Architectural Testing

AAMA 507-07 THERMAL PERFORMANCE REPORT

Rendered to:

UNITED STATES ALUMINUM

SERIES/MODEL: FT 451 Storefront (Exterior Set)
TYPE: Glazed Wall System

Report No: **B8198.01-116-45**
Report Date: **04/02/12**

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

Architectural Testing

AAMA 507-07 THERMAL PERFORMANCE REPORT

Rendered to:

UNITED STATES ALUMINUM
332 Firetower Road
200 Singleton Drive, Texas 75165

Report No:	B8198.01-116-45
Report Date:	04/02/12
Simulation Date:	04/02/12

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 FT 451 Storefront (Exterior Set) 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:	FT 451 Storefront (Exterior Set)
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 FT451 Drawings

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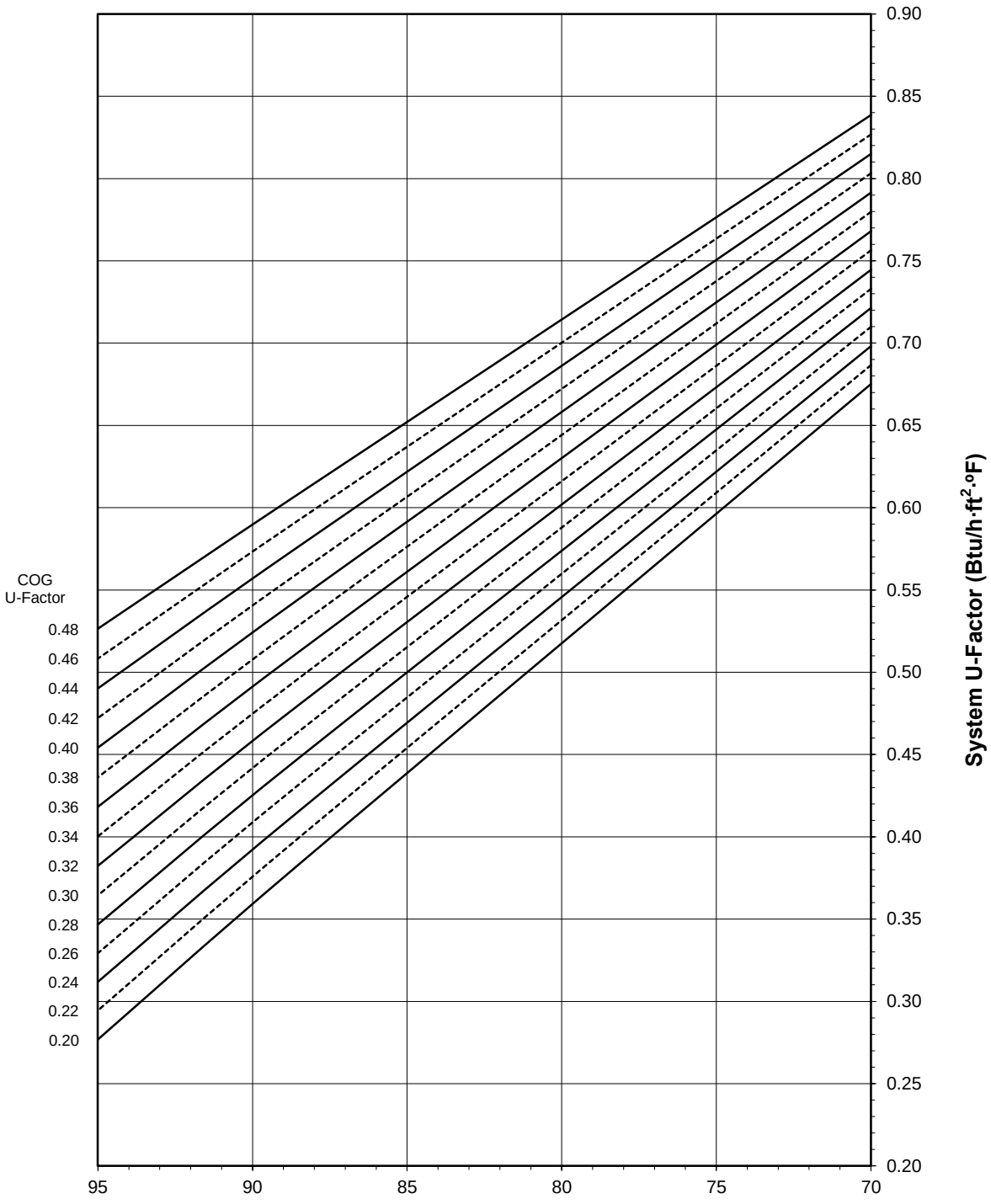
United States Aluminum
FT 451 Storefront (Exterior Set) - Glazed Wall System

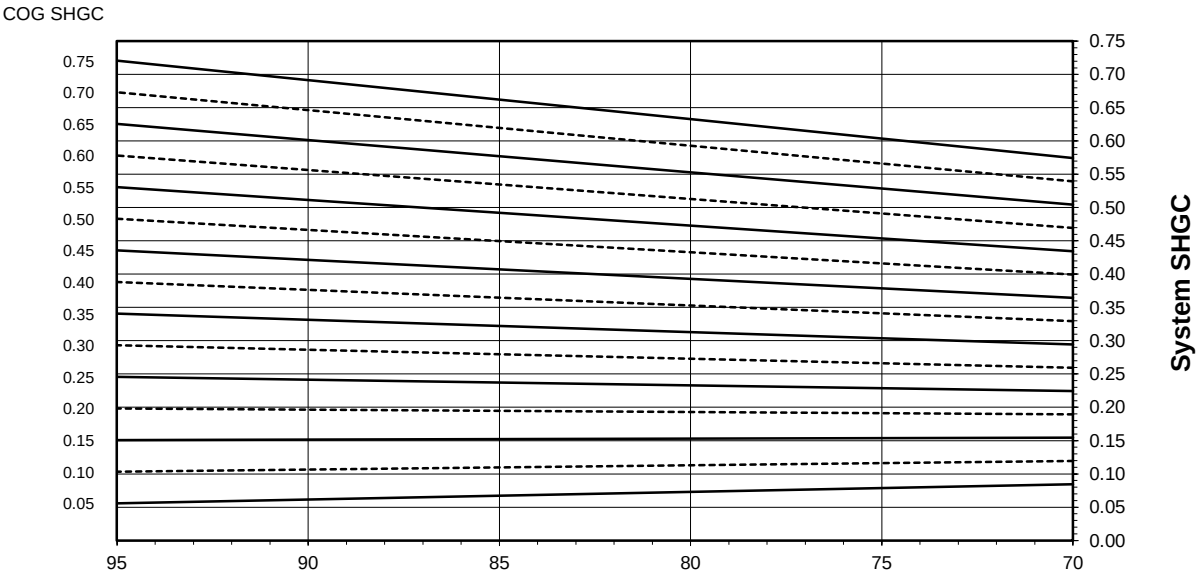
System U-Factor vs. Percentage of Vision Area



Note: 1 inch Overall - Dual Glazed Glass (0.48-0.20 COG) with Tin-Plate Intercept

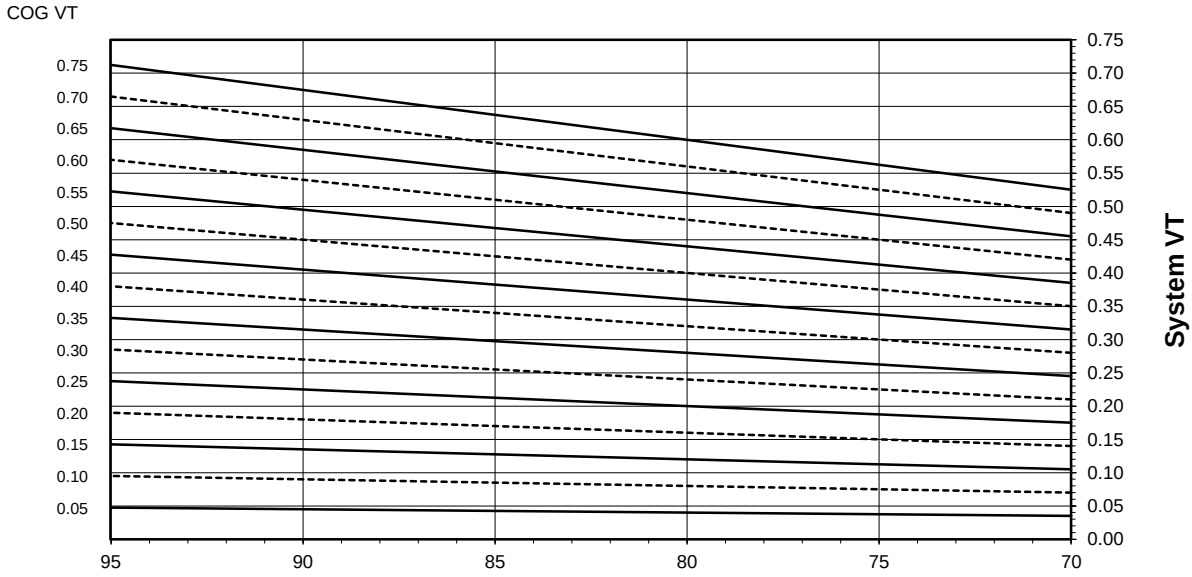
United States Aluminum
FT 451 Storefront (Exterior Set) - Glazed Wall System

System SHGC vs. Percentage of Vision Area



Vision Area / Total Area (%)

System VT vs. Percentage of Vision Area



Vision Area / Total Area (%)

United States Aluminum
FT 451 Storefront (Exterior Set) - Glazed Wall System

Size Specific U-Factor Matrix*

Glazing Option	Center of Glass U-Factor	Overall U-Factor
1	0.48	0.61
2	0.46	0.59
3	0.44	0.58
4	0.42	0.56
5	0.40	0.54
6	0.38	0.53
7	0.36	0.51
8	0.34	0.50
9	0.32	0.48
10	0.30	0.46
11	0.28	0.45
12	0.26	0.43
13	0.24	0.42
14	0.22	0.40
15	0.20	0.38

Note: 1 inch Overall - Dual Glazed Glass (0.48-0.20 COG) with Tin-Plate Intercept

Size Specific SHGC Matrix*

Center of Glass SHGC	Overall SHGC
0.75	0.68
0.70	0.64
0.65	0.59
0.60	0.55
0.55	0.51
0.50	0.46
0.45	0.42
0.40	0.37
0.35	0.33
0.30	0.28
0.25	0.24
0.20	0.20
0.15	0.15
0.10	0.11
0.05	0.06

Size Specific VT Matrix*

Center of Glass VT	Overall VT
0.75	0.66
0.70	0.62
0.65	0.58
0.60	0.53
0.55	0.49
0.50	0.44
0.45	0.40
0.40	0.35
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 88.5% 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*
							28.60" by 28.60"	*78.74" by 78.74"*	*184.20" by 184.20"*
1	0.48	43.7	Head	2.2748	1.4120	0.4740	0.8386	0.6086	0.5265
			L. Jamb	1.2748	1.8959	0.4727			
			R. Jamb	1.2748	1.8519	0.4676			
			Mullion	2.5496	1.8738	0.4701			
			Sill	1.9627	1.5203	0.4754			
2	0.46	44.8	Head	2.2748	1.4117	0.4605	0.8268	0.5926	0.5084
			L. Jamb	1.2748	1.8951	0.4592			
			R. Jamb	1.2748	1.8512	0.4540			
			Mullion	2.5496	1.8731	0.4566			
			Sill	1.9627	1.5201	0.4620			
3	0.44	45.8	Head	2.2748	1.4115	0.4471	0.8150	0.5767	0.4903
			L. Jamb	1.2748	1.8945	0.4457			
			R. Jamb	1.2748	1.8504	0.4405			
			Mullion	2.5496	1.8724	0.4431			
			Sill	1.9627	1.5199	0.4486			
4	0.42	46.8	Head	2.2748	1.4112	0.4337	0.8032	0.5607	0.4722
			L. Jamb	1.2748	1.8939	0.4323			
			R. Jamb	1.2748	1.8496	0.4270			
			Mullion	2.5496	1.8717	0.4296			
			Sill	1.9627	1.5198	0.4353			
5	0.40	47.9	Head	2.2748	1.4110	0.4203	0.7914	0.5447	0.4542
			L. Jamb	1.2748	1.8933	0.4188			
			R. Jamb	1.2748	1.8489	0.4135			
			Mullion	2.5496	1.8711	0.4161			
			Sill	1.9627	1.5197	0.4219			
6	0.38	48.9	Head	2.2748	1.4107	0.4070	0.7798	0.5286	0.4363
			L. Jamb	1.2748	1.8929	0.4055			
			R. Jamb	1.2748	1.8482	0.4001			
			Mullion	2.5496	1.8706	0.4028			
			Sill	1.9627	1.5196	0.4087			
7	0.36	50.0	Head	2.2748	1.4106	0.3936	0.7680	0.5126	0.4183
			L. Jamb	1.2748	1.8924	0.3920			
			R. Jamb	1.2748	1.8477	0.3866			
			Mullion	2.5496	1.8701	0.3893			
			Sill	1.9627	1.5196	0.3953			
8	0.34	51.0	Head	2.2748	1.4104	0.3804	0.7564	0.4965	0.4004
			L. Jamb	1.2748	1.8920	0.3788			
			R. Jamb	1.2748	1.8471	0.3733			
			Mullion	2.5496	1.8696	0.3761			
			Sill	1.9627	1.5195	0.3822			
9	0.32	52.0	Head	2.2748	1.4103	0.3670	0.7446	0.4803	0.3824
			L. Jamb	1.2748	1.8902	0.3653			
			R. Jamb	1.2748	1.8450	0.3606			
			Mullion	2.5496	1.8676	0.3630			
			Sill	1.9627	1.5195	0.3688			

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*
							28.60" by 28.60"	*78.74" by 78.74"*	*184.20" by 184.20"*
10	0.30	53.1	Head	2.2748	1.4102	0.3538	0.7330	0.4642	0.3645
			L. Jamb	1.2748	1.8900	0.3521			
			R. Jamb	1.2748	1.8446	0.3473			
			Mullion	2.5496	1.8673	0.3497			
			Sill	1.9627	1.5196	0.3557			
11	0.28	54.2	Head	2.2748	1.4101	0.3405	0.7214	0.4481	0.3468
			L. Jamb	1.2748	1.8898	0.3387			
			R. Jamb	1.2748	1.8443	0.3338			
			Mullion	2.5496	1.8670	0.3362			
			Sill	1.9627	1.5196	0.3424			
12	0.26	55.2	Head	2.2748	1.4100	0.3273	0.7099	0.4319	0.3294
			L. Jamb	1.2748	1.8908	0.3255			
			R. Jamb	1.2748	1.8454	0.3198			
			Mullion	2.5496	1.8681	0.3226			
			Sill	1.9627	1.5197	0.3293			
13	0.24	56.3	Head	2.2748	1.4098	0.3141	0.6982	0.4157	0.3120
			L. Jamb	1.2748	1.8891	0.3122			
			R. Jamb	1.2748	1.8434	0.3072			
			Mullion	2.5496	1.8663	0.3097			
			Sill	1.9627	1.5197	0.3161			
14	0.22	57.3	Head	2.2748	1.4098	0.3010	0.6866	0.3996	0.2946
			L. Jamb	1.2748	1.8889	0.2990			
			R. Jamb	1.2748	1.8430	0.2939			
			Mullion	2.5496	1.8659	0.2965			
			Sill	1.9627	1.5197	0.3031			
15	0.20	58.4	Head	2.2748	1.4098	0.2879	0.6752	0.3834	0.2769
			L. Jamb	1.2748	1.8888	0.2859			
			R. Jamb	1.2748	1.8428	0.2806			
			Mullion	2.5496	1.8658	0.2832			
			Sill	1.9627	1.5199	0.2900			

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:

Eric Barilar
Simulation Technician

REVIEWED BY:

Kevin S. Louder
Project Engineer

EAB:EAB
B8198.01-116-45

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

Appendix A: Drawings and Bills of Material (10)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
.01 R0	4/2/2012	All	Original Report Issued to US Aluminum

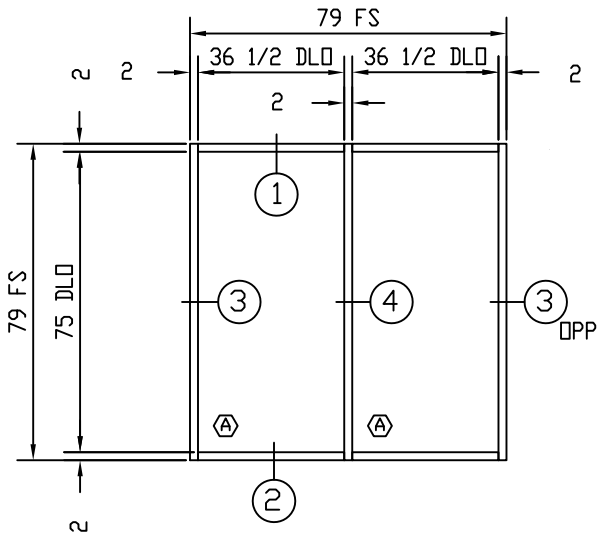
All drawings and Bills of Material used in simulating this product are enclosed in this Appendix.

Appendix A

Architectural Testing

Report #: B8198-116-45
Date: 4/2/2012
Verified by: Eric Bakilas

MU2012-001-01



A

QTY = 1

SYMBOL KEY			
SYMBOL	DESCRIPTION	QTY	COMMENTS
A	37.375 X 75.875	2	1 INS = INSULATED GLASS

REV	REV_DESCRIPTION	DATE	XXX
SYM	REVISION	DATE	BY

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

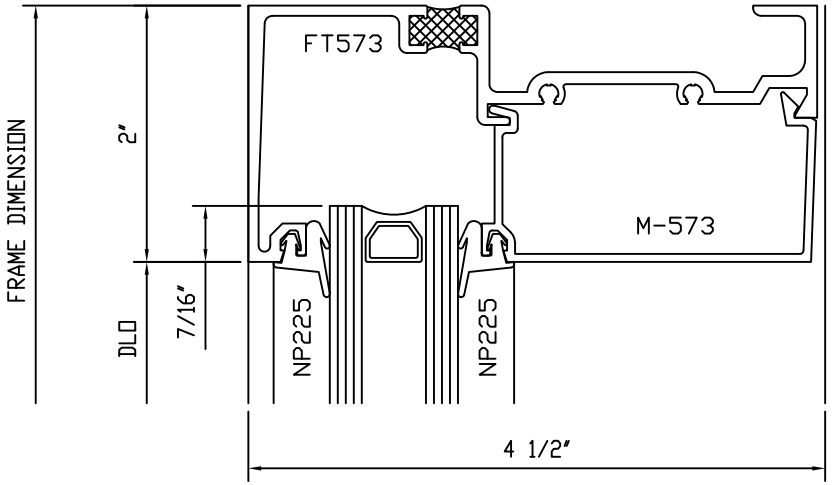
DRWN BY: DCW
DATE: 03.19.12
SCALE: 3/8"=1"

THERMAL_TEST_NFRC_AAMA_1503
SERIES_FT451

DWG NO.
MU2012-001-01

MU2012-001-02

1



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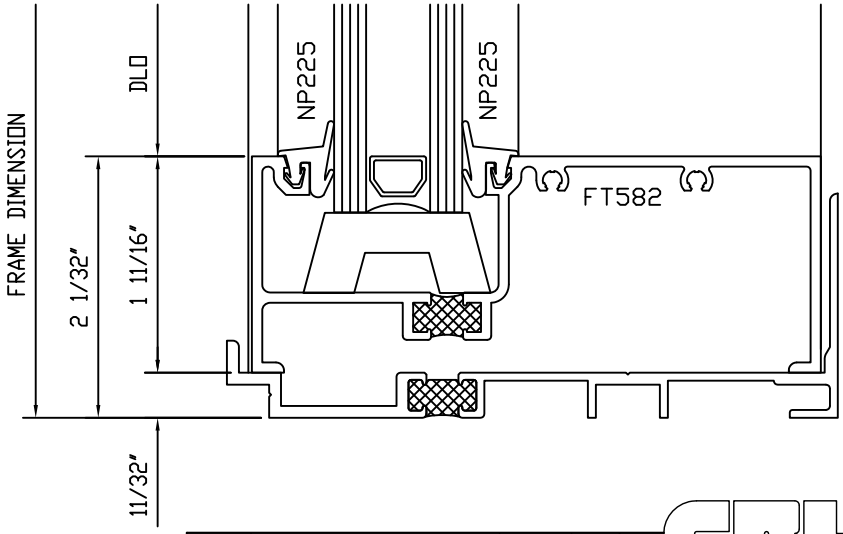


Architectural Testing

Report #: B8198-116-45
Date: 4/2/2012
Verified by: Eric Barilla

REV	REV_DESCRIPTION	DATE	XXX
SYM	REVISION	DATE	BY

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

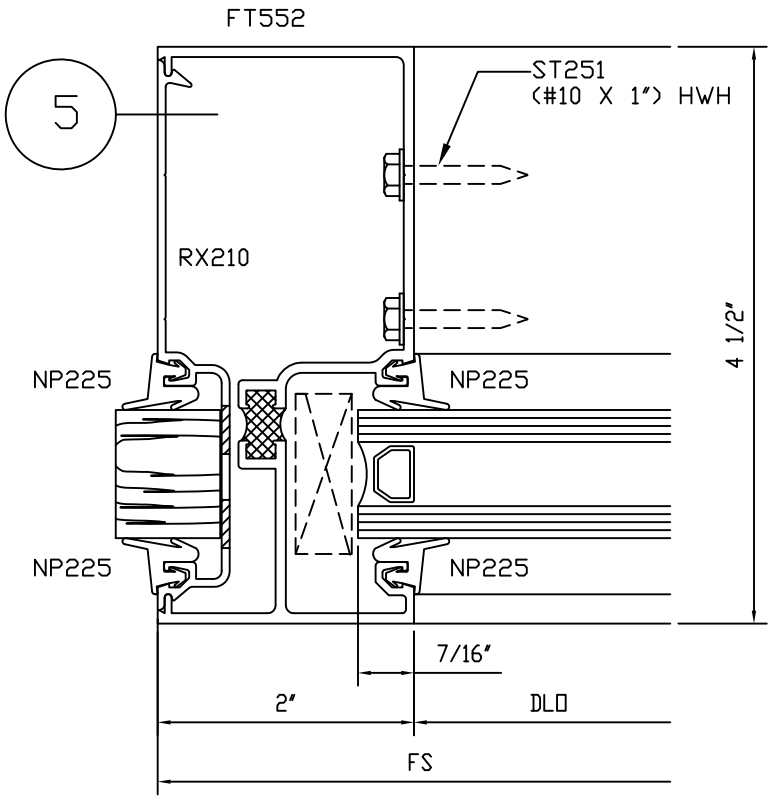
DIVISION UNITED STATES ALUMINUM

DRWN BY: DCW
DATE: 03.19.12
SCALE: FULL

THERMAL_TEST_NFRC_AAMA_1503
SERIES_FT451

DWG NO.
MU2012-001-02

MU2012-001-03



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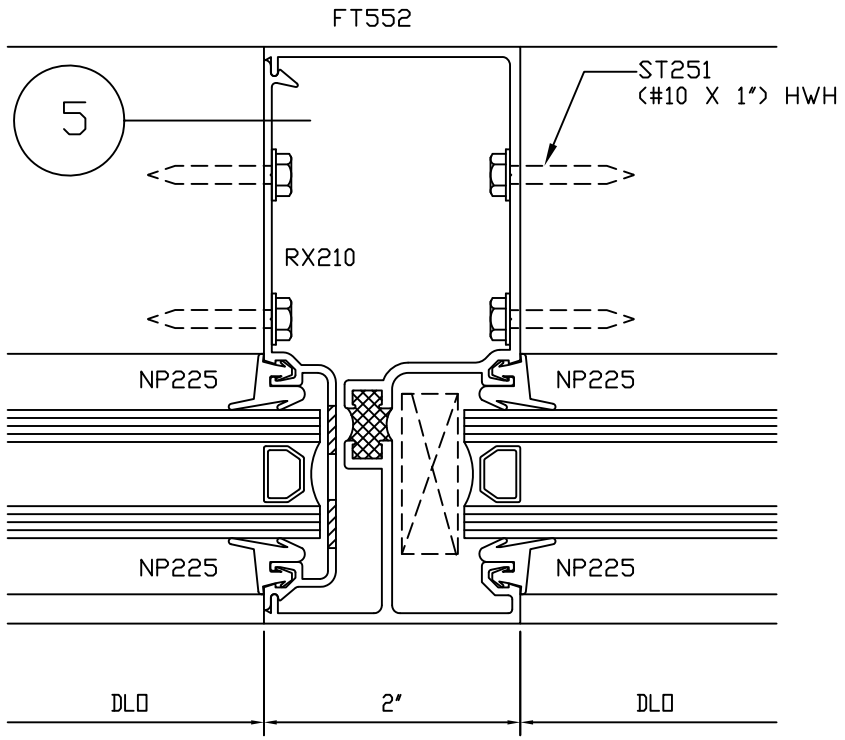


4

Architectural Testing

Report #: B8198-116-45
Date: 4/2/2012
Verified by: Eric Baribeau

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

DRWN BY: DCW
DATE: 03.19.12
SCALE: FULL

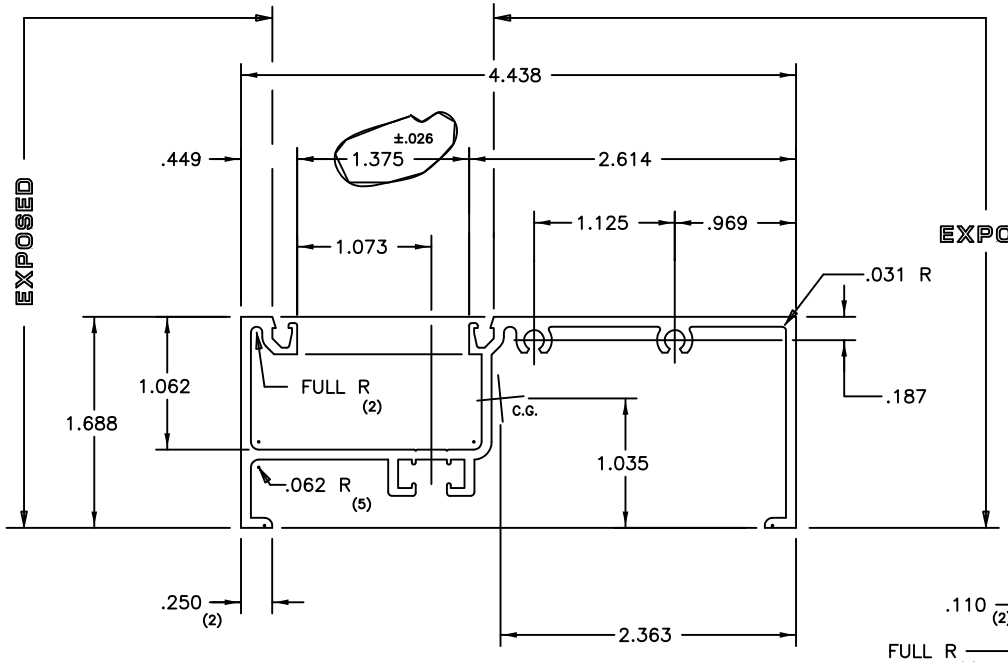
THERMAL_TEST_NFRC_AAMA_1503
SERIES_FT451

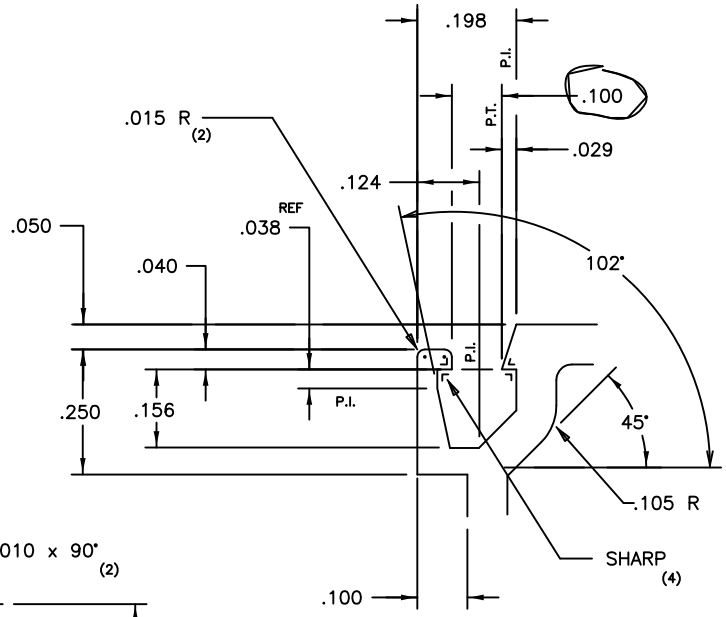
DWG NO.
MU2012-001-03

Architectural Testing

Report #: B8198-116-45
Date: 4/2/2012
Verified by: Eric Bardin

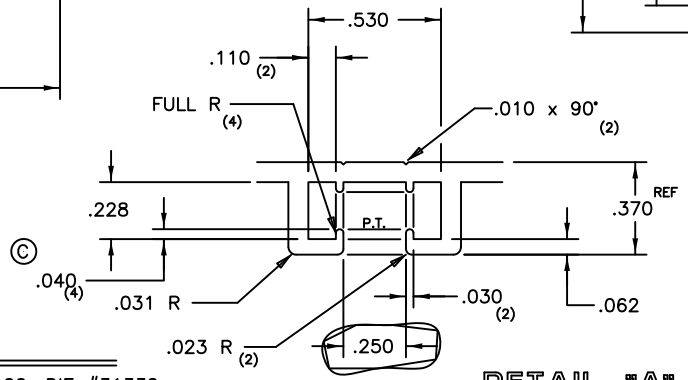
B	SCREWRACE DETAIL REVISED	MM	10/27 93	U.S. ALUMINUM CORP.		T-31362 | C
C	.040 WAS .023, RECALC'D	RT / GH	10/28 97	SILL – INSIDE GLAZE	MAMO	6/21/93
				FF582	FULL SIZE	





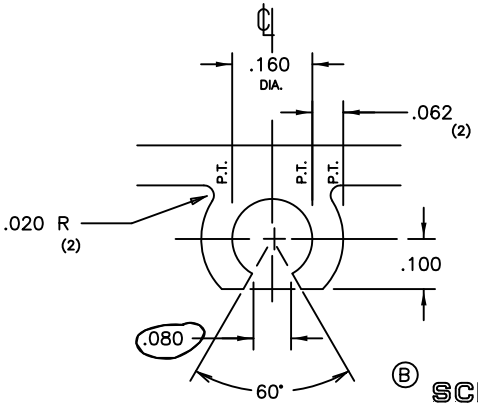
GASKET POCKET DETAIL

SCALE: 4X SIZE (2 PLACES)



DETAIL "A"

SCALE: 2X SIZE



Ⓑ

SCREW RACE DETAIL

SCALE: 4X SIZE (2 PLACES)

NOTES:

1. MATES W/FF400, DIE #31332
2. PAINT PERIMETER: 6.043"
3. Ⓒ THERMO DETAIL AREA: .132; "AA"
4. DEBRIDGE WITH A .218 x .015 MAX PENETRATION INTO THERMO MATERIAL.
5. F & D PART NO. IS FT582

SECTION PROPERTIES:

Ixx = 2.195 in^4
Sxx = 0.929 in^3
Iyy = 0.270 in^4
Syy = 0.261 in^3

10x1 1/2 W/P 10x1 1/4 DIE NO STEP

☒ CA
☒ TX

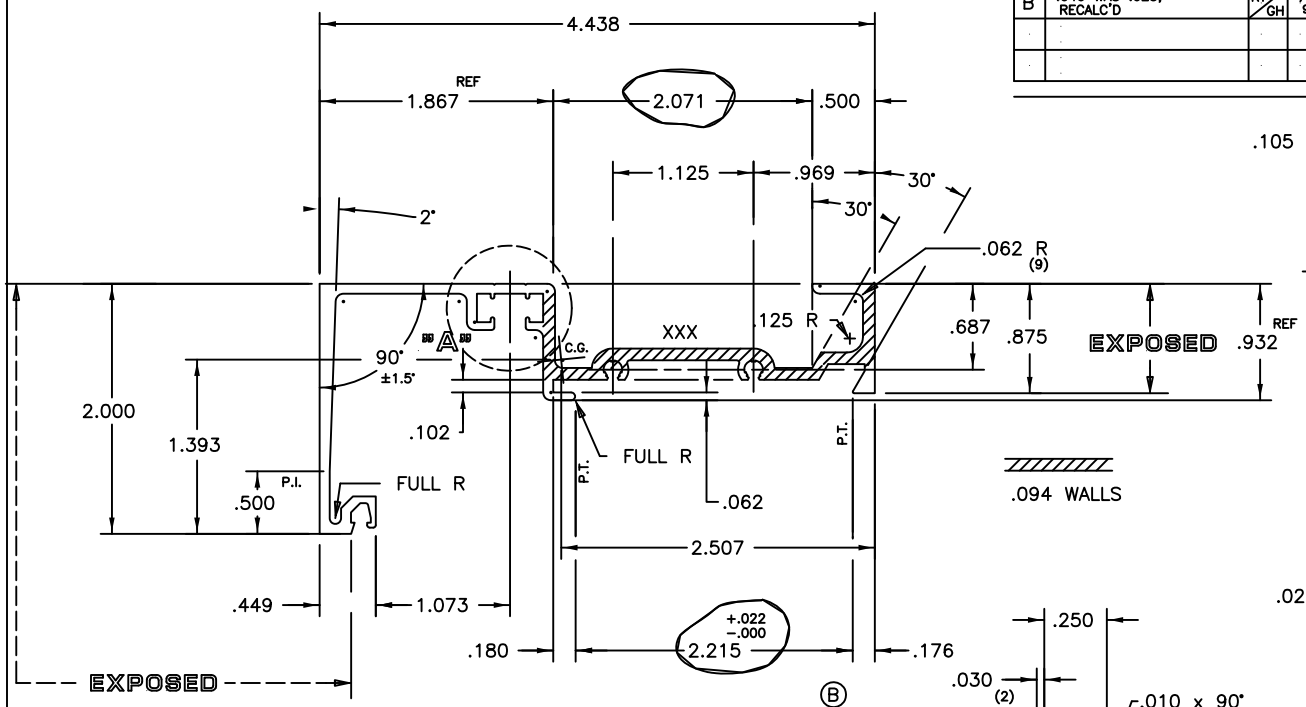
.080

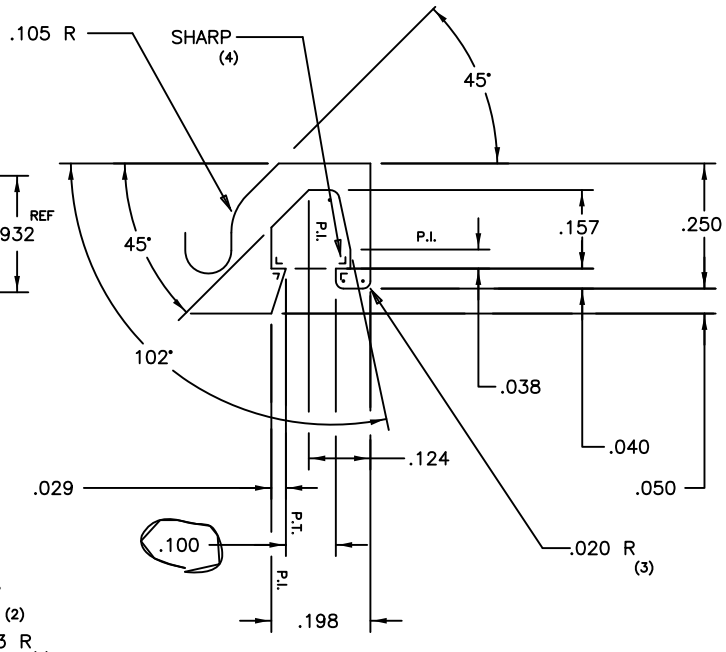
.918 Ⓒ	P-21774	1 / W/P 31362
1.102 Ⓒ	4.800	10x31362
23.515 Ⓒ	SOLID	12x7 1/2 31362
21	8" = 59	T-31362 | C

Architectural Testing

Report #: B8198-116-45
Date: 4/2/2012
Verified by: Eric Bakiba

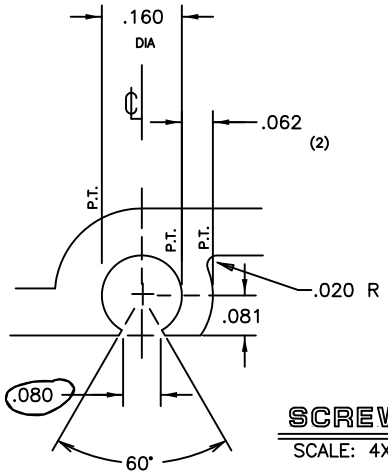
B	.040 WAS .023, RECALC'D	RT/GH	10/30 97	U.S. ALUMINUM CORP.		T-31788 B
				HEAD – 1"	MAMO	8/3/93
				FF573	FULL SIZE	





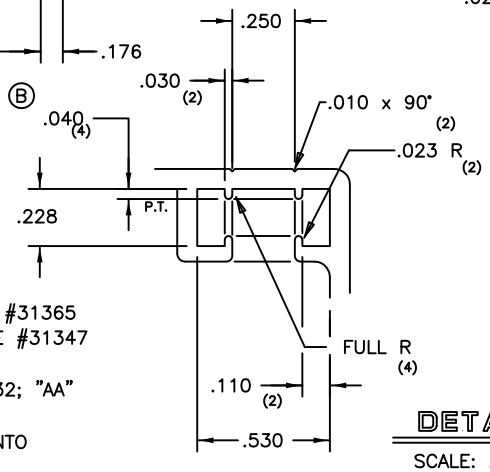
GASKET POCKET DETAIL

SCALE: 4X SIZE



SCREW RACE DETAIL

SCALE: 4X SIZE (2 PLACES)



DETAIL "A"

SCALE: 2X SIZE

NOTES:

1. SNAP-FITS W/M-573; DIE #31365
   ASSEMBLES W/HC201; DIE #31347
2. PAINT PERIMETER: 3.188"
Ⓑ 3. THERMO DETAIL AREA: .132; "AA"
4. DEBRIDGE WITH A .218 x
   .015 MAX PENETRATION INTO
   THERMO MATERIAL.
5. XXX INDICATES I.D. MARK FOR IEC-TX
6. F & D PART NO. IS FT573

SECTION PROPERTIES:

Ixx = 2.259 in^4
Sxx = 0.901 in^3
Iyy = 0.242 in^4
Syy = 0.174 in^3

10x1 1/2 W/P 10x1 1/4 DIE NO STEP

.080

.930 Ⓑ			1 / W/P 31788
1.116 Ⓑ	5.000		10x31359
21.321 Ⓑ	SOLID		12x7 1/2 31359
19	8" = 61		T-31788 B

Architectural Testing

Report #: B8198-116-45
Date: 4/2/2012
Verified by: Eric Barkley

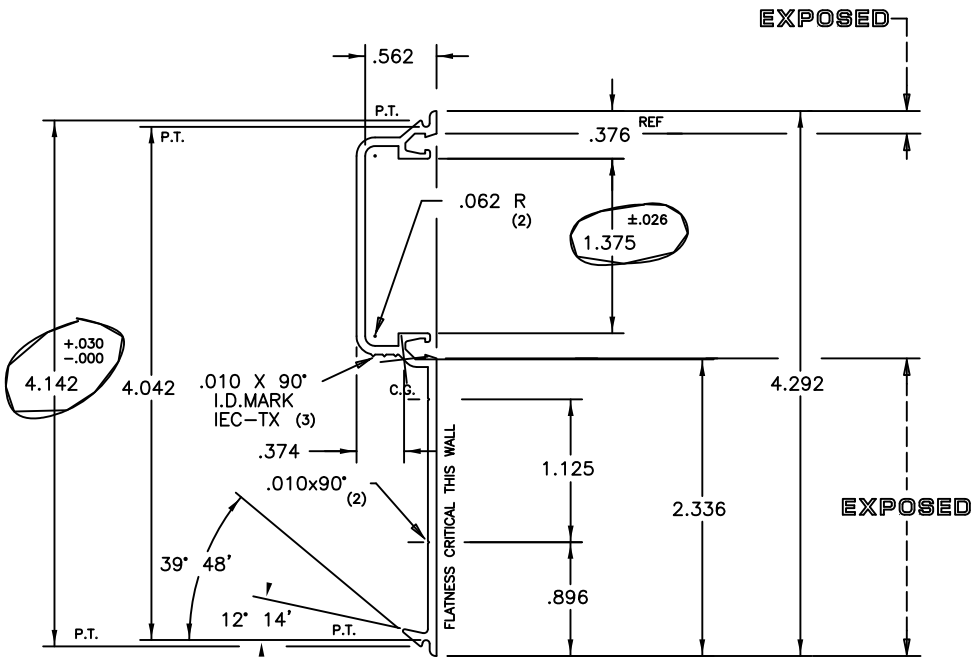
SYM	REVISION	BY	DATE

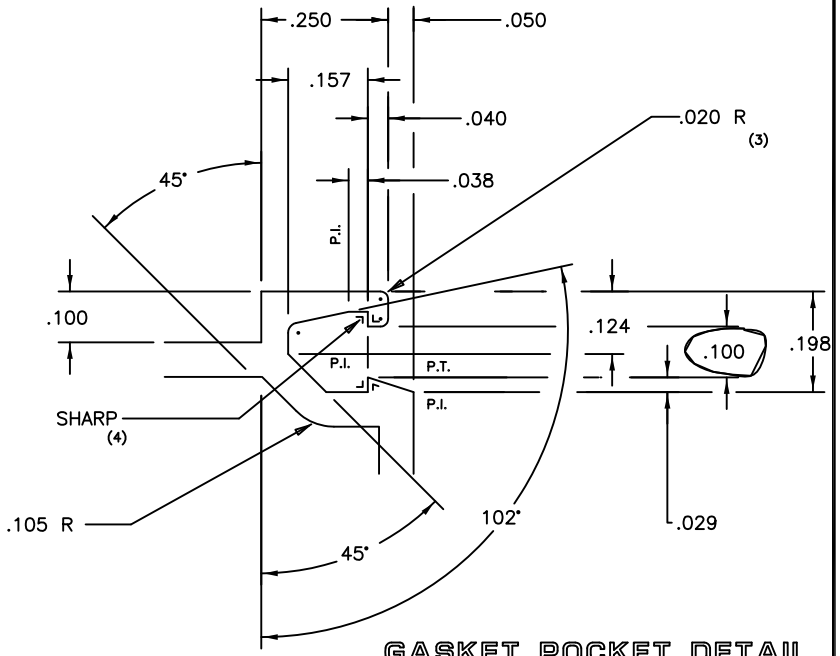
CUSTOMER U.S. ALUMINUM CORP. DIE NO. T-31508 11/18/94

PART NAME INSERT MAMO DRAWN FULL SIZE DATE

PART NO. RF210 SCALE CHKD. APP.

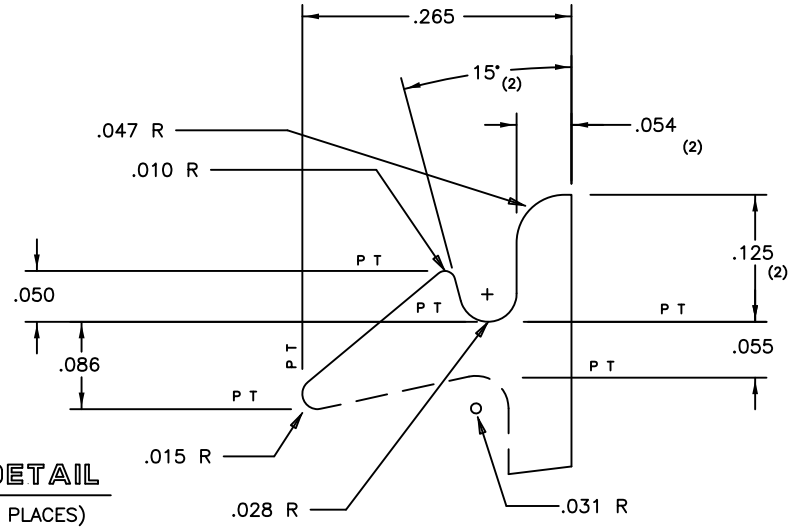
STANDARD TOLERANCES FOR EXTRUDED SHAPES APPLY UNLESS SPECIFICALLY SHOWN OTHERWISE





GASKET POCKET DETAIL

SCALE: 4X SIZE (2 PLACES)



SNAP DETAIL

SCALE: 8X (2 PLACES)

PRODUCT:
PROJECT:

NOTES:

1. SNAP−FITS W/FF552; DIE # 31507
   W/FF551; DIE # 31512

2. PAINT PERIMETER: 2.522"

SECTION PROPERTIES:

Ixx = 0.643 in^4
Sxx = 0.275 in^3
Iyy = 0.023 in^4
Syy = 0.061 in^3

☐ CA
☐ TX

International Extrusion Corporation
202 SINGLETON DRIVE (972) 937−7032 WAXAHACHIE TEXAS 75165

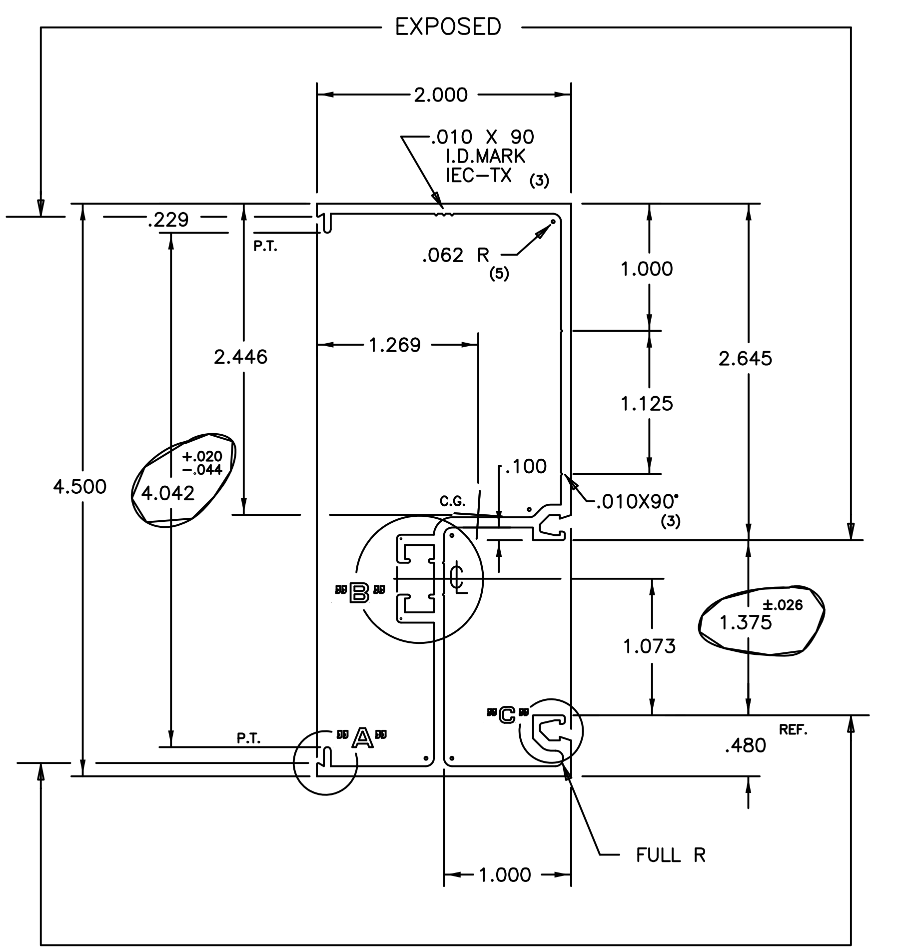
UNLESS OTHERWISE NOTED, ALL CORNERS ARE .015 R, AND TYPICAL WALL THICKNESS IS .068

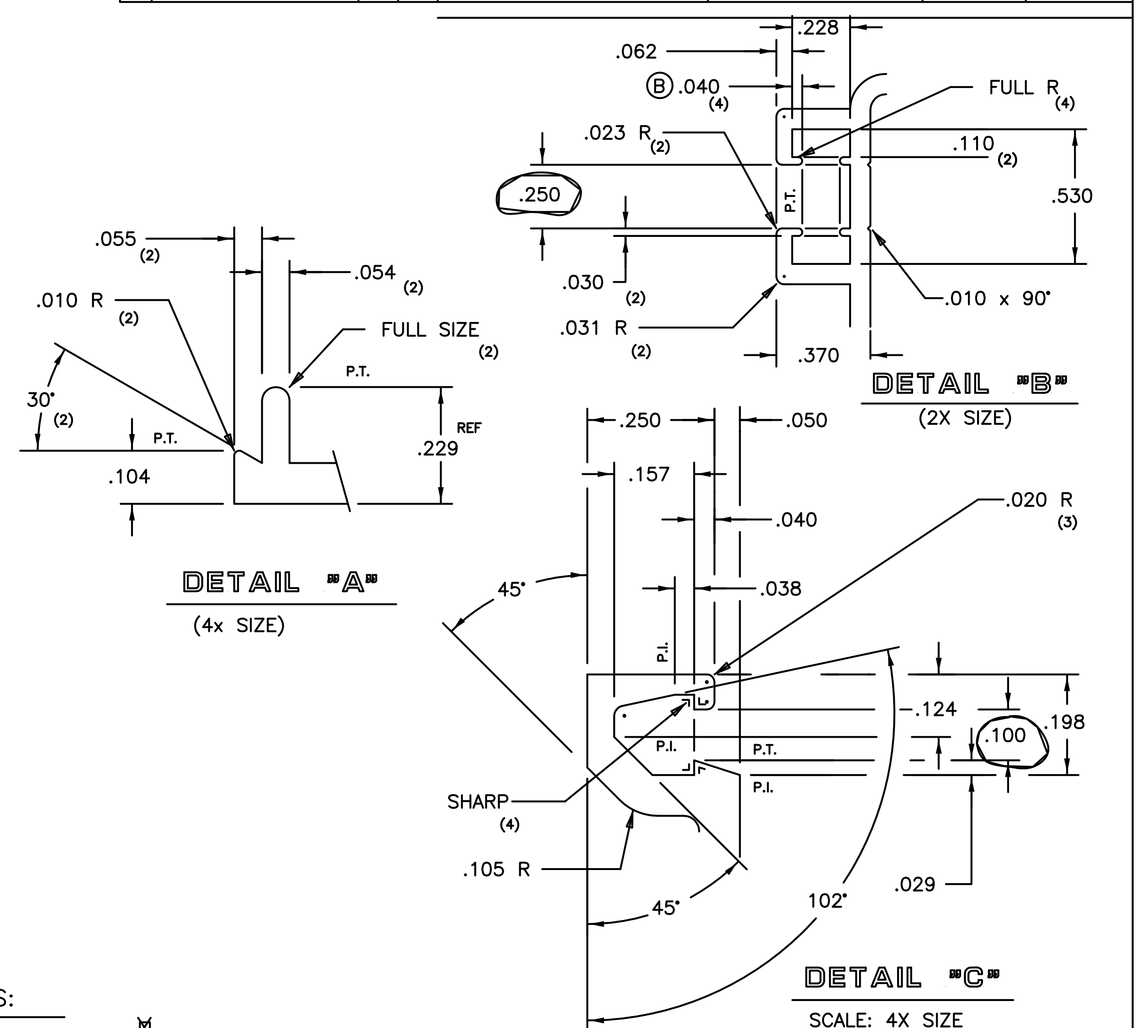
EST. AREA:	.397	US−NO.	P−24052	PORTS	
EST. WT/FT:	.476	CIRCLE SIZE	4.292 IN.	BACKER	
EST. PERI:	12.268	CLASS.	SOLID	BOLSTER.	
FACTOR :	26	ER− " =		DIE NO.	T−31508

Report #:	B8198-116-45
Date:	4/2/2012
Verified by:	Eric Barilla

Architectural Testing

B	.040 WAS .023, RECALC'D	RT/GH	10/30 97	U.S. ALUMINUM CORP.		T-31507 B
				VERT MULL	MAMO	11/18/94
				FF552	FULL SIZE	





NOTES:

1. SNAP-FITS W/RF210; DIE #31508
   W/RF110; DIE #31509
   W/PF100; DIE #31510
2. PAINT PERIMETER: 6.758"
3. (B) THERMO POCKET AREA: .132; "AA"
4. F & D PART NO. IS FT552

SECTION PROPERTIES:

I_{xx} =2.408 in^4
S_{xx} =0.984 in^3
I_{yy} =0.311 in^4
S_{yy} =0.245 in^3

FF451

.080

.897 (B)	P-24046	1	WP31507
1.076 (B)	4.915	10 X 31507	
23.378 (B)	SOLID	31355	
22	8 60	T-31507	B

Architectural Testing

Report #: B8198-116-45
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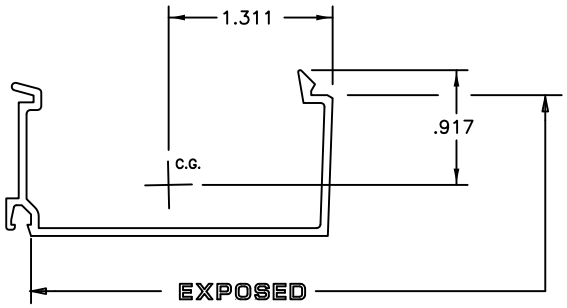
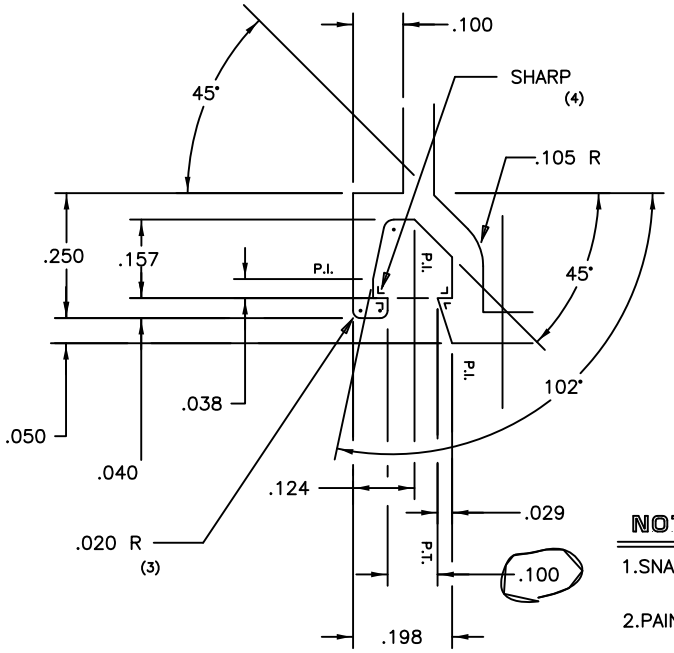
Verified by: Eric Barilla

U.S. ALUMINUM CORP.		T-31365
INT GLS STOP	MAMO	6/21/93
M-573	2x SIZE	

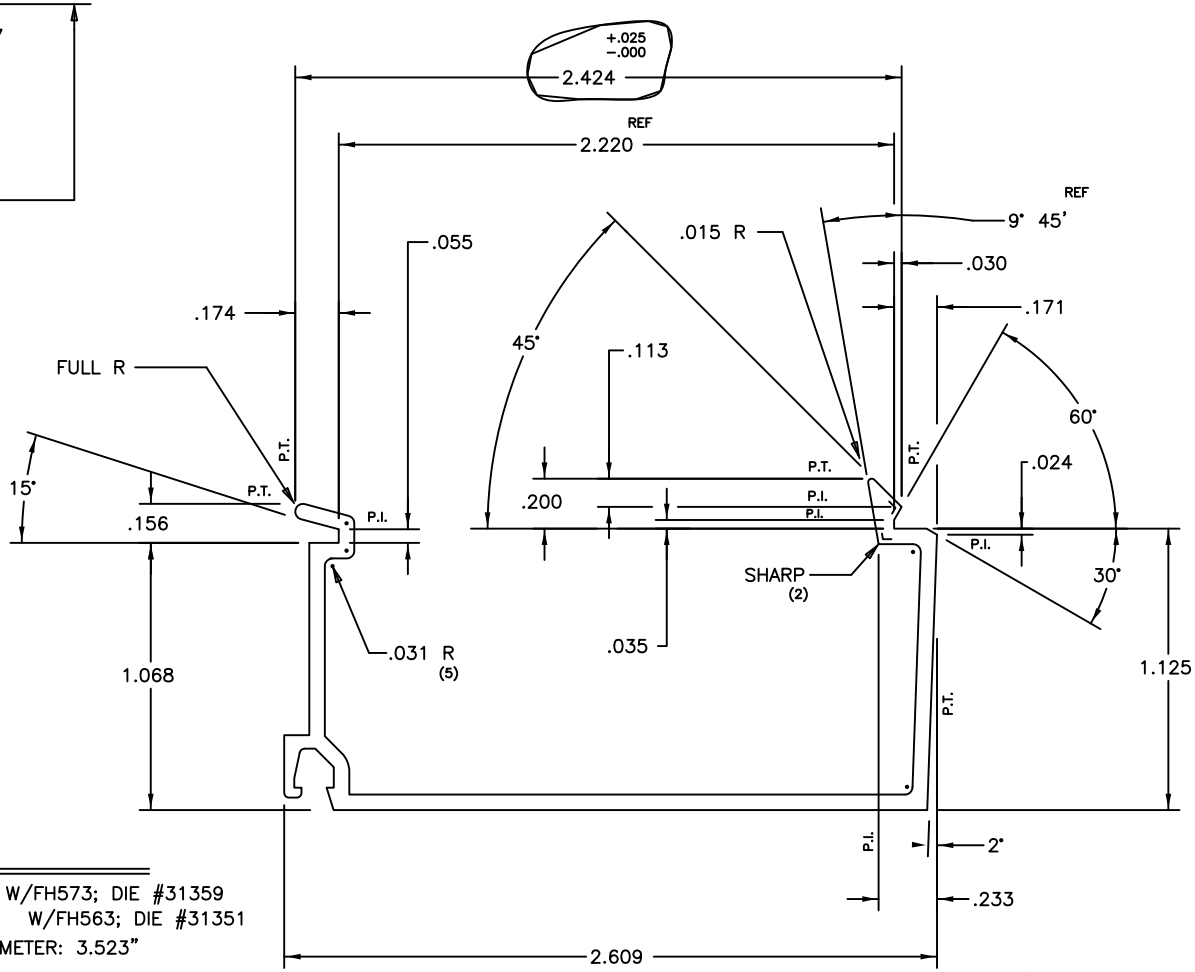


ACTUAL SIZE



GASKET POCKET DETAIL

SCALE: 4X SIZE



NOTES:

1. SNAP-FITS W/FH573; DIE #31359
   W/FH563; DIE #31351
2. PAINT PERIMETER: 3.523"

SECTION PROPERTIES:

Ixx = 0.355 in^4
Sxx = 0.271 in^3
Iyy = 0.066 in^4
Syy = 0.072 in^3

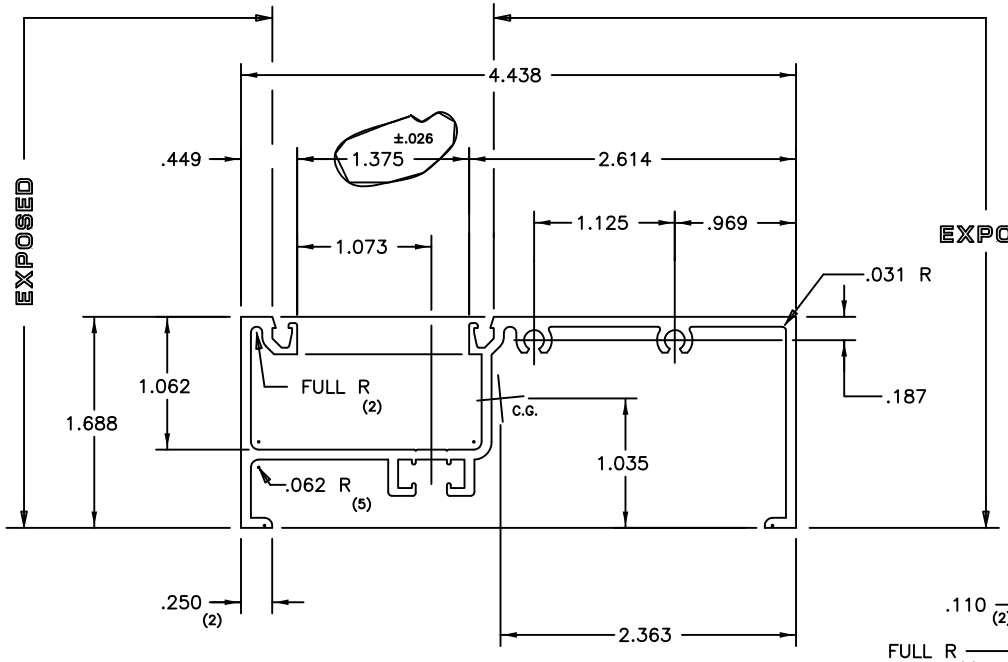
.062

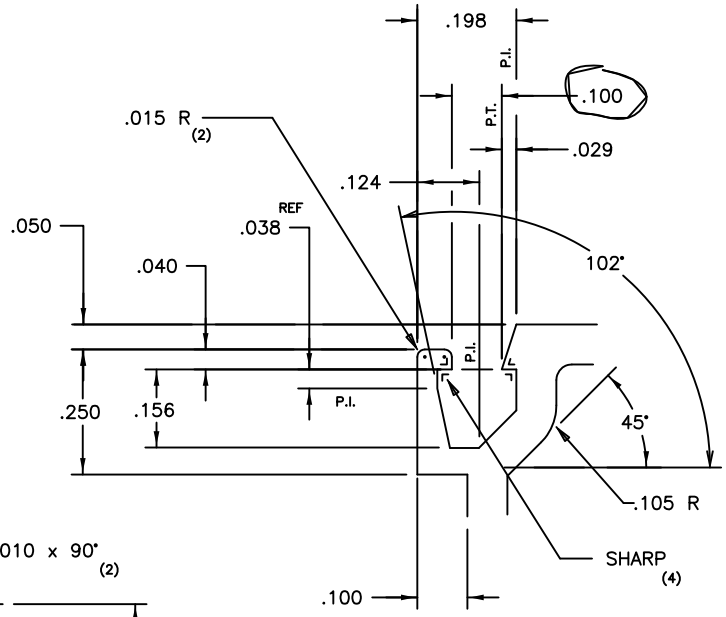
.346	P-21780	
.415	3.500	
11.203	SOLID	
27		T-31365

Architectural Testing

Report #: B8198-116-45
Date: 4/2/2012
Verified by: Eric Baribeau

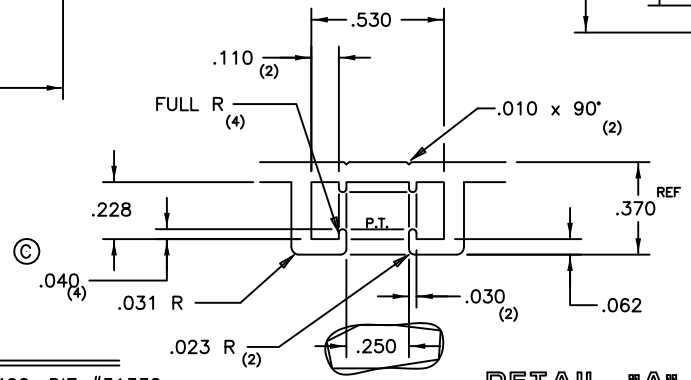
B	SCREWRACE DETAIL REVISED	MM	10/27 93	U.S. ALUMINUM CORP.		T-31362 | C
C	.040 WAS .023, RECALC'D	RT / GH	10/28 97	SILL – INSIDE GLAZE	MAMO	6/21/93
				FF582	FULL SIZE	





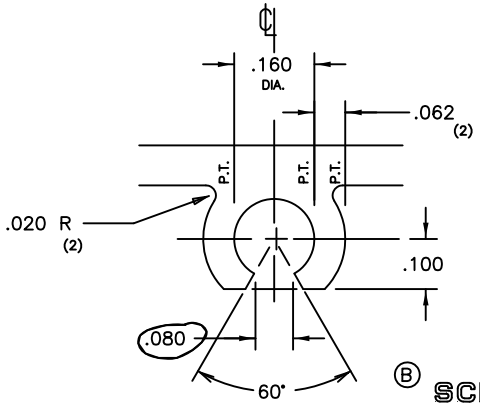
GASKET POCKET DETAIL

SCALE: 4X SIZE (2 PLACES)



DETAIL "A"

SCALE: 2X SIZE



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SCREW RACE DETAIL

SCALE: 4X SIZE (2 PLACES)

NOTES:

1. MATES W/FF400, DIE #31332
2. PAINT PERIMETER: 6.043"
3. Ⓒ THERMO DETAIL AREA: .132; "AA"
4. DEBRIDGE WITH A .218 x .015 MAX PENETRATION INTO THERMO MATERIAL.
5. F & D PART NO. IS FT582

SECTION PROPERTIES:

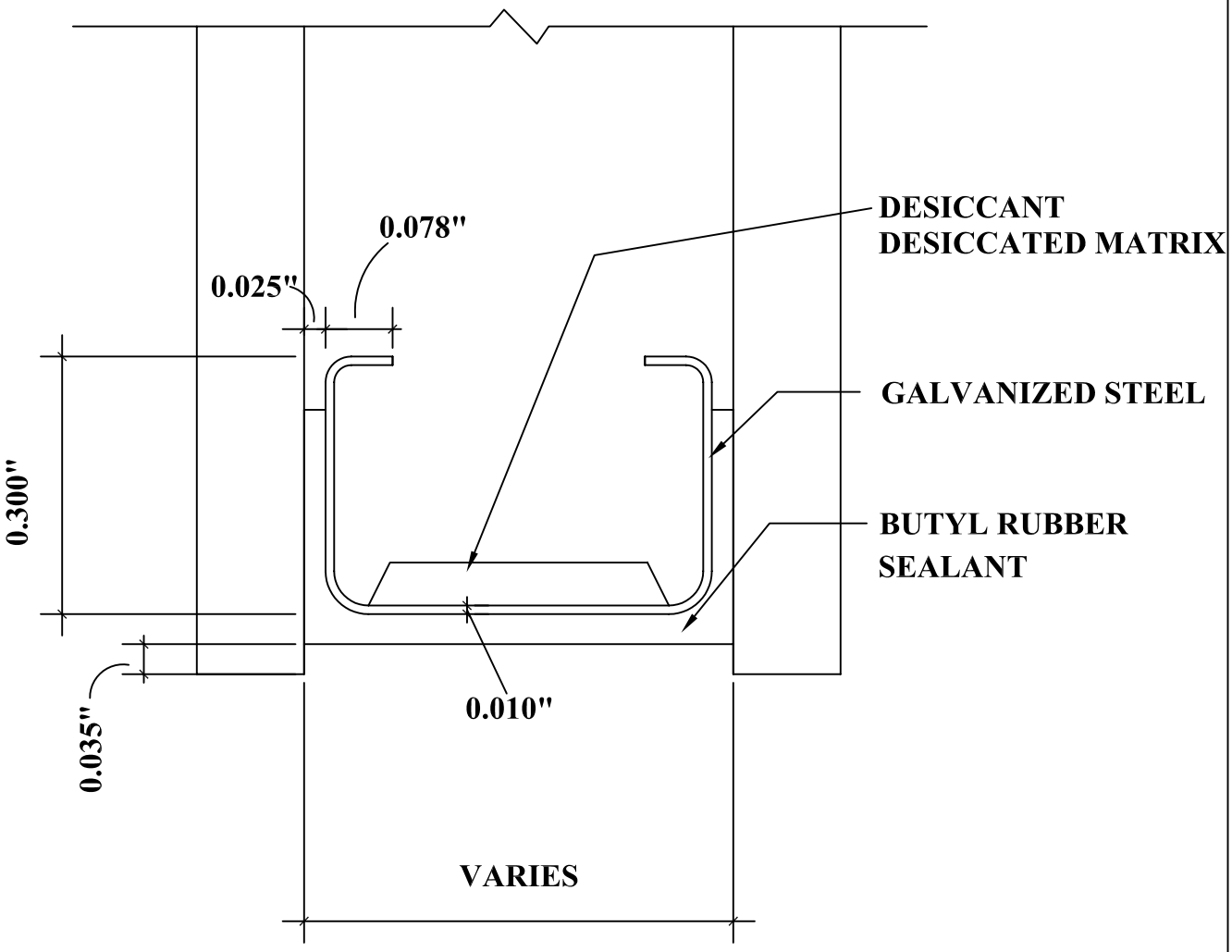
Ixx = 2.195 in^4
Sxx = 0.929 in^3
Iyy = 0.270 in^4
Syy = 0.261 in^3

10x1 1/2 W/P 10x1 1/4 DIE NO STEP

☒ CA
☒ TX

.080

	.918 Ⓒ	P-21774	1 / W/P 31362
	1.102 Ⓒ	4.800	10x31362
	23.515 Ⓒ	SOLID	12x7 1/2 31362
	21	8" = 59	T-31362 | C



DETAIL FOR THERMAL MODELING OF
GED INTERCEPT SPACER - STANDARD (CU-D)