



**AAMA 507-07 THERMAL PERFORMANCE REPORT**

**Rendered to:**

**UNITED STATES ALUMINUM**

**SERIES/MODEL: 451 Top Notch Ribbon Wall**

**TYPE: Glazed Wall System**

**Report No: B6092.01-116-45**  
**Report Date: 02/14/12**

## AAMA 507-07 THERMAL PERFORMANCE REPORT

Rendered to:

UNITED STATES ALUMINUM  
200 Singleton Road  
Waxahachie, Texas 75165

Report No: B6092.01-116-45  
Report Date: 02/14/12  
Simulation Date: 02/07/12

### Project Summary:

Architectural Testing, Inc. was contracted by United States Aluminum to provide U-Factor and Solar Heat Gain Coefficient thermal performance ratings on the 451 Top Notch Ribbon Wall Glazed Wall System. The thermal performance ratings were determined in accordance with AAMA 507-07, Standard Practice for Determining the Thermal Performance Characteristics of Fenestration Systems Installed in Commercial Building.

### Reference Documents:

*AAMA 507-07, Standard Practice for Determining the Thermal Performance Characteristics of Fenestration Systems Installed in Commercial Buildings*

*NFRC 100-2010, Procedure for Determining Fenestration Product U-Factors*

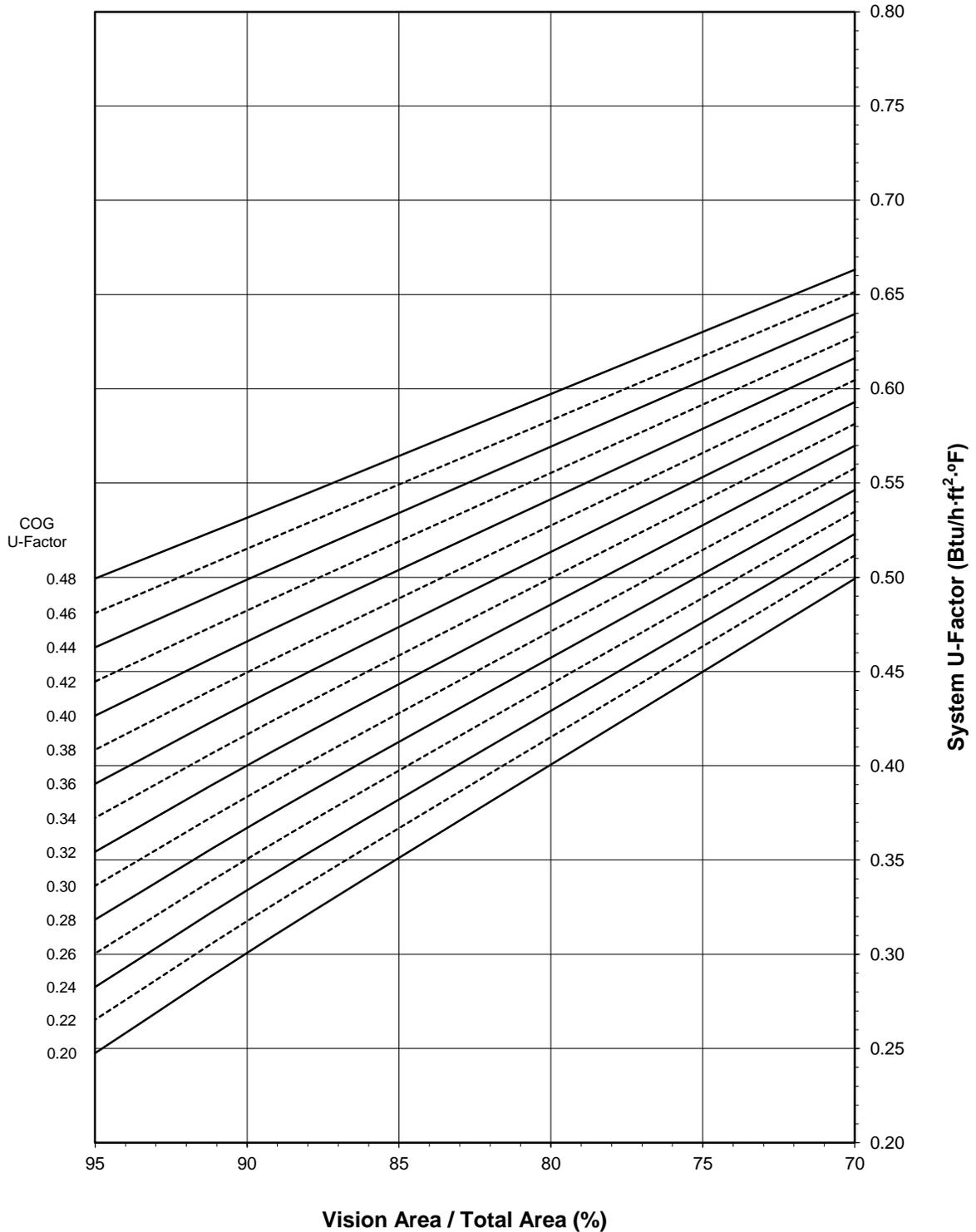
*NFRC 200-2010, Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence*

### Simulation Specimen Description:

**Series/Model:** 451 Top Notch Ribbon Wall  
**Product Groupings:** Material finish grouped per NFRC 100, Section 4.2.1 L  
**Type:** Glazed Wall System  
**Frame Material:** Aluminum Thermally Broken Framing System  
**Material Finish:** Painted Aluminum  
**Specimen Size:** 2000mm wide by 2000mm high (78-3/4" by 78-3/4")  
**Configuration:** Two vision lites separated by one intermediate vertical  
**Drawing Reference:** US Aluminum Drawings: TT451 Horiz, & TT451 Vert

**United States Aluminum**  
**451 Top Notch Ribbon Wall - Glazed Wall System**

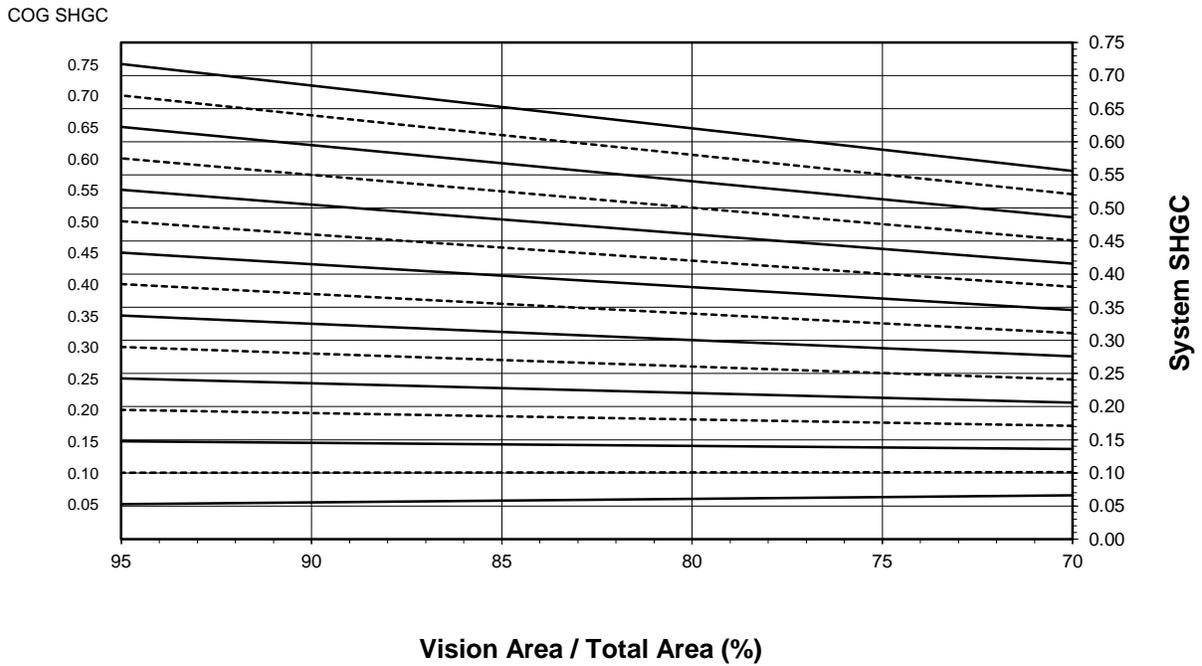
**System U-Factor vs. Percentage of Vision Area**



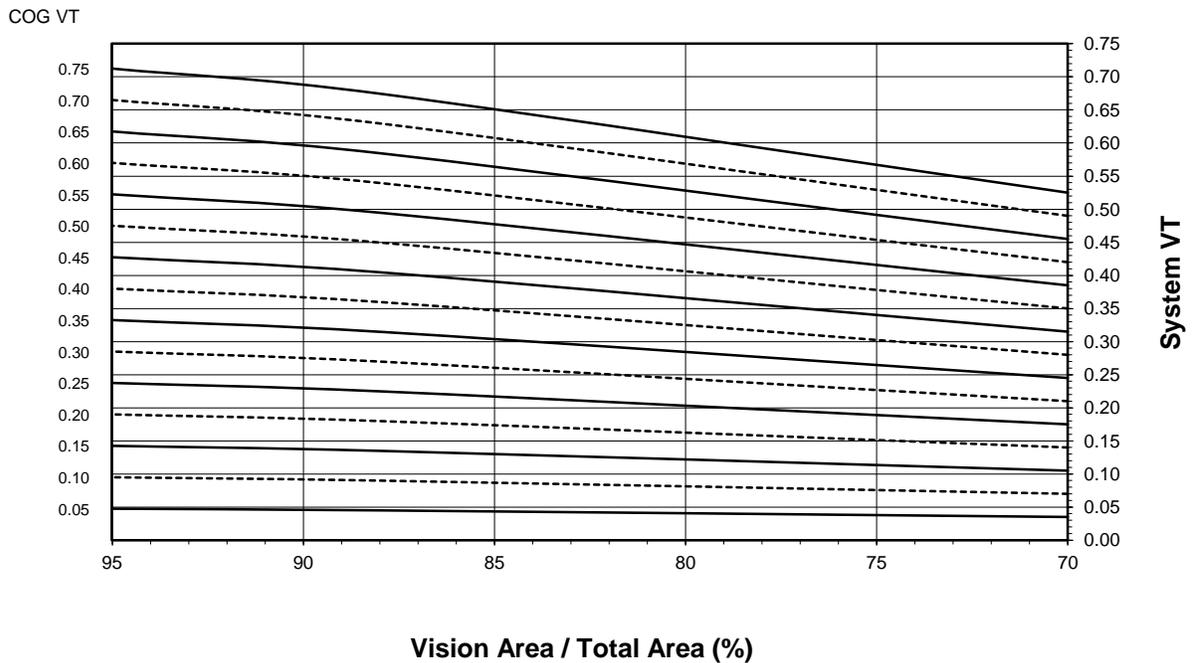
Note: 1 inch Overall - Dual Glazed Glass (0.48-0.20 COG) with Aluminum Spacer

United States Aluminum  
 451 Top Notch Ribbon Wall - Glazed Wall System

System SHGC vs. Percentage of Vision Area



System VT vs. Percentage of Vision Area



**United States Aluminum  
451 Top Notch Ribbon Wall - Glazed Wall System**

**Size Specific U-Factor Matrix\***

Glazing Option	Center of Glass U-Factor	Overall U-Factor
1	0.48	0.55
2	0.46	0.53
3	0.44	0.51
4	0.42	0.50
5	0.40	0.48
6	0.38	0.47
7	0.36	0.45
8	0.34	0.43
9	0.32	0.42
10	0.30	0.40
11	0.28	0.39
12	0.26	0.37
13	0.24	0.35
14	0.22	0.34
15	0.20	0.32

Note: 1 inch Overall - Dual Glazed Glass (0.48-0.20 COG) with Aluminum Spacer

**Size Specific SHGC Matrix\***

Center of Glass SHGC	Overall SHGC
0.75	0.67
0.70	0.63
0.65	0.58
0.60	0.54
0.55	0.50
0.50	0.45
0.45	0.41
0.40	0.36
0.35	0.32
0.30	0.28
0.25	0.23
0.20	0.19
0.15	0.14
0.10	0.10
0.05	0.06

**Size Specific VT Matrix\***

Center of Glass VT	Overall VT
0.75	0.67
0.70	0.63
0.65	0.58
0.60	0.54
0.55	0.49
0.50	0.45
0.45	0.40
0.40	0.36
0.35	0.31
0.30	0.27
0.25	0.22
0.20	0.18
0.15	0.13
0.10	0.09
0.05	0.04

\*Size Specific U-Factor, SHGC, and VT Matrices are based on the standard Glazed Wall System specimen size of 2000mm wide by 2000mm high (78-3/4" by 78-3/4"). This represents 87.9% Vision Area / Total Area.

Vision Area Data

Option No.	COG U-Factor	COG Temperature	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	Total Product U-Factor		
							70% Vision Area	NFRC 100-2010	95% Vision Area
							30.23" by 30.23"	78.74" by 78.74"	194.82" by 194.82"
1	0.48	43.7	Head	2.4050	1.0209	0.4934	0.6632	0.5456	0.4994
			L. Jamb	1.2691	1.1572	0.4934			
			R. Jamb	1.2691	1.1553	0.4922			
			Mullion	2.5381	1.1563	0.4934			
			Sill	2.3946	0.9531	0.4876			
2	0.46	44.8	Head	2.4050	1.0206	0.4808	0.6515	0.5298	0.4811
			L. Jamb	1.2691	1.1557	0.4806			
			R. Jamb	1.2691	1.1539	0.4794			
			Mullion	2.5381	1.1548	0.4806			
			Sill	2.3946	0.9526	0.4750			
3	0.44	45.8	Head	2.4050	1.0204	0.4682	0.6397	0.5140	0.4629
			L. Jamb	1.2691	1.1544	0.4678			
			R. Jamb	1.2691	1.1525	0.4666			
			Mullion	2.5381	1.1535	0.4678			
			Sill	2.3946	0.9522	0.4623			
4	0.42	46.8	Head	2.4050	1.0201	0.4557	0.6280	0.4982	0.4447
			L. Jamb	1.2691	1.1530	0.4551			
			R. Jamb	1.2691	1.1512	0.4539			
			Mullion	2.5381	1.1521	0.4551			
			Sill	2.3946	0.9517	0.4499			
5	0.40	47.9	Head	2.4050	1.0199	0.4433	0.6163	0.4824	0.4266
			L. Jamb	1.2691	1.1518	0.4423			
			R. Jamb	1.2691	1.1499	0.4411			
			Mullion	2.5381	1.1509	0.4423			
			Sill	2.3946	0.9513	0.4373			
6	0.38	48.9	Head	2.4050	1.0198	0.4309	0.6046	0.4666	0.4085
			L. Jamb	1.2691	1.1506	0.4297			
			R. Jamb	1.2691	1.1487	0.4285			
			Mullion	2.5381	1.1497	0.4297			
			Sill	2.3946	0.9510	0.4249			
7	0.36	50.0	Head	2.4050	1.0196	0.4184	0.5930	0.4507	0.3905
			L. Jamb	1.2691	1.1495	0.4170			
			R. Jamb	1.2691	1.1476	0.4157			
			Mullion	2.5381	1.1485	0.4170			
			Sill	2.3946	0.9506	0.4123			
8	0.34	51.0	Head	2.4050	1.0195	0.4061	0.5814	0.4349	0.3725
			L. Jamb	1.2691	1.1483	0.4045			
			R. Jamb	1.2691	1.1465	0.4032			
			Mullion	2.5381	1.1474	0.4045			
			Sill	2.3946	0.9503	0.4000			
9	0.32	52.0	Head	2.4050	1.0194	0.3937	0.5698	0.4190	0.3545
			L. Jamb	1.2691	1.1472	0.3919			
			R. Jamb	1.2691	1.1454	0.3906			
			Mullion	2.5381	1.1463	0.3919			
			Sill	2.3946	0.9500	0.3875			

Vision Area Data

Option No.	COG U-Factor	COG Temperature	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	Total Product U-Factor		
							70% Vision Area	NFRC 100-2010	95% Vision Area
							30.23" by 30.23"	78.74" by 78.74"	194.82" by 194.82"
10	0.30	53.1	Head	2.4050	1.0138	0.3813	0.5579	0.4029	0.3364
			L. Jamb	1.2691	1.1462	0.3795			
			R. Jamb	1.2691	1.1443	0.3781			
			Mullion	2.5381	1.1453	0.3795			
			Sill	2.3946	0.9498	0.3752			
11	0.28	54.2	Head	2.4050	1.0137	0.3689	0.5464	0.3870	0.3185
			L. Jamb	1.2691	1.1453	0.3669			
			R. Jamb	1.2691	1.1434	0.3655			
			Mullion	2.5381	1.1443	0.3669			
			Sill	2.3946	0.9496	0.3628			
12	0.26	55.2	Head	2.4050	1.0139	0.3566	0.5349	0.3710	0.3005
			L. Jamb	1.2691	1.1443	0.3544			
			R. Jamb	1.2691	1.1424	0.3531			
			Mullion	2.5381	1.1433	0.3544			
			Sill	2.3946	0.9494	0.3505			
13	0.24	56.3	Head	2.4050	1.0136	0.3445	0.5231	0.3550	0.2827
			L. Jamb	1.2691	1.1434	0.3420			
			R. Jamb	1.2691	1.1414	0.3406			
			Mullion	2.5381	1.1424	0.3420			
			Sill	2.3946	0.9453	0.3379			
14	0.22	57.3	Head	2.4050	1.0135	0.3324	0.5116	0.3391	0.2654
			L. Jamb	1.2691	1.1425	0.3297			
			R. Jamb	1.2691	1.1405	0.3284			
			Mullion	2.5381	1.1415	0.3297			
			Sill	2.3946	0.9451	0.3258			
15	0.20	58.4	Head	2.4050	1.0135	0.3203	0.4993	0.3227	0.2476
			L. Jamb	1.2691	1.1359	0.3170			
			R. Jamb	1.2691	1.1339	0.3157			
			Mullion	2.5381	1.1349	0.3170			
			Sill	2.3946	0.9449	0.3136			

Detailed drawings, datasheets, 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 simulated 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 named herein and relates only to the specimen(s) simulated. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.:

SIMULATED BY:

REVIEWED BY:

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Eric Barilar  
Simulation Technician

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Kevin S. Louder  
Project Engineer

EAB:EAB  
B6092.01-116-45

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

Appendix A: Drawings and Bills of Material (8)

### Revision Log

<b><u>Rev. #</u></b>	<b><u>Date</u></b>	<b><u>Page(s)</u></b>	<b><u>Revision(s)</u></b>
.01R0	2/14/2012	All	Original Report Issue

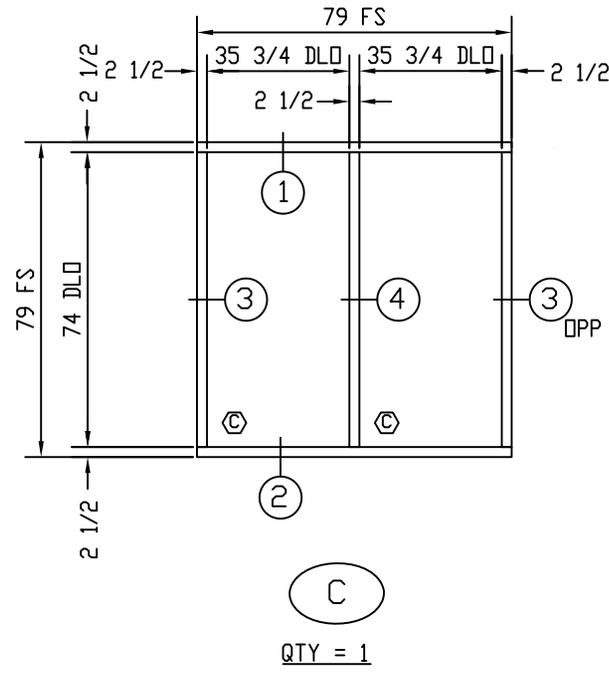
All drawings and Bills of Material used in simulating this product are enclosed in this Appendix.

**ATI**

Report # B6092-116-45

Date 2/3/2012

Simulator Eric Bakula



SYMBOL KEY			
SYMBOL	DESCRIPTION	QTY	COMMENTS
(C)	36.625 X 74.875	2	1 INS = INSULATED GLASS

REV	REV_DESCRIPTION	DATE	XXX



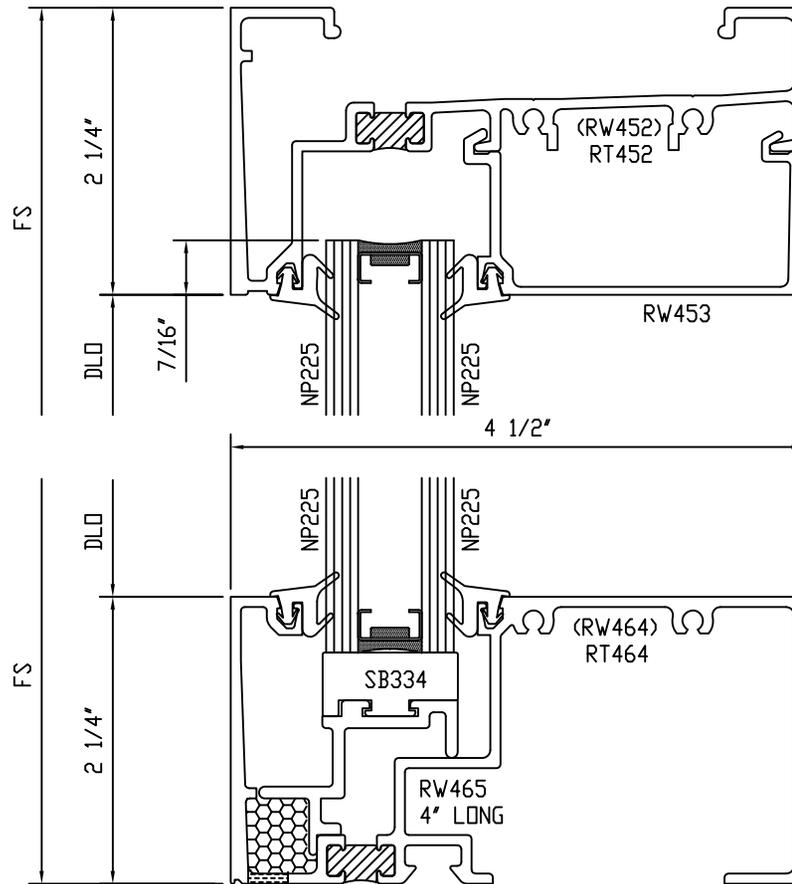
2100 E. 38TH STREET    VERNON, CA 90058  
 PHONE: (323) 588-1281    FAX: (323) 232-2523

DIVISION UNITED STATES ALUMINUM

DRAWN BY: <u>DCW</u>	THERMAL_TEST_NFRC_AAMA_1503	DWG NO.
DATE: <u>12/23/2011</u>	SERIES_TT451	MU2011-003-01
SCALE: <u>3/8"=1'</u>		

1

2



**ATI**

**Report #** B6092-116-45

**Date** 2/3/2012

**Simulator** Eric Boriska

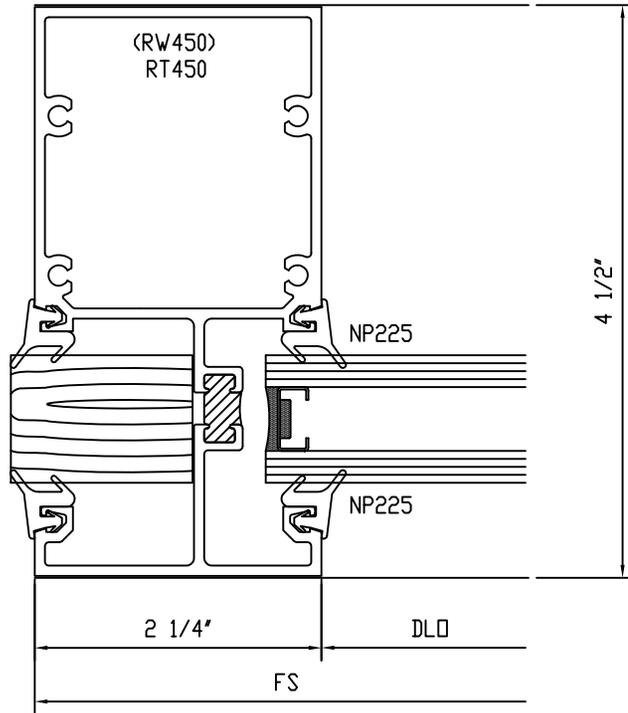
5/16" DIA WEEP  
W/UB625 BAFFLE



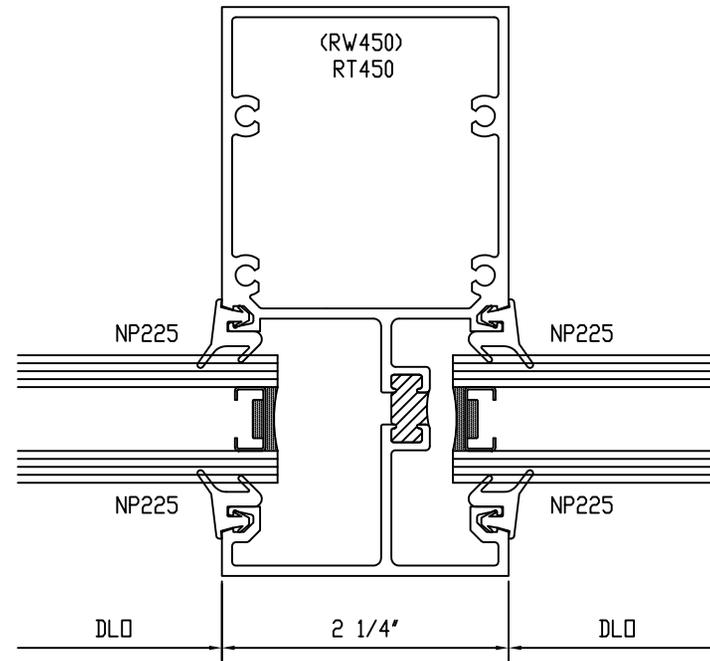
2100 E. 38TH STREET VERNON, CA 90058  
PHONE: (323) 588-1281 FAX: (323) 232-2523

DIVISION UNITED STATES ALUMINUM

REV	REV_DESCRIPTION	DATE	XXX	DATE	12/23/2011	THERMAL_TEST_NFRC_AAMA_1503	DWG NO. MU2011-003-02
SYM	REVISION	DATE	BY	SCALE	FULL		
DRAWN BY: DCW						SERIES_TT451	
DATE: 12/23/2011							



3



4

**ATI**  
**Report #** B6092-116-45  
**Date** 2/3/2012  
**Simulator** Eric Borillo

REV	REV_DESCRIPTION	DATE	XXX
SYM	REVISION	DATE	BY



2100 E. 38TH STREET VERNON, CA 90058  
 PHONE: (323) 588-1281 FAX: (323) 232-2523

DIVISION UNITED STATES ALUMINUM

DRAWN BY: DCW  
 DATE: 12/23/2011

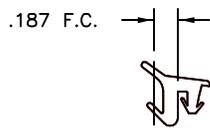
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SERIES\_TT451

DWG NO.  
MU2011-003-03

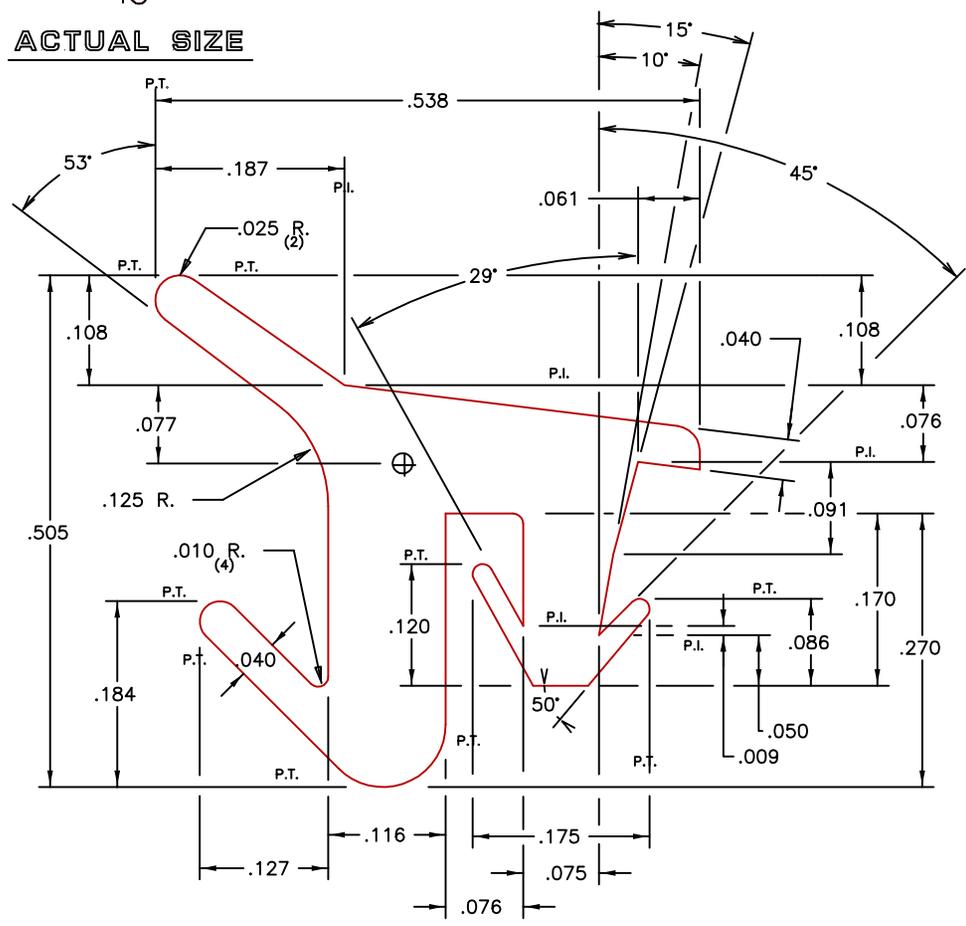
SCALE: FULL

**NOTE :**

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



**ACTUAL SIZE**



ATI

Report # B6092-116-45

Date 2/3/2012

Simulator Eric Barthe

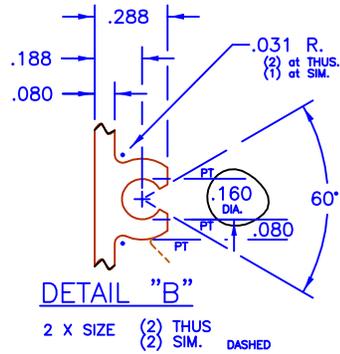
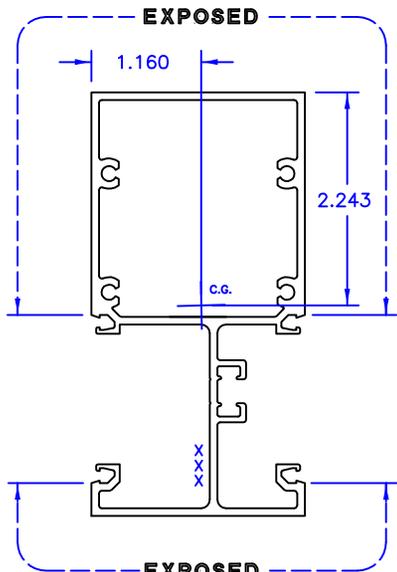
B	NOTE ADDED	6/12/96	MM

U.S. ALUMINUM CORP.

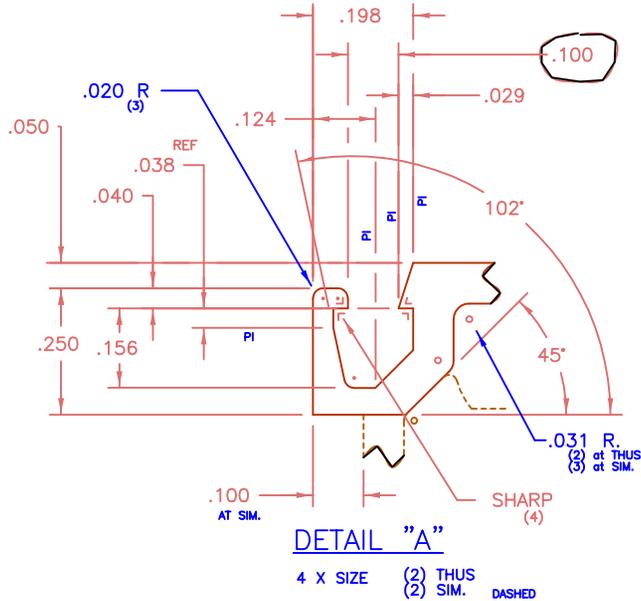
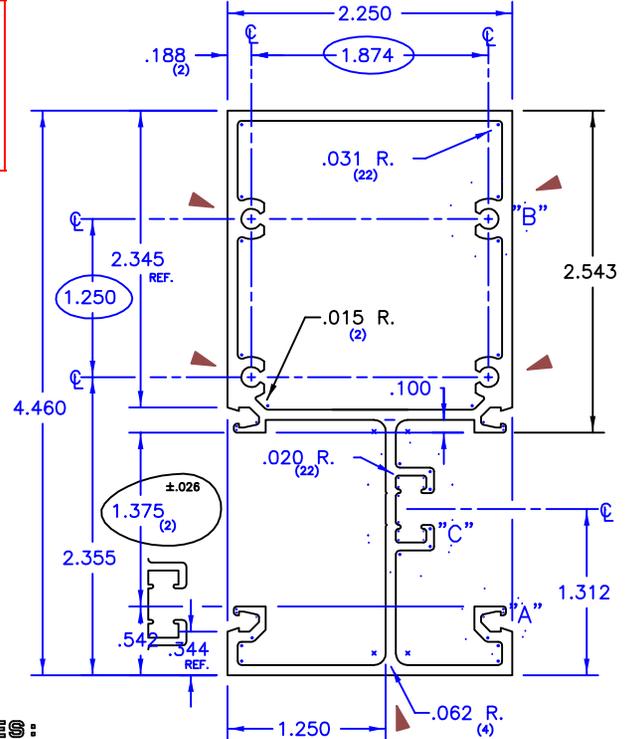
MAMO  
8/16/90  
8X SIZE

TOP LOAD GASKET  
1/4" OR 1" GLASS  
PART NO: NP225

USA-822B

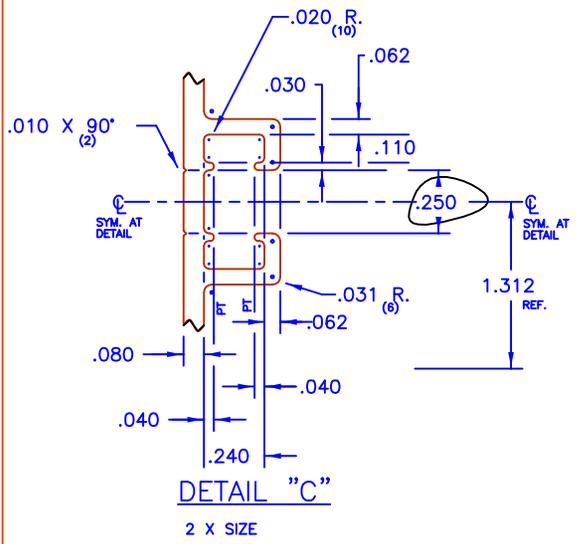


**ATI**  
 Report # B6092-116-45  
 Date 2/3/2012  
 Simulator Eric Barthe



**SECTION PROPERTIES**

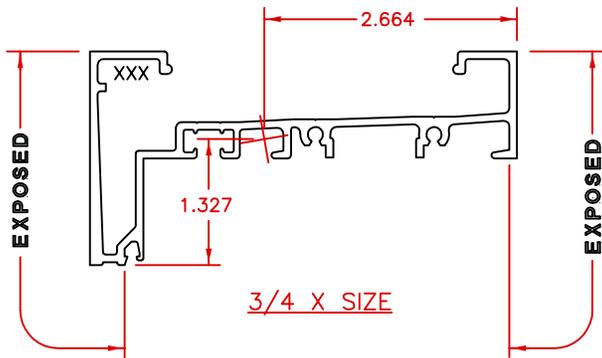
Ixx	=	3.187	N <sup>4</sup>
Sxx	=	1.421	N <sup>3</sup>
Iyy	=	0.954	N <sup>4</sup>
Syy	=	0.822	N <sup>3</sup>



- 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	
	1.722	4.995	
	36.267	HOLLOW	
	11		H-60603



**ATI**

Report # B6092-116-45

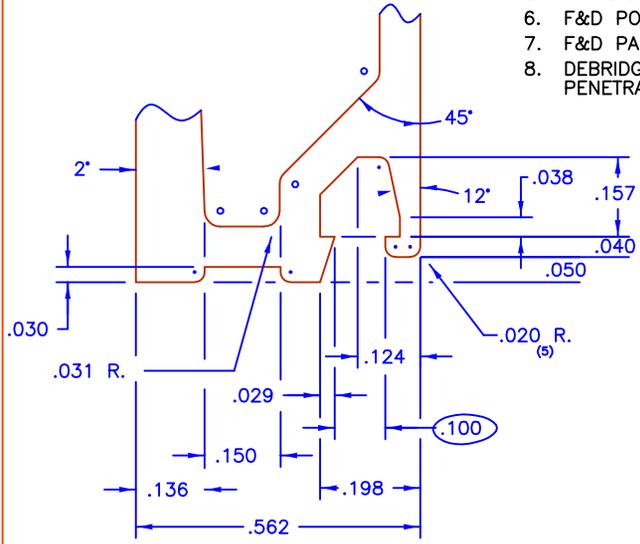
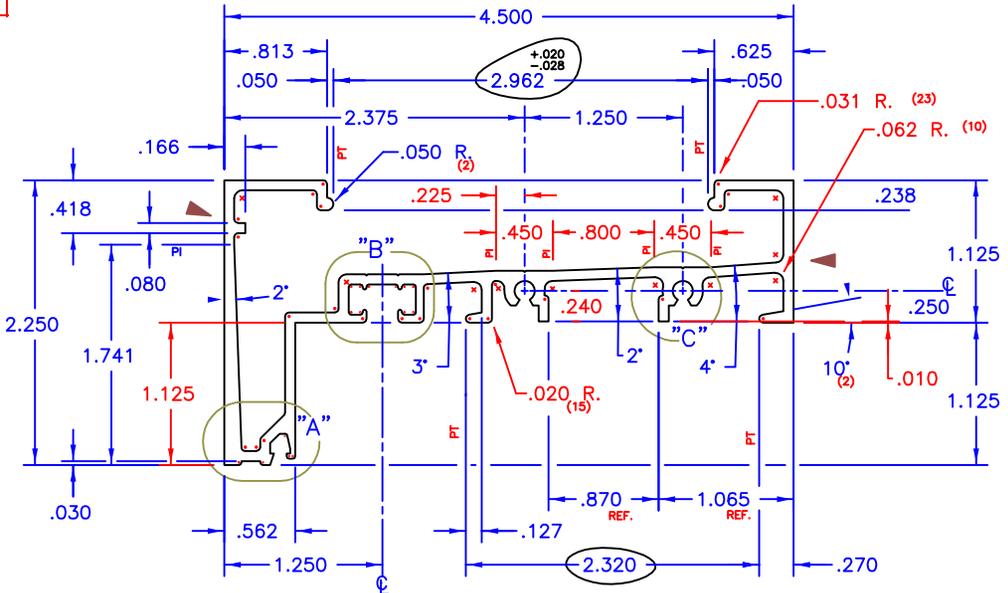
Date 2/3/2012

Simulator Eric Barthelemy

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

**NOTES:**

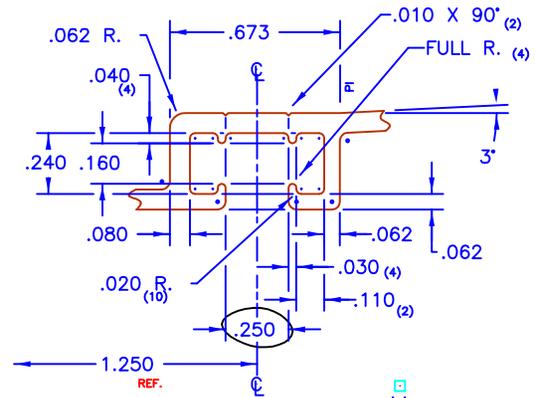
1. 6063-T5 ALLOY AND TEMPER
2. PAINT PERIMETER = 3.741"
3. XXX INDICATES I.D. MARK FOR IEC-TX
4. MATES WITH RW443 DIE#  
RW453; DIE#60606  
RW250; DIE#60598  
RW260; DIE#60600
5. ► INDICATES POSSIBLE STREAKING
6. F&D POCKET AREA = .130"
7. F&D PART NUMBER: RT452
8. DEBRIDGE WITH A .218 X .015 MAX PENETRATION INTO THERMAL AREA



**DETAIL "A"**

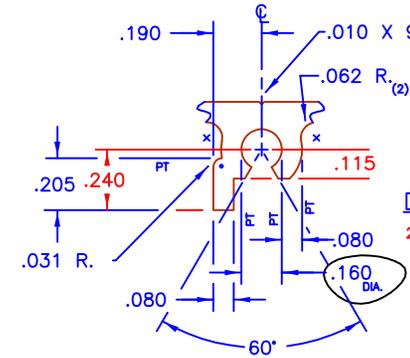
4 X SIZE

4 1/2" TOP NOTCH



**DETAIL "B"**

2 X SIZE



**DETAIL "C"**

2 X SIZE (2) PLACES

**SECTION PROPERTIES**

Ixx =	2.933	IN <sup>4</sup>
Sxx =	1.097	IN <sup>3</sup>
Iyy =	0.370	IN <sup>4</sup>
Syy =	0.279	IN <sup>3</sup>

	1.132	100437	
	1.358	5.031	
	26.404	SOLID	
	19		
			T-60605

UNITED STATES ALUMINUM CORP. T-60606

1" GLASS STOP GLH 7-21-00  
RW453 2 X SIZE

**NOTES:**

- 6063-T5 ALLOY AND TEMPER
- PAINT PERIMETER = 3.623"
- XXX INDICATES I.D. MARK FOR IEC-TX
- MATES WITH RW452; DIE#60605  
RW433; DIE#60606  
RW463; DIE#60608

**ATI**

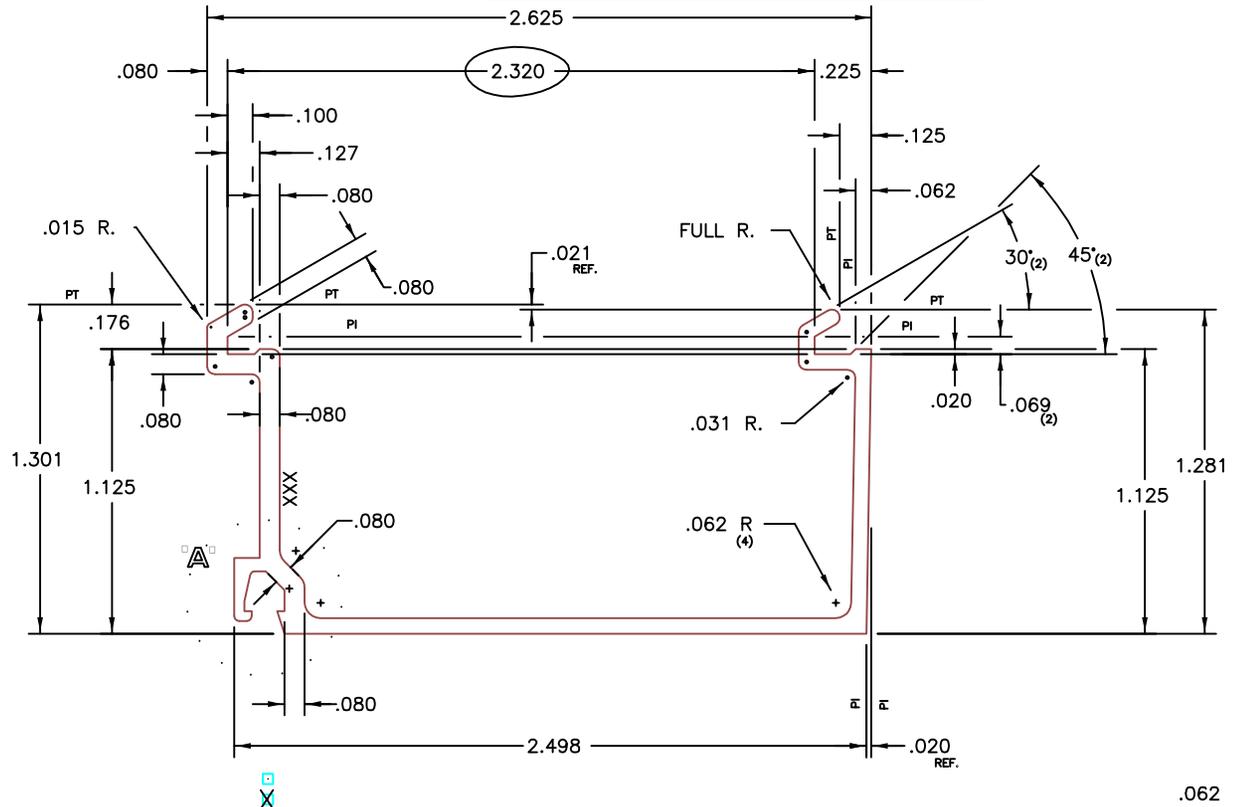
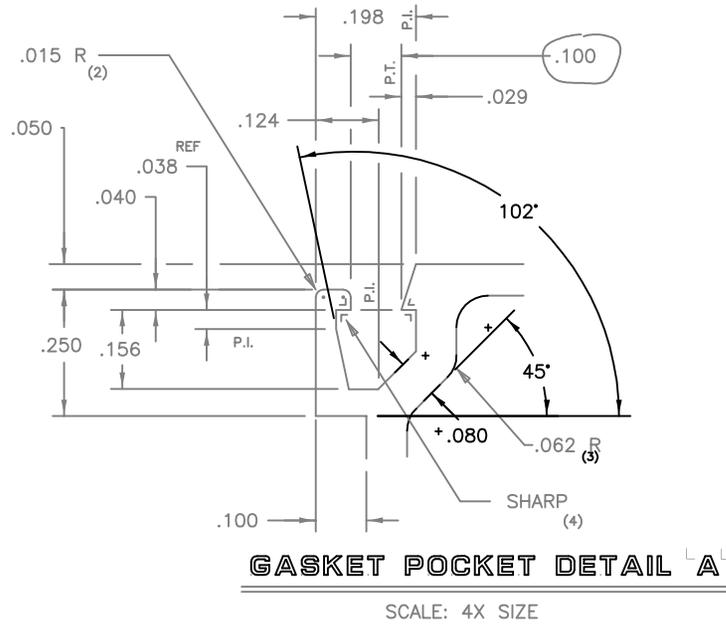
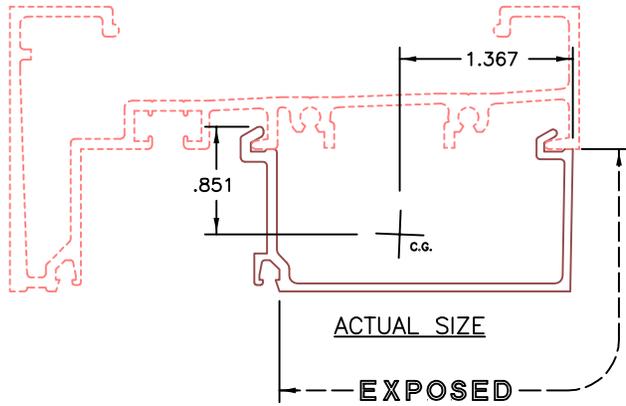
Report # B6092-116-45

Date 2/3/2012

Simulator Eric Barilla

SECTION PROPERTIES

Ixx = 0.383 N<sup>4</sup>  
Sxx = 0.280 N<sup>3</sup>  
Iyy = 0.745 N<sup>4</sup>  
Syy = 0.875 N<sup>3</sup>



RW450/451

---

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

**NOTES:**

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

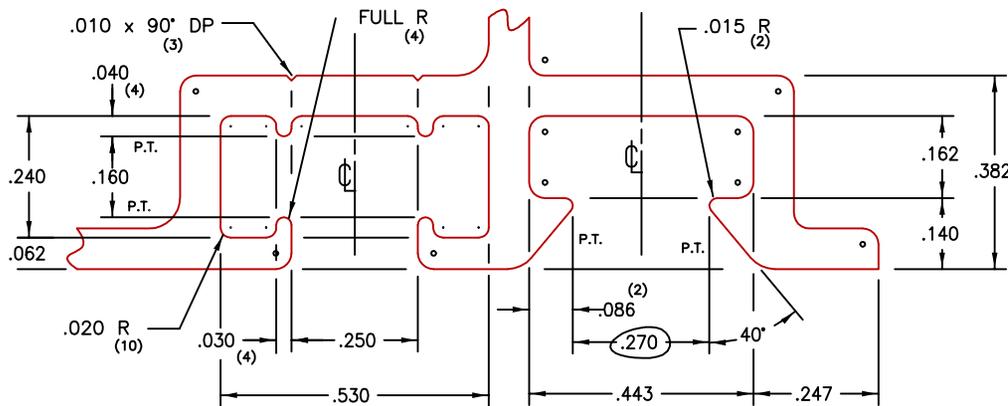
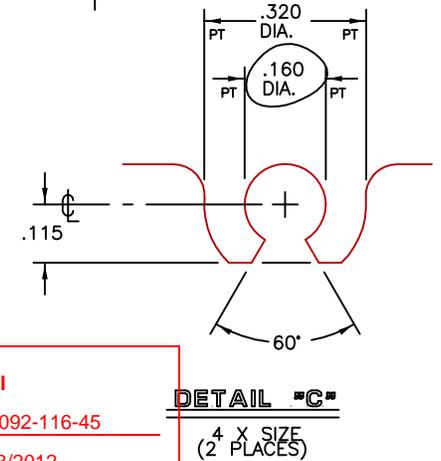
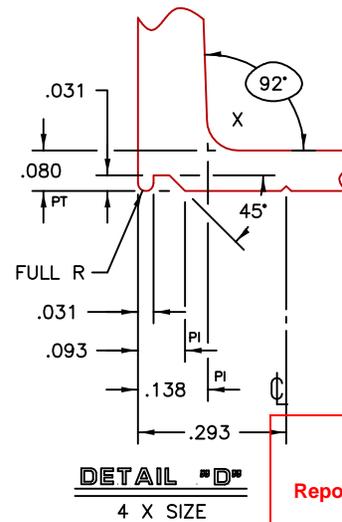
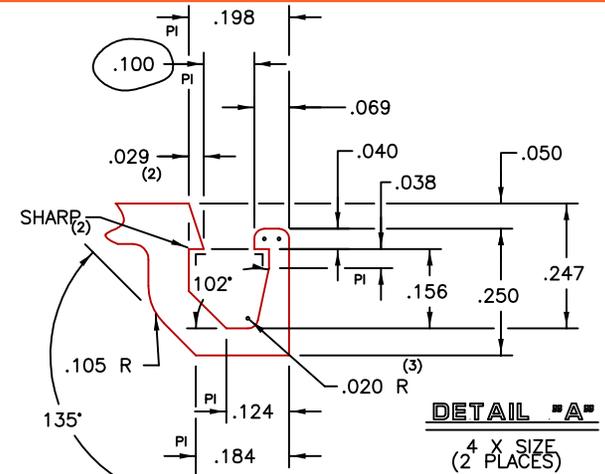
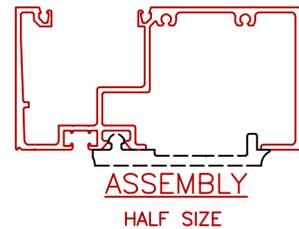
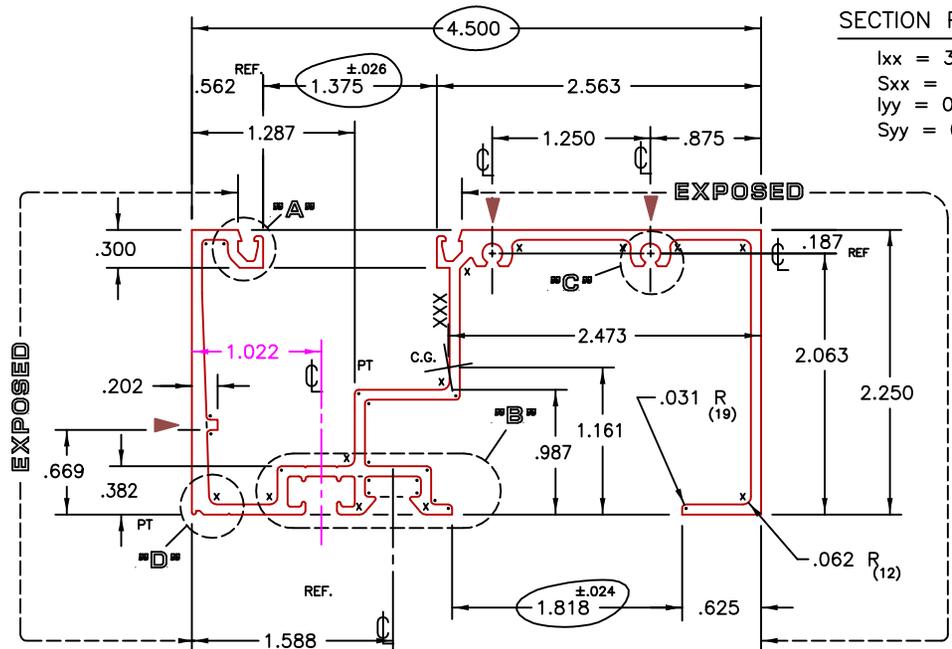
**UNITED STATES ALUMINUM CORP.** T-60609

SILL DWJ 7-24-00  
RW464 FULL SIZE

ECN

**SECTION PROPERTIES:**

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

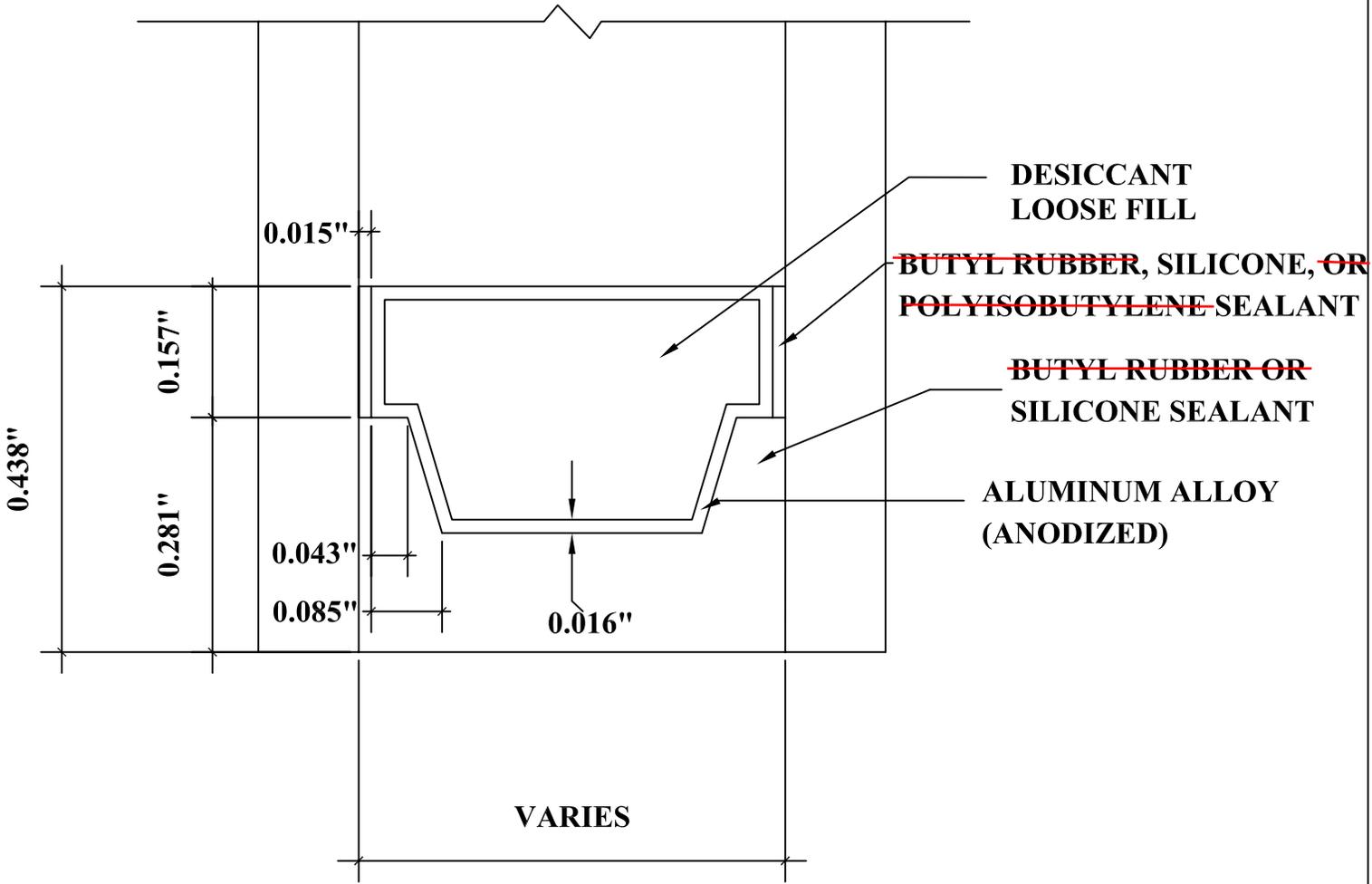


**ATI**  
 Report # B6092-116-45  
 Date 2/3/2012  
 Simulator Eric Barilko

RW451

**DETAIL "B"**  
4 X SIZE

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



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