>
Sxx = 1.421	n <sup>3</sup>
Iyy = 0.954	n <sup>4</sup>
Syy = 0.822	n <sup>3</sup>



DETAIL "C"

2 X SIZE



NOTES:

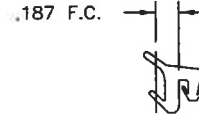
- 6063-T5 ALLOY AND TEMPER
- PAINT PERIMETER = 10.128
- XXX INDICATES I.D. MARK FOR IEC-TX
- ▶ INDICATES POSSIBLE STREAKING
- OUTSIDE PERIMETER = 24.040
- F&D POCKET AREA = .130"
- F&D PART NUMBER: RT450
- DEBRIDGE WITH A .218 X .015 MAX PENETRATION INTO THERMAL AREA

RW451

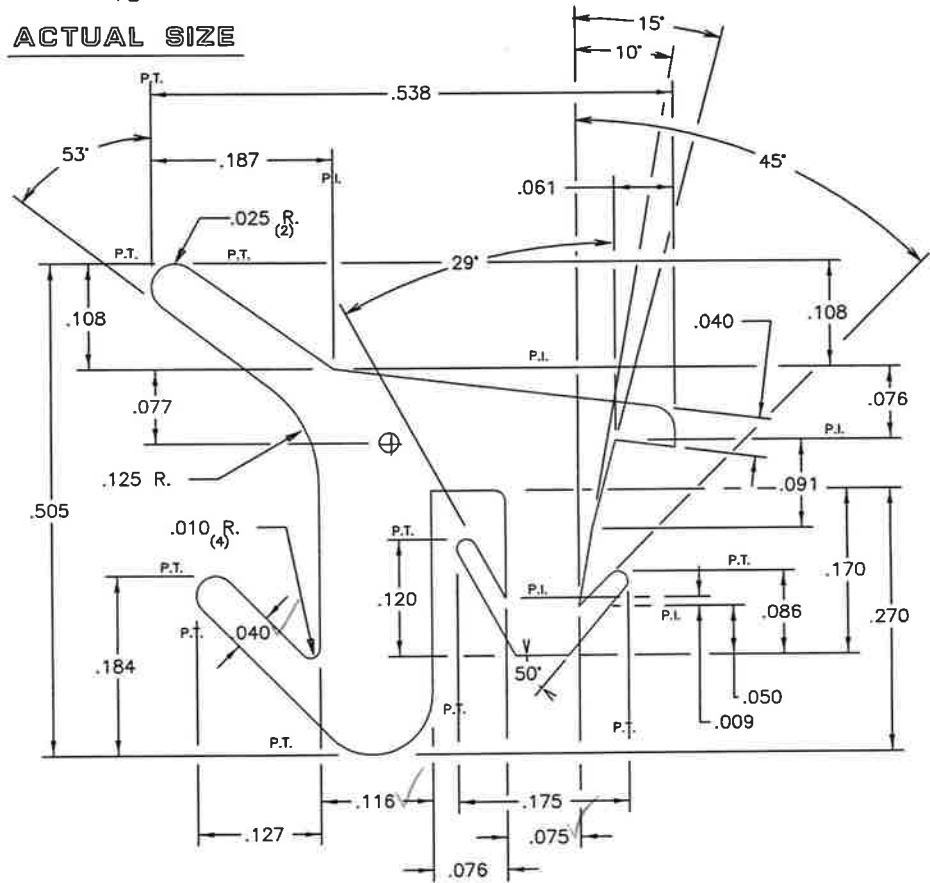
	1.435	100435	.080
	1.722	4.995	
	36.267	HOLLOW	
	11		H-60603

**NOTE :**

1. MATERIAL: EPDM, BLACK
2. HARDNESS: 70 ±5SHORE, "A" SCALE
3. AREA: .101
4. .026 DIA FIBREGLAS CORD(6 STRANDS)
5. UNIVERSAL RUBBER DIE 3765 OR EQUAL
6. SILICONE BATH REQUIRED.



**ACTUAL SIZE**



Architectural Testing

Test sample complies with these details.  
Deviations are noted.

Report#: B6094  
Date: 9/10/90 Tech: HB

				<b>U.S. ALUMINUM CORP.</b>	
				MAMO	TOP LOAD GASKET
				8/16/90	1/4" OR 1" GLASS
B	NOTE ADDED	6/12/96	MM	8X SIZE	PART NO: NP225
					<b>USA-822B</b>

UNITED STATES ALUMINUM CORP.

T-60606

1" GLASS STOP

GLH

7-21-00

RW453

2 X SIZE

NOTES:

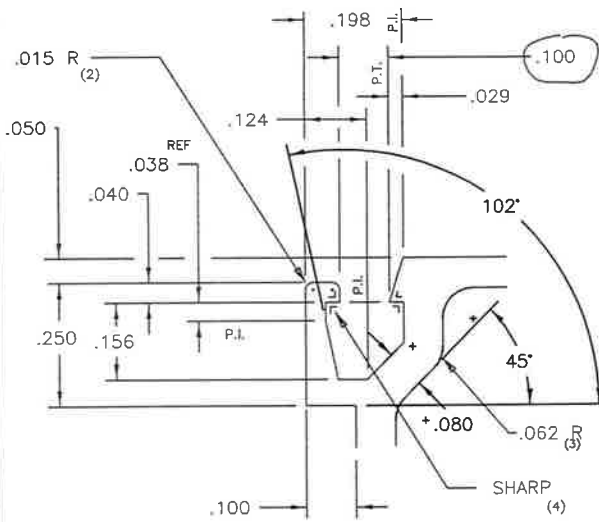
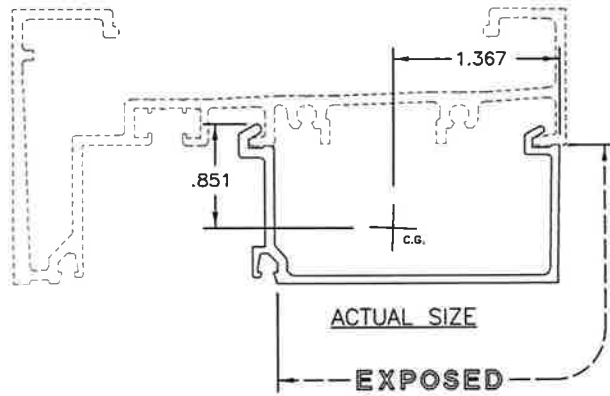
- 1. 6063-T5 ALLOY AND TEMPER
- 2. PAINT PERIMETER = 3.623"
- 3. XXX INDICATES I.D. MARK FOR IEC-TX
- 4. MATES WITH RW452; DIE#60605

RW433; DIE#60606

RW463; DIE#60608

SECTION PROPERTIES

I<sub>xx</sub> = 0.383 in<sup>4</sup>  
 S<sub>xx</sub> = 0.280 in<sup>3</sup>  
 I<sub>yy</sub> = 0.745 in<sup>4</sup>  
 S<sub>yy</sub> = 0.875 in<sup>3</sup>



GASKET POCKET DETAIL 'A'

SCALE: 4X SIZE

Architectural Testing

Test sample complies with these details.  
 Deviations are noted.

Report#

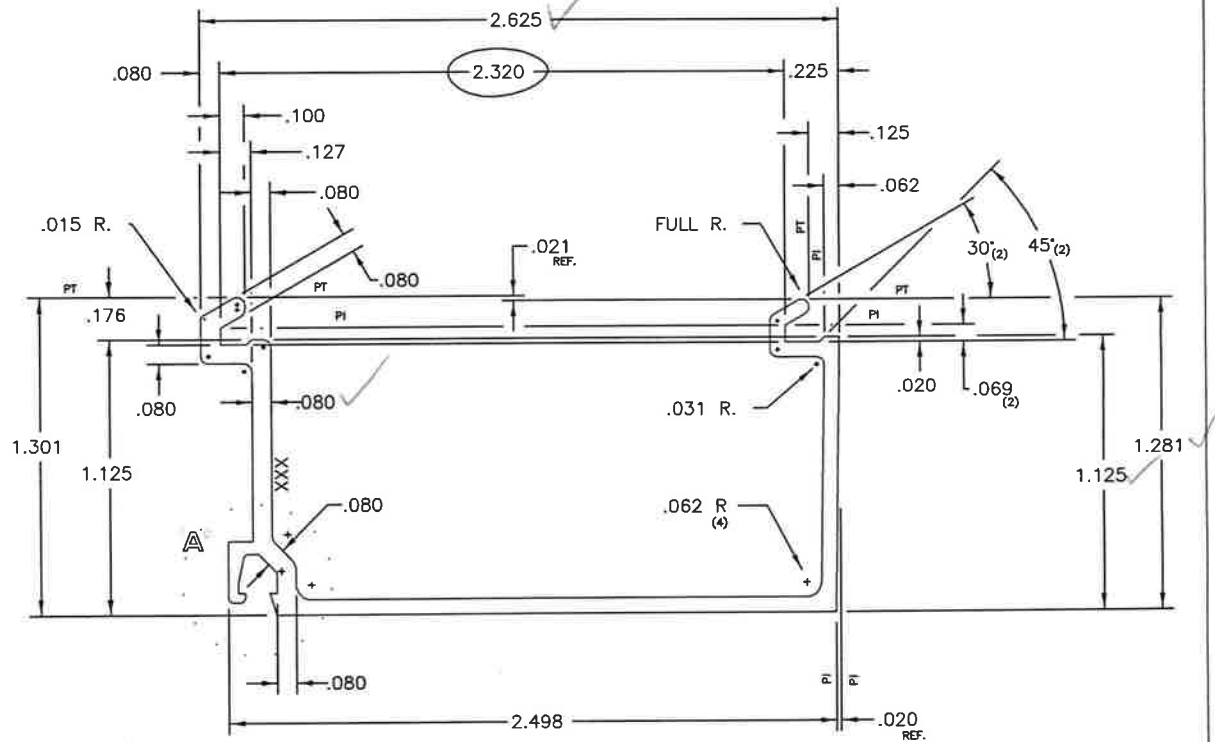
36094

Date

9/10/00

Tech

EB



RW450/451

.380	US-100374
.456	2.875
11.338	SOLID
25	T-60606

**NOTES:**

1. 6063-T5 ALLOY AND TEMPER.
2. DEBRIDGE WITH A .218 x .015 MAX PENETRATION INTO THERMAL AREA.
3. ASSEMBLES WITH RW252; DIE# 60599 RW465; DIE#60610
4. THERMAL DETAIL AREA: .138; "AA"
5. PAINT PERIMETER: 7.229
6. XXX INDICATES ID MARK FOR IEC-TX.
7. ◀ = STREAKS POSSIBLE
8. F&D PART NO. IS RT464

UNITED STATES ALUMINUM CORP.

T-60609

SILL

DWJ

7-24-00

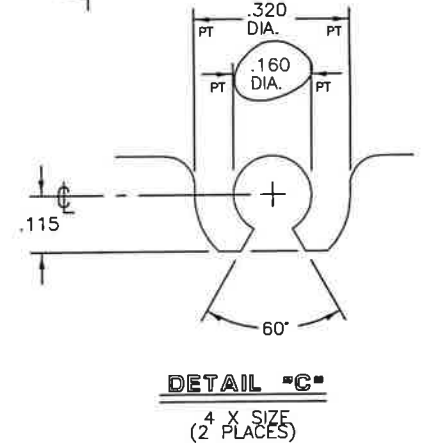
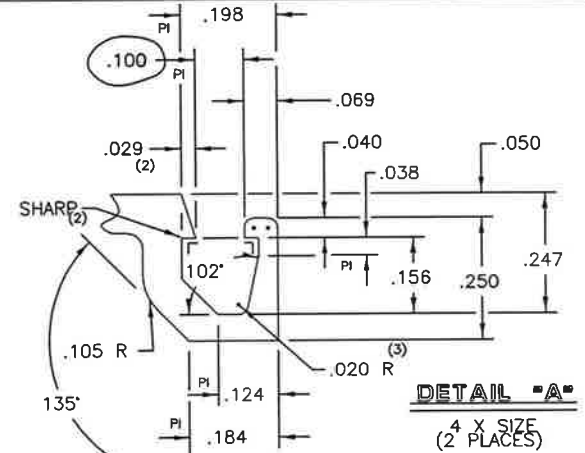
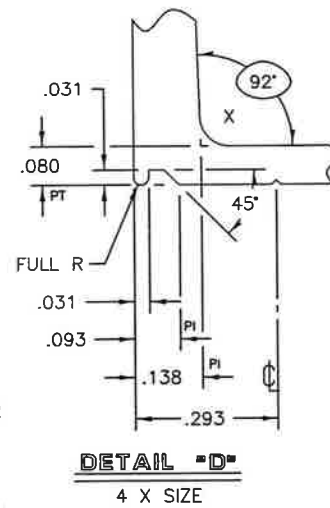
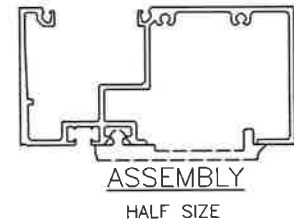
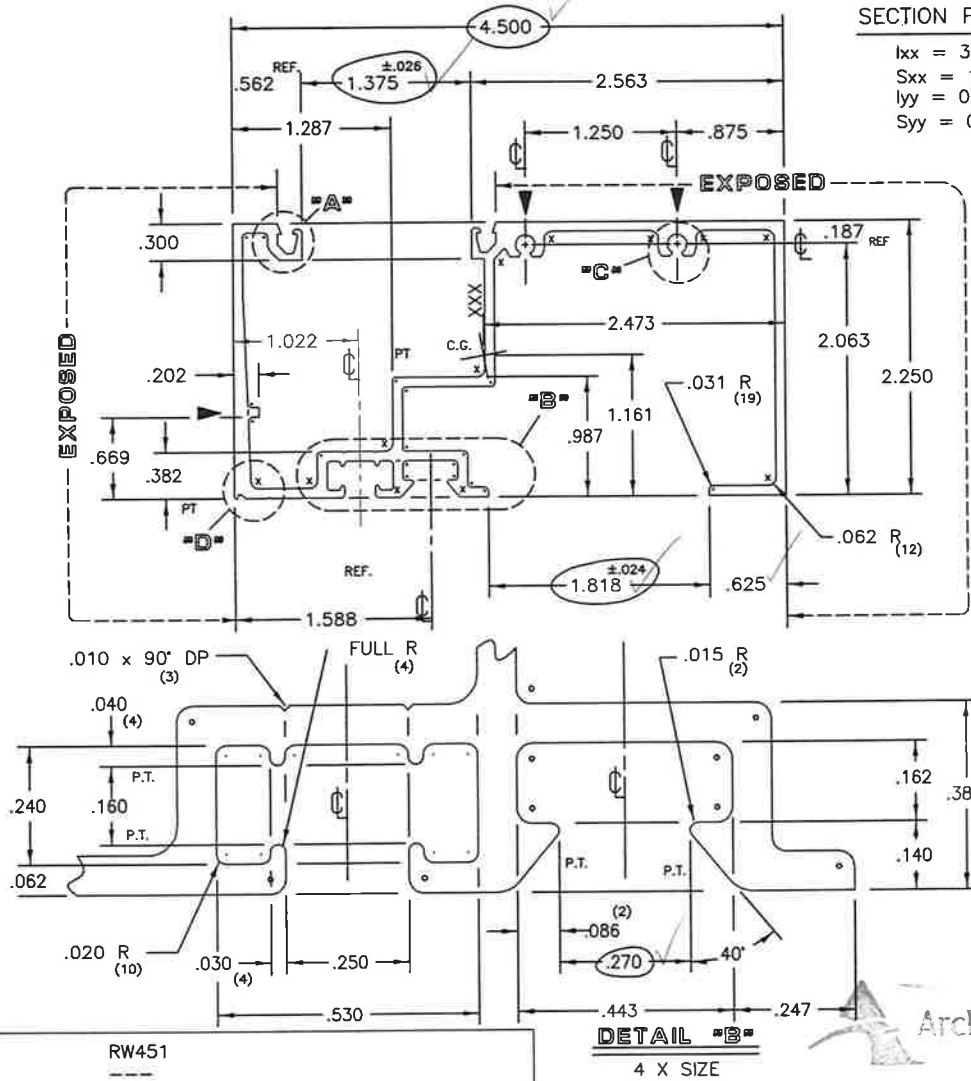
RW464

FULL SIZE

ECN

**SECTION PROPERTIES:**

$I_{xx} = 3.148 \text{ in}^4$   
 $S_{xx} = 1.273 \text{ in}^3$   
 $I_{yy} = 0.877 \text{ in}^4$   
 $S_{yy} = 0.755 \text{ in}^3$

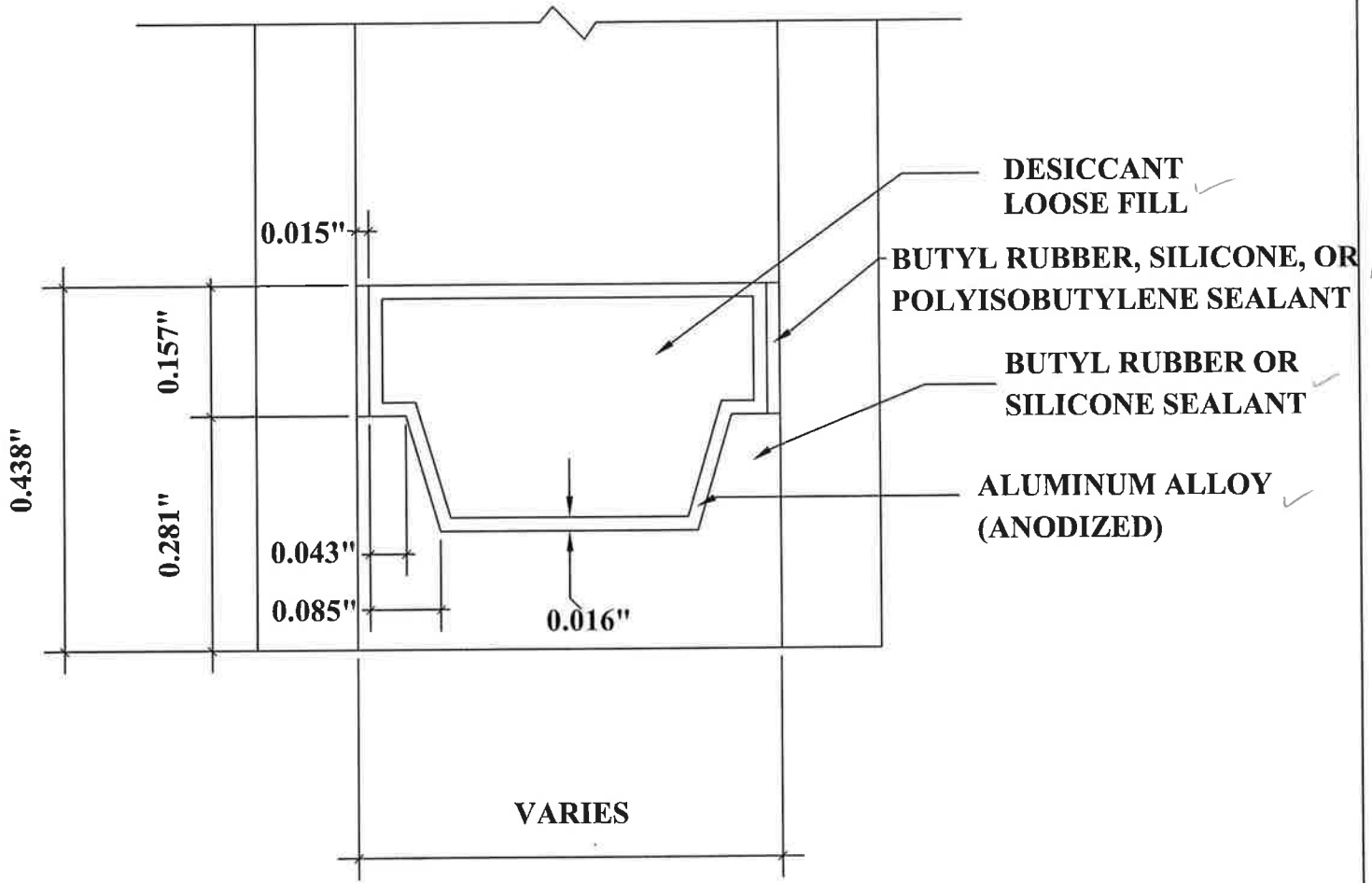


Architectural Testing

Test sample complies with these details.  
Deviations are noted.

Report# B6094  
Date 9/10/12 Tech STB

1.279	US-100372	
1.534	5.030	
29.971	SOLID	
20		T-60609



DETAIL FOR THERMAL MODELING OF ALUMINUM SPACER (A1-D)



Test sample complies with these details.  
Deviations are noted.

Report# B6094  
Date 9/10/12 Tech AB